Examining Applications of Earth System Law in Canada's Species at Risk Act

by

Matthew Rygus

A thesis

presented to the University of Waterloo

in fulfillment of the

thesis requirement for the degree of

Master of Environmental Studies

in

Sustainability Management

Waterloo, Ontario, Canada, 2025

© Matthew Rygus 2025

Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

The worsening biodiversity crisis poses urgent questions regarding the capabilities of our legal systems to address ecological issues in the face of increasing human pressures and rapid environmental change. Earth System Law (ESL) is a novel approach to legal regulation that embeds the principles of inclusivity, complexity and interdependency according to an Earth-system perspective into legal systems. Such an approach better accounts for the larger spatial and temporal scales of Earth systems while utilizing a less anthropocentric orientation. To date, ESL research has generally been limited to conceptual analysis, however this study explores the empirical application of ESL by developing an assessment tool that incorporates ESL characteristics. The tool is then used to critically assess Canada's Species at Risk Act (SARA). Drawing on the ESL literature, the study develops detailed criteria which are used to conduct a directed content analysis of a selection (n=sixteen) of SARA documents, consisting of five recovery strategies, five multi-species action plans, five management plans and the SARA legislation itself. The specific ways and extents that SARA, via its instruments, aligns and misaligns with ESL are outlined. Results from the content analysis indicate that SARA exhibits only select ESL characteristics, particularly the meaningful inclusion of present-day beings, the recognition of unknowns in a complex world and the consideration of adaptation and precaution as productive responses to complexity. SARA is misaligned with ESL by working against many of its characteristics, such as the meaningful inclusion of both future humans and geographic areas, complete acceptance of Earth-system complexity, full commitment to adaptation and the acknowledgement of Earth-system interdependencies, outlining an anthropocentric orientation. Overall, the study offers contributions regarding the conceptual

development and real-world application of ESL, the shortfalls of SARA and measures to improve outcomes for biodiversity through legal systems.

Acknowledgements

I would like to acknowledge my supervisor Dr. Neil Craik for his patience and support throughout the completion of this thesis, and the University of Waterloo for giving me the time to complete my degree requirements while working full-time. I would also like to thank my friends and family, my partner Lauren especially, for supporting me as I worked to complete my thesis alongside many other things. Without these people, navigating the chaos of a master's thesis would have been impossible for me. Finally, I would like to acknowledge those contributing to Earth System Governance and Earth System Law discourse and all those who are willing to point out the genuine transformations required to solve sustainability issues and enhance life on Earth. Your efforts inspired this research and continue to inspire me to speak up and drive change no matter the room I find myself in.

Table of Contents

Author's Declaration ii

Abstract iii

Acknowledgements v

List of Figures viii

List of Tables ix

List of Abbreviations x

1 Introduction 1

1.1 Background 1

1.2 Purpose Statement 5

1.3 Research Questions 5

1.4 Scope Clarification 6

1.5 Roadmap 8

2 Literature Review 9

2.1 Introduction 9

2.2 Earth System Law 9

2.2.1 High-Level Description 9

2.2.2 Founded Through ESG 10

2.2.3 Initial Development 12

2.2.4 Focused Conceptual Development 12

2.2.5 Three Foundational Elements 13

2.2.6 Developmental Gaps 15

2.2.7 Critiques 15

2.2.8 Critical Analysis of ESL Literature 17

2.2.9 ESL In Practice 18

2.2.10 Ecocentric and Biocentric Perspectives 19

2.2.11 A Novel Conceptual Framework 22

2.3 Canadian Biodiversity Protection Law 24

2.3.1 Historical Context 24

2.3.2 Current Implementation 26

2.3.3 SARA 27

2.4 Conclusion 30
3 Methods 31
3.1 Overview 31
3.2 Chosen Research Methods 32
3.2.1 Qualitative Approach 32
3.2.2 ESL-Based Assessment Tool 34
3.2.3 Subjects of Analysis 37
3.2.4 Process for Analysis 42
3.2.5 Interpreting and Sharing Results 49
3.3 Reflexivity 50
3.4 Limitations 51
4 Results 53
4.1 Quantitative Results 53
4.2 Qualitative Results 58
4.2.1 Complexity 62
4.2.2 Inclusivity 63
4.2.3 Interdependencies 64
5 Discussion 65
5.1 Introduction 65
5.2 Research Question 2a 66
5.3 Research Question 2b 71
5.4 Research Question 2c 78
5.5 Research Question 4 81
6 Conclusion 84
References 93
Glossary 98
Appendix 99
Codebook 99
Themes From Coded Data 112
Analysis of Coded Data 118

List of Figures

Figure 1. A novel conceptual framework for ESL. 23

List of Tables

Table 1. Adjusted qualitative codes designed to apply ESL. 35
Table 2. SARA documents selected for analysis and their unique characteristics. 38
Table 3. Three examples of how the study's qualitative coding was executed. 43
Table 4. Coding results for the ten Complexity codes. 55
Table 5. Coding results for the nine Inclusivity codes. 56
Table 6. Coding results for the five Interdependencies codes. 57

List of Abbreviations

CBD – Convention on Biological Diversity

ESG - Earth System Governance

ESL – Earth System Law

MSAP – Multi-species Action Plan

RS+AP – Recovery Strategy and its corresponding Action Plan

SARA – Species at Risk Act

1 Introduction

1.1 Background

The worsening biodiversity crisis in the context of an increasingly human-dominated world poses urgent questions regarding the capabilities of our legal systems.

Non-human species around the world are facing greater risks and rates of extinction, largely due to human-driven habitat loss, overexploitation, climate change, invasions of non-native species and pollution (Di Marco et al., 2014; Dirzo et al., 2014; Favaro et al., 2014; IPBES, 2019; Pelletier & Coltman, 2018). This brings into question our valuations of these species and the extent of our desire to protect them. Various perspectives exist regarding the value of biodiversity. Those taking an anthropocentric approach focus on the contributions of non-human species to human individuals, societies and economies as consumable resources. In contrast, those supporting ecocentric and biocentric approaches recognize the value of non-human species beyond what they provide for humans, focusing instead on their role in natural ecosystems and their intrinsic value as living beings, respectively (these approaches are described further in the literature review) (Van Uhm, 2018). Impacts to non-human species carry forward negative impacts to both natural ecosystems and humans given the complex interdependent relationships that exist all throughout nature, including the inherent dependency humans have on ecosystem services (Favaro et al., 2014; Stokes, 2018). Therefore, regardless of how a person assigns value to non-human species (if at all), there is a definitive need for humans to protect them via limiting human-driven impacts including those mentioned above.

Legal systems lie at the heart of this task, as they are authoritative institutions for managing sustainability issues given their ability to establish norms, defend collective values and guide behaviors to maintain order while the world we inhabit changes (Kotze & Kim, 2019; Kotze & Kim, 2020). To date, there has been extensive multi-scale participation by legal systems regarding the biodiversity crisis, from the international Convention on Biological Diversity to national endangered species laws to local conservation laws both formal and informal. Canada, for example, has approximately 201 laws that speak to biodiversity protection in some capacity (Ray et al., 2021).

Despite such efforts, the biodiversity crisis has only grown in severity alongside its human-based drivers, in Canada and globally (Favaro et al., 2014; IPBES, 2019; Ray et al., 2021; Wyatt, 2021). This undermines the actions and foundations of our legal systems, necessitating both the analysis on the shortfalls of these systems and the establishment of more productive pathways forward. To this end, such analyses have produced two key takeaways: 1) poor integration across legal frameworks, the continued desire to exploit natural resources, inadequate responses to changing conditions on Earth and an overarching human bias are some of the major sources of legal shortfalls surrounding biodiversity protection and sustainability in general, and 2) legal systems need to undergo transformations (rather than simple adjustments) in various forms to foster more sustainable outcomes (Mawdsley et al., 2009; Kotze, 2020; Roe et al., 2020; Ray et al., 2021; Sol, 2018; Swerdfager & Olive, 2023).

To summarize this failure, legal systems are not adequately responding to the conditions of the Anthropocene (most notably the increasing overlap between human and natural

systems), due in part to these systems being driven by human-centered perspectives while supporting the dichotomy of humans and nature (Kotze & Kim, 2019). We are living in a world where humans and nature are interconnected and the decisions made by and for humans have significant impacts on the rest of the planet. Meanwhile, our legal systems operate as though we can continue to grow and develop our human societies while preserving nature as it was during previous periods on Earth (when humans were less dominant) (Kotze & Kim, 2019). They are not designed to observe and respond to the complex nature of Earth's systems, and preserving these systems means changing our approach to one that simultaneously and equitably oversees humans, ecosystems and non-human species, including their interdependent relationships with one another (Kotze & Kim, 2019). Ultimately, these shortcomings prevent legal systems as currently structured from addressing complex global issues like the biodiversity crisis and suggests the need for radical legal transformations that truly foster sustainable outcomes.

Earth System Law (ESL), a conceptual framework under the umbrella concept of Earth System Governance (ESG) (described later in the literature review), has the potential to initiate and guide these legal system transformations through its utilization of an earth system perspective. This involves designating planet Earth as the object of law and ensuring its well-being by enhancing the ability of legal institutions to holistically respond to the complexities, uncertainties and interdependent relationships operating within the Anthropocene (Kotze & Kim, 2019; Kotze, 2020). Notably, ESL also incorporates ecocentric and biocentric perspectives by recognizing the value of non-human species beyond their human-focused contributions. Thus, ESL rejects the common notion that humans are the most important species on Earth,

extends the meaning of justice to include all non-human species and gives more attention to biodiversity protection according to “an ethical obligation to address Earth system vulnerability in its widest sense” (Kotze, 2020). Given the inability of current legal systems to properly manage the biodiversity crisis in the Anthropocene, ESL provides a promising pathway forward through its principles and characteristics that aim to unite humans and nature and support all beings from a planetary perspective. However, ESL is a young concept, and its real-world application has received limited attention from researchers, including how exactly to apply an ESL perspective to elements of today’s legal systems (such as legal text) as well as ESL’s implications for biodiversity protection law specifically.

Canada makes an interesting site to conduct such research. On one hand, Canada has extensive and diverse land and marine areas available as habitat as well as a clear commitment to protecting biodiversity given its lasting membership with the Party to the Convention on Biological Diversity. In contrast, its decentralized approach to governing land and natural resources presents barriers for federal-level actions designed to meet international treaty obligations, complicating the nation’s ability to effectively tackle the biodiversity crisis (Ray et al., 2021). Using Canadian federal biodiversity protection law to explore the real-world application of an ESL perspective and ESL’s implications for biodiversity protection law could generate useful findings by evaluating the nation’s biodiversity protection capabilities in light of its context.

1.2 Purpose Statement

The purpose of this qualitative study is to explore both the real-world application of an ESL perspective and the implications of ESL on biodiversity protection law in Canada through a directed content analysis of Canada's Species at Risk Act (SARA). For this study, the implications of ESL are defined as the critiques of SARA and suggested improvements for biodiversity protection law offered by an ESL perspective.

1.3 Research Questions

Accordingly, this study asks the following as its central research questions:

1. How can an ESL perspective be applied to legal text, a key element of today's legal systems?

   a. Can a legal assessment tool be built that uses ESL as a conceptual foundation to evaluate biodiversity protection law in Canada?
2. What are the implications of ESL for biodiversity protection law, revealed by a directed content analysis of SARA's legislation and instruments for implementation?

   a. To what extent does SARA exhibit principles and characteristics of ESL?

   b. In what ways does SARA contradict principles and characteristics of ESL?

   c. What measures could be taken to better incorporate ESL principles and characteristics into biodiversity protection law?

Further, the following sub-questions have been established:

3. Can ESL be considered practical for or effective at critically assessing biodiversity protection law?

4. How do the ecocentric and biocentric approaches to valuing non-human species play a role in ESL's application towards SARA?

5. How does this study contribute to the overall development and application of ESL as a conceptual framework?

6. What insights does this study offer regarding Canada's decentralized structure for governing land and natural resources?

Research questions 2 and 4 will be addressed primarily in the Discussion section, while research questions 1, 3, 5 and 6 will be addressed in the Conclusion section.

1.4 Scope Clarification

At the highest level, this study focuses on addressing the biodiversity crisis, a major global sustainability issue that is being worsened to this day. The study refines its focus by considering only the role of legal systems in addressing the biodiversity crisis, specifically whether legal systems can better support natural systems through a more biocentric and ecocentric approach. Earth System Law (ESL), through the earth system perspective, offers a unique way of perceiving the world and suggests that using this perspective will transform legal systems (by changing how we structure and implement them). Through this transformation that would ultimately integrate a more biocentric and ecocentric approach into legal systems, global sustainability issues can be adequately addressed from a legal standpoint. With this, ESL

provides a clear focus for this research that avoids overly broad or specific explorations unsuitable for a master's thesis.

Regarding this study's scope for exploring ESL, a review of ESL literature outlined two key points: 1) ESL has established its theoretical foundations but lacks clarity for real-world implementation, and 2) the ESL perspective may be well-defined, but there's been limited exploration of its practical application. The study's scope was refined further to address the gap outlined by the second key point. Specifically, the study will explore the practical application of an ESL perspective by using it to critically assess legal text related to biodiversity protection. This approach aligns with the higher-level scope outlined above as well as the workload of a master's thesis. It also emphasizes the importance of legal text as a component of legal systems and directly tackles research gaps surrounding ESL and legally addressing the biodiversity crisis.

With the study's scope already narrowed, the study's methods were established such that ESL literature would be used to build a list of qualitative codes that resemble an ESL perspective, and these codes would be used to qualitatively analyze (via directed content analysis) a selected volume of relevant legal text. For this study, Canada's Species At Risk Act (SARA) was the only source of legal text selected for analysis due to its relevance to biodiversity protection, the author's familiarity with the Canadian context and the known restraints of a master's thesis. With this, few other (Canadian) biodiversity protection laws are named in this paper and none other than SARA are described. Sixteen SARA documents were selected to enable the analysis of a variety of contexts (with respect to different species, types of species, types of ecosystems and regions of Canada), also ensuring that enough elements of SARA are analyzed without making the analysis too large of an endeavor. When selecting these

documents, those pertaining to marine mammals, birds, fish (freshwater or marine), molluscs, vascular plants, lichens or mosses were excluded to streamline the selection process and exclude species whose federal legal protection offered by SARA is limited relative to other laws such as the Fisheries Act.

In summary, this study applies an ESL perspective to critically assess SARA, a Canadian biodiversity protection law, aiming to contribute to research on legal transformations necessary to address the biodiversity crisis. Any limitations from the narrowed scope are reasonable for a master's thesis and do not diminish the rigor or impact of the research itself.

1.5 Roadmap

This thesis is organized into eight sections. Section 2 includes a literature review that covers the theoretical foundations and exploration of ESL to date, ecocentric and biocentric perspectives including their relation to ESL and context regarding Canadian biodiversity protection law with a focus on SARA. Section 3 describes the methodology, including the development of an ESL-based legal assessment tool, the qualitative directed content analysis applied to sixteen SARA documents, the author's reflexivity and notable limitations. Section 4 outlines the study's results while Section 5 discusses the results to address Research Questions 2 and 4. Section 6 provides the conclusion, summarizing key takeaways and recommendations while addressing Research Questions 1, 3, 5 and 6. Following the conclusion, there are listed references, a glossary and supporting materials provided.

2 Literature Review

2.1 Introduction

The purpose of this literature review was to gain a comprehensive understanding of ESL, ecocentric and biocentric valuations of non-human species and both the foundations and inner workings of Canadian biodiversity protection law with special attention given to SARA. In particular, the literature review looked at the history, principles, characteristics, critiques and applications of ESL. Next, it explored the respective meanings and increasing prominence of the ecocentric and biocentric valuations of non-human species as well as their relevance to ESL. Finally, it reviewed the history, characteristics and critiques of Canada's framework for biodiversity protection law including an extensive description of SARA. Major findings from the review include the three foundational elements of ESL (inclusivity, interdependencies and complexity), the deeply embedded presence of ecocentric and biocentric perspectives within ESL and both the historical context and present-day outcomes associated with SARA. These major findings and the literature review in general guided the study's qualitative coding including the development of the codes themselves.

The literature review is divided into two segments: 1) earth system law and ecocentric and biocentric perspectives, and 2) Canadian biodiversity protection law. Each segment has its own group of subheadings for organizational purposes.

2.2 Earth System Law

2.2.1 High-Level Description

In the Introduction section, ESL was described as a novel approach to legal regulation, a conceptual framework, a relatively young concept and an approach to transform legal systems.

In truth, ESL is all of these things, but above all else it is a particular way to imagine legal systems (ESG, 2022; Kotze & Kim, 2023). Legal systems and their laws are not an inherent part of the reality on Earth like water or air, but are imagined by humans and only experienced in reality because of a continuously-maintained choice collectively made by humans. Further, the particular way they are imagined by humans defines how they are experienced in reality (a legal system's overarching values, beliefs, structure and processes, and consequently its actions and their outcomes). With this, ESL is a new way to imagine legal systems that differs from those historically and currently utilized as it is structured according to an earth system perspective. ESL conceptualizes legal systems where the primary objective is to ensure present and future circumstances across the planet are preferable for all beings of the earth system and thus the Earth itself (ESG, 2022). By using ESL to imagine legal systems differently, these systems can be experienced differently in reality in that they would acknowledge and productively respond to the various realities of a complex earth system marked by the Anthropocene. Through this, legal systems are made capable of truly addressing the global sustainability issues (such as the biodiversity crisis) we face today to achieve long-term sustainability for the planet and all its inhabitants (ESG, 2022; Kotze & Kim, 2023). In summary, ESL is about reimagining legal systems with an earth system perspective so that these systems are transformed in a manner conducive to meaningfully addressing the biodiversity crisis and other global sustainability issues.

2.2.2 Founded Through ESG

While ESL is the primary focus of this study, it remains a subtopic of ESG and is therefore linked to ESG's foundational principles and objectives. Thus, it is important to understand the conceptual development and advancement of ESG to better understand ESL.

ESG was coined by Frank Biermann in a research article published in 2007. In it, Biermann (2007) spoke of developing ESG as a well-defined framework for governance that could be accepted and used by natural and social scientists alike to better manage our planet. ESG operates under the belief that we now live in an epoch defined by human dominance on Earth to the extent where humans have significant ability to manipulate the world they inhabit (often referred to as the Anthropocene). To ensure responsible management of the world in a time as unprecedented as the Anthropocene, Biermann (2007) conceptualized ESG as an interdisciplinary bridge between holistic understandings of the Earth and the development of methods for multi-scale governance, guided by four core principles: credibility, stability, adaptiveness and inclusiveness. To mark a way forward for other researchers (and themselves) to develop ESG further, Biermann (2007) outlined five aspects of ESG research: architecture, agency, adaptiveness, accountability and allocation. With this, Biermann (2007) did well to outline ESG's foundational structure and clarify its objectives.

In a 2018 article on ESG, Biermann argues that environmental policy is no longer reflective of current experiences or challenges being faced in the Anthropocene (Biermann, 2018). This is also a foundational perspective within studies that embrace and discuss ESL. Biermann (2018) added that ESG rejects the notion that humans exist separately from nature and instead views the Earth as an interconnected system, thus connecting ESG to what's known as the earth system perspective, which is considered foundational to ESL as well (Kotze & French, 2018; Kotze, 2019; Kotze & Kim, 2019).

Since its establishment, ESG has developed into a full-fledged project with a dedicated website, research journal, implementation plan and multiple research centers around the world

that house hundreds of researchers assigned to various task forces and subtopics (including ESL). One could say that ESG today describes a movement, led by experts of various disciplines, to reimagine our ways of governing in a manner that truly supports all life on Earth. The key now is to ensure that ESG, including its subtopics and various task forces such as ESL, takes steps beyond academia to be implemented through real-world applications.

2.2.3 Initial Development

Moving on from ESG but building on its foundations, the concept of ESL was introduced in a 2018 article by Kotze and French (though similar, albeit less-developed, concepts such as Earth Jurisprudence have been discussed prior (Koons, 2012)) that critiqued global efforts to govern the environment. Notably, Kotze and French (2018) observed the following: 1) legal efforts to protect the environment should utilize the earth system perspective, 2) the earth system perspective goes beyond environmental concerns to address concerns of the planet that connects all who inhabit it via complex interdependent relationships and 3) ESL, as a new approach for legally protecting the environment, embraces the earth system perspective along with institutionalized elements of global democracy and the rights of nature. These takeaways from Kotze and French (2018) ultimately defined ESL's purpose as well as many of its characteristics, and inspired further ESL research.

2.2.4 Focused Conceptual Development

Common themes included outlining the shortfalls of environmental law in its management of sustainability issues and Anthropocene conditions more generally, and the subsequent need for a transformative approach to legal systems that replaces their perspectives with more holistic and systematic views (in line with the earth system perspective)

(Kotze, 2019; Kotze & Kim, 2019; Kotze, 2020; Kotze & Kim, 2020; Kotze & Kim, 2021). With ESL acting as this transformative approach, its global application would theoretically look like diminishing the value of man-made borderlines and the interests of individual nations while incorporating strong considerations for inclusivity, interdependencies and complexity on a planetary level (Kotze, 2019).

These three considerations incorporated by ESL can be referred to as ESL's foundational elements. Each element's respective details collectively form the bulk of ESL's framework and ultimately guide its structural, normative and transformative dimensions. Through these elements, ESL can transform current legal systems for the purpose of more sustainably responding to the Anthropocene, preventing the crossing of planetary boundaries (Kim & Kotze, 2021; Kotze & Kim, 2020).

2.2.5 Three Foundational Elements

Regarding inclusivity, Kotze (2019; 2020) along with Kotze and Kim (2019; 2020; 2021) made it clear that ESL must utilize government bodies and their powers but also expand the scope of law to include more perspectives in legal decision-making processes, granting more legal power to all beings across our global society. Further, ESL should expand the scope of justice in legal systems to better address imbalances between rich and poor people, present and future generations of life on Earth and humans versus non-human species (Kotze, 2020; Kotze & Kim, 2020; Kim, 2021; Pope et al., 2021). With this, ESL needs to replace the anthropocentric norms reinforced by environmental law with norms that reflect the radical but more productive and sustainable belief that humans are equal with those they share a planet with (Kotze & Kim, 2021). In summary, ESL aims to promote the inclusion of marginalized

humans, future generations of life and all non-human species with respect to legal decision-making and the pursuit of justice. Doing so would enhance the ability of legal systems to foster equitable and sustainable outcomes, equalizing the benefits and costs that are currently distributed unequally around the world (Kim, 2021).

Regarding interdependencies, literature (both ESL-specific and otherwise) characterizes the Anthropocene as a time where Earth's elements including human societies and natural ecosystems are clearly interdependent on one another at various scales (Kotze, 2019; Kotze 2020; Nitzbon et al., 2017). Such interdependencies inherently reflect the well-being of all participants, so addressing them through our legal systems is arguably imperative to maintaining the well-being of all life on Earth. ESL literature states that current legal systems fail to do this, and that ESL would better address the interdependent relationships on Earth through an earth system perspective that devotes attention to all interdependencies that contribute to the sustaining of the planet (Kotze 2019; Kotze 2020).

With regards to complexity, the Anthropocene (as described in literature) presents the notion that Earth is a complex system capable of undergoing changes that cannot always be understood or predicted with a high degree of certainty (Kotze, 2019; Kotze, 2020). As all life on Earth will continue to be subjected to changes paired with varying degrees of uncertainty, it is necessary to strengthen our ability to mitigate, adapt and be resilient in the face of these changes (Kotze, 2020). Much like ESG and its core principle of adaptiveness, ESL embraces a world exhibiting unpredictability and complexity, using the earth system perspective and its global scale of interdisciplinary systems-thinking to formulate effective responses to Earth's

changes (Kim & Kotze, 2020; Kotze, 2020). Thus, ESL seeks to respond to complexity in the Anthropocene in a manner that current legal systems do not.

Taken together, ESL's three foundational elements (and its entire conceptual development) present ESL as a potential answer to the shortcomings of current legal systems with respect to the alleviation of global sustainability issues like the biodiversity crisis. As a conceptual framework that utilizes the earth system perspective, ESL prescribes ideas for legal reform that equitably consider the well-being of all life on Earth through time while acknowledging their collective participation in an incredibly complex and unpredictable system. A visualization of how ESL is defined by its three foundational elements is provided in Figure 1.

2.2.6 Developmental Gaps

Noticeable gaps in ESL include the incompleteness of its conceptual framework and the need to address the lack of consideration for both ESL and the earth system perspective in the legal field today (in conjunction with the preference for keeping things as they are). Another gap is the need to balance the "zooming in and zooming out" integral to applying a planetary (earth system) perspective towards issues occurring in defined countries or places and between different species (Kotze, 2020; Petersmann, 2021).

2.2.7 Critiques

Critiques of ESG or ESL made by authors outside of its primary conceptual development were reviewed. Albert (2020) used an ecological Marxist approach in a qualitative analysis to point out that proponents of ESG should be careful not to frame the concept in a manner that supports authoritarian regimes (which may be less obvious when the collective objective is to ensure environmental protection and sustainability). Albert (2020) added that planetary-level

governance will resemble authoritarianism so long as ESG ignores the necessary analysis of current power regimes in political and economic spheres (which is problematic since capitalistic pursuits can be argued as at-fault for many of our sustainability problems). In this light, Albert (2020) emphasized democratization in the practice of ESG as well as the harm (or lack of good) that ESG could provoke in its failure to directly address capitalism, arguing that such a system is inherently problematic. Thus, Albert (2020) stated that ESG should utilize views and objectives that coincide with post-capitalism.

Another critique offered by Petersmann (2021) discussed ESL's focus on the cause-effect, self-organizing aspects of Earth and how ESL should adopt a more "sympoietic" view that addresses what is created or influenced by the Earth system's environment (evolving relationships between different living things, for example) rather than just the system itself. Additionally, Petersmann (2021) pointed out the lack of clarity in ESL research surrounding the execution of legally supporting humans and non-human species equally (as ESL promotes). This is important given that 1) the former negatively impacts the latter more than vice versa and 2) there is a belief still being perpetuated by current systems that humans are the most important beings on Earth. Petersmann (2021) suggested that ESL should refrain from promoting a fully collective identity for the planet but instead focus on the dual idea that everything on Earth is united on one planet but differ in their histories, extent of vulnerabilities and subsequent needs. Lastly, Petersmann (2021) pointed out that being overly proactive instead of reactive, as ESL also promotes, can have consequences if context provided by the past is forgotten or ignored.

A final critique of ESL that was acknowledged by its foundational authors is that ESL must ensure in its application that it remains open-minded to how exactly ESG is practiced through legal systems (beyond the principles and ideas associated with planetary boundaries) (Kim et al., 2022).

2.2.8 Critical Analysis of ESL Literature

A critical analysis of this conceptual ESL literature reveals first that greater diversity in terms of authorship as well as the focus of ESL studies is needed. Such an impactful concept should follow its own principles and be further developed by as many unique perspectives as possible. While ESL requires further research on its conceptual parameters to develop the concept fully (as many authors mentioned), it is also apparent that planetary boundaries will continue to be threatened until institutional transformations are implemented. Therefore, ESL proponents should simultaneously direct their immediate work towards its articulation and suggested application for actual policymakers and legal practitioners. No one has published a theoretical description of a real-world legal system transformed by ESL nor the steps to achieve this, and in general, how to apply an ESL perspective in real-world contexts has been given limited attention to date. Also, research is needed to explore in detail ESL's implications on specific global sustainability issues (such as the biodiversity crisis), including the current laws in place for these issues (such as biodiversity protection law). Notably, this study aims to contribute to these research gaps. Lastly, ESL suggests a need for transforming current legal systems but has not mentioned barriers to this endeavor, such as from the embeddedness of law in interconnected institutions needing to undergo similar transformations for legal transformations to be effective.

2.2.9 ESL In Practice

Few published studies have analyzed ESL in practice. To direct its practice, Kotze (2020) stated numerous overarching goals for ESL:

- repair past and present damages to Earth's system while preventing (or in some cases minimizing) further harm,
- extensively resolve injustices done to both humans and ecosystems in the present and future,
- embrace core aspects of the Anthropocene (rather than the Holocene) such as "instability, unpredictability and complexity", and
- sustain (and rehabilitate where required) the integrity of Earth's system including its ability to support life (Kotze, 2020).

These goals provide excellent direction by surpassing the vagueness often associated with the sustainable development objectives put forth by organizations today. However, Kotze's (2020) goals do little to consider, let alone address, the tensions between themselves and current institutions or individuals whose pursuits are generally based on non-earth-system perspectives. Without adjusting everyone else's perspectives to be aligned with ESL, their perceived costs associated with achieving Kotze's (2020) goals will likely outweigh their perceived benefits.

Another article aimed at directing ESL practice is Mai and Boulet's (2021) study that described five challenges associated with practicing ESL and their respective solutions to ultimately design an agenda for ESL implementation going forward. This agenda includes articulating ESL's relevance, promoting constructive and inclusive dialogue, maintaining the

goal of provoking change, developing (mental) flexibility and working with people across numerous disciplines (Mai & Boulet, 2021).

Ahlstrom et al. (2021) utilized ESL to assess current shortfalls and potential improvements for water-related governance as it relates to five prevalent (global) water issues. Ultimately, its authors developed a unique framework where legal principles and their overlapping connections to the outlined water issues were evaluated from an ESL perspective (Ahlstrom et al., 2021). Ahlstrom et al.'s (2021) organizational framework and ways of applying the ESL perspective for their study could be applied at least partially to other studies that use an ESL perspective to examine a different sustainability issue, including the biodiversity crisis. Notably, Ahlstrom et al. (2021) showed the use of adding interdisciplinary and issue-specific details into legal decision-making, although it relied on existing legal principles and thus the assumption that those principles are sufficient without reform under the ESL perspective.

On the topics of biodiversity protection and ESL in practice, ESL researchers must do better to outline how the perspectives and interests of non-human species will be addressed and who will be their collective or individual voice in varying circumstances.

2.2.10 Ecocentric and Biocentric Perspectives

Van Uhm (2018) noted that an ecocentric approach values species as parts of ecosystems, serving a purpose that extends beyond themselves or what they provide for humans, while the biocentric approach values them simply as living beings. The ecocentric approach cares less for individual beings as it focuses on the importance of an entire ecosystem, viewing the living and non-living things that contribute to said ecosystem as equally valuable parts of a whole (Mosquin & Rowe, 2004; Cairoli, 2018). In contrast, the biocentric

approach focuses only on individual beings, attributing their importance to the fact that they are alive while granting no significance to non-living things or the ecosystems that feature both living and non-living things (Mosquin & Rowe, 2004; Cairoli, 2018). Ecocentric and biocentric approaches are similar in that no living species is deemed more important than another, and some even consider them to be interchangeable because of their shared aim to protect nature instead of only focusing on the needs or desires of humans (Rottman, 2014). Together, these approaches represent the non-human-centered views of biodiversity that have become increasingly prominent as some institutions look to enhance biodiversity protection (Van Uhm, 2018). This is most clearly observed through the rights of nature movement whereby non-human species have been granted rights in select circumstances or jurisdictions that are similar to those provided for humans (Gellers, 2021; Van Uhm, 2018). This has only occurred in a small number of jurisdictions, though. Therefore, while these valuation approaches are linked to adopting rights for nature and enhancing biodiversity protection, and in general are considered "more reliably and robustly related to environmentalism" compared to anthropocentric views (Rottman, 2014), their influence has been limited thus far (Gellers, 2021). Arguably, ESL has greater potential to be impactful given its more extensive approach that links these perspectives with broader characteristics of Earth's system, promoting a deeper integration of the ecocentric and biocentric perspectives into legal systems.

The ESL literature connects ESL with these valuation approaches, with Kotze (2020) mentioning that ESL must enhance biodiversity protection for the benefit of the living beings themselves as well as the entire planet (rather than solely for the benefit of humans). Both Kotze (2020) and Gellers (2021) state that the rights of nature movement (linked to ecocentric

and biocentric perspectives) are a clear, albeit incomplete, example of ESL's principles being applied to improve legal systems.

On a deeper level, ESL's strong consideration for inclusivity as well as its utilization of the earth system perspective, which draws attention to all life on Earth as equal contributors to the planet's resilience and functionality, present the logical argument that the ecocentric and biocentric approaches are deeply embedded within ESL. Further, the removal of these approaches would change the concept of ESL altogether. With that said, ESL researchers make it apparent that ESL is not an outright display of the ecocentric (or biocentric) approach as it does not focus solely on ecological rights, but instead maintains its focus on sustainability and justice for Earth and all its inhabitants (Kotze & Kim, 2020; Kim, 2021; Pope et al., 2021). This is reasonable, though one might suggest that ESL should emphasize the ecocentric and biocentric approaches at least in the beginning of its practice to better respond to, as well as undo years of, consequences associated with the deeply-rooted "humans as Earth's masters" rhetoric (Kotze & Kim, 2021). This notion is supported by Kotze (2020), who stated that the principles underlying these approaches would be helpful in dismantling the unequal power dynamics on Earth that hold humans above non-human species.

In writing a justice model for ESL that gives non-human species a major role, Pope et al. (2021) mentioned the "dignity of life" as an attribute that should be provided to both humans and non-human species and ultimately upheld by ESL and legal systems in general. While acknowledging value in the ecocentric approach's ability to transform humans and their systems for the better, Pope et al. (2021) also mentioned that an entirely ecocentric perspective is limited by what humans know and understand about ecosystems, leading to

other potential issues. Thus, Pope et al. (2021) supported a socio-ecological approach for ESL that transcends both the anthropocentric and ecocentric approaches, reflecting a statement made in the previous paragraph about ESL and its focus on a form of planetary justice that extends beyond an outright display of the ecocentric (or biocentric) approach (Kotze & Kim, 2020; Kim, 2021; Pope et al., 2021).

This segment of the literature review affirms that the ecocentric and biocentric approaches to valuing non-human species are an important aspect of ESL, especially in its application towards improving biodiversity protection and resolving injustices imposed by humans against non-human species. However, ESL with its earth system perspective offers more than what either or both of these approaches do on their own.

2.2.11 A Novel Conceptual Framework

The review of ESL literature produced the following key finding: a conceptual framework for ESL, visualized in Figure 1 below, that summarizes its principles, characteristics and critiques in accordance with the literature.

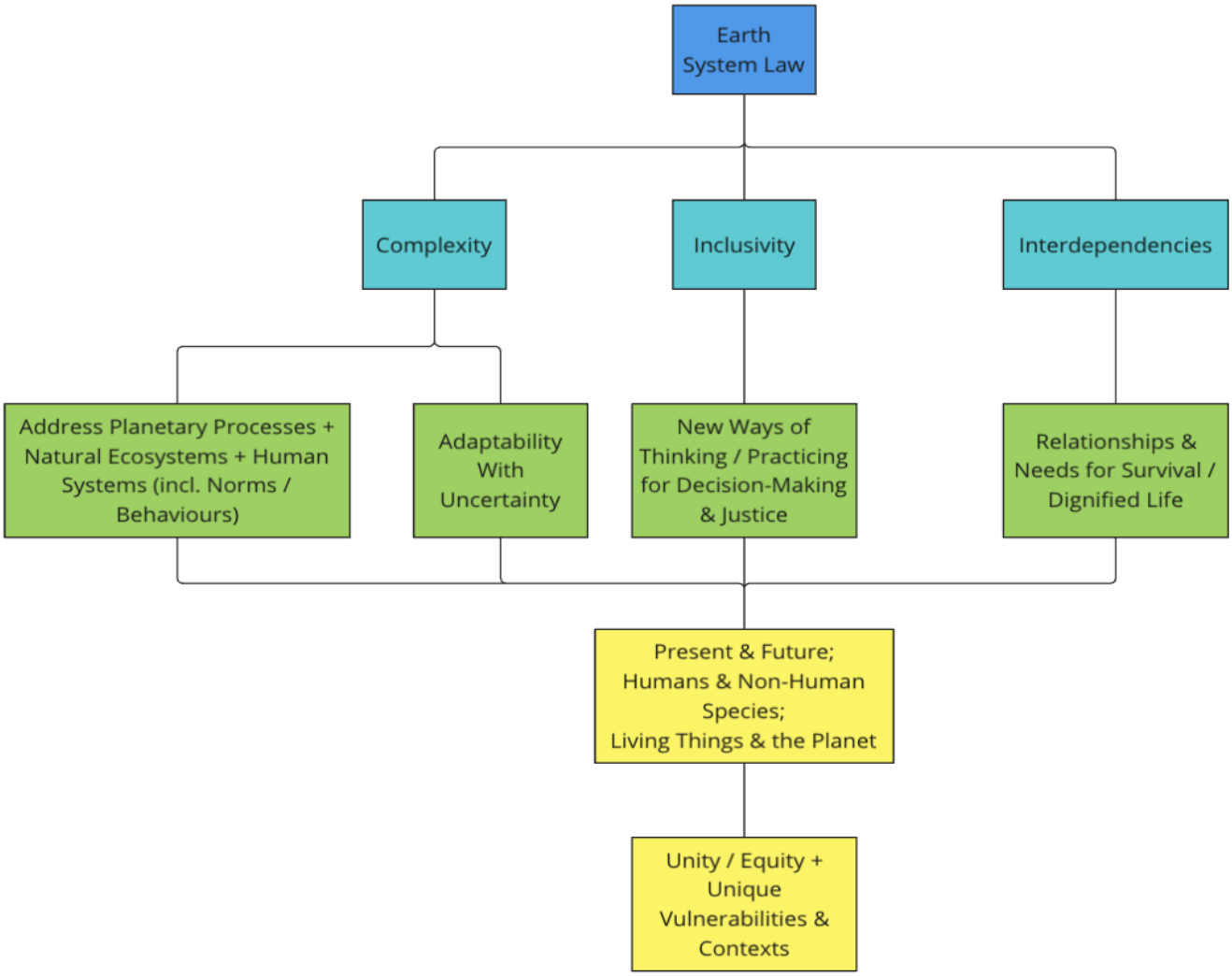


Figure 1. A novel conceptual framework for ESL.

The framework's significance lies in its illustration of the three foundational elements of ESL and their interconnected role in shaping ESL. Specifically, it outlines each element's (and taken together, ESL's) transformative nature that sets ESL apart from today's legal systems, including the aspects that render ESL capable of effectively addressing the biodiversity crisis and other global sustainability issues in the Anthropocene. The framework also ties the foundational elements to collective goals of unity, equity and the acknowledgement of unique vulnerabilities and contexts to emphasize ESL's broader vision of justice and sustainability for all beings on

Earth through time. Overall, this framework seeks to encapsulate ESL and acts as a starting point for the development of an ESL-based legal assessment tool to conduct this study's directed content analysis.

2.3 Canadian Biodiversity Protection Law

2.3.1 Historical Context

Canada is a signatory on numerous legally-binding international treaties related to biodiversity protection, most notably the Convention on Biological Diversity or CBD (signed by Canada in 1992) (Government of Canada, 2020). As required by Article 6 of this convention, Canada developed the Canadian Biodiversity Strategy in 1995 to direct national endeavors for protecting biodiversity (through numerous government departments led by Environment and Climate Change Canada) in a manner that fulfills its commitments under the CBD (Government of Canada, 2020). This strategy supported numerous pieces of Canadian legislation relevant to biodiversity and led to the development of the Species at Risk Act or SARA in 2002 (Government of Canada, 2016). Canada's biodiversity strategy along with the CBD's Aichi Targets (2011-2020 targets for biodiversity protection according to CBD's 2011-2020 Strategic Plan for Biodiversity) inspired Canada to develop its own biodiversity targets in 2015 to be achieved by 2020 (Biodivcanada, n.d.).

Regarding Canada's legal framework for protecting biodiversity, Canada's constitution (1867) assigned its provinces and territories legal power over the lands and natural resources residing in their respective jurisdictions and, generally speaking, over wildlife (considered a matter "of a private or local nature") that are not on federal lands other than birds and fish (Ray et al., 2021; Swerdfager & VanNijnatten, 2024). The federal government's scope of legal

power focuses on well-defined areas of land designated as federally owned (such as national parks, marine areas and airports), which amounts to just a minority of the nation's total natural territory (with the majority in the jurisdiction of provinces and territories). The federal government also holds power over specific areas of concern regardless of location or jurisdiction such as migratory birds, aquatic species, inter-provincial trade and items considered relevant to the "peace, order and government of Canada" (Ray et al., 2021; Swerdfager & VanNijnatten, 2024). With this, there is overlap between the federal government's and the provincial and territorial governments' ability to address biodiversity from a legal standpoint. However, a significant portion of biodiversity protection pertains to land management and provinces and territories ultimately have greater jurisdictional control and therefore greater influence over biodiversity protection in this context (especially for terrestrial biodiversity) (Ray et al., 2021). This, combined with the continuous need for federal, provincial and territorial governments to align their legal efforts for biodiversity protection to ensure equally effective protection across the country, makes it difficult for the federal government to act on its own to meet Canada's national biodiversity targets or its international obligations for biodiversity protection. This sharing of responsibility is also problematic given that the provinces and territories often prioritize their most profitable industries over protecting biodiversity (Ray et al., 2021). With that said, Canada's biodiversity strategy designates the protection of biodiversity to federal, provincial and territorial governments as an exercise of cooperative federalism, intending for these governments to collaborate and ensure consistency in their approach to biodiversity protection throughout the country (Government of Canada, 2020). Further, select circumstances allow the federal government to intervene and improve

biodiversity protection on non-federal lands (under SARA amongst other pieces of legislation) (Favaro et al., 2014; Turcotte et al., 2021). However, analyses suggest that the federal government generally avoids such interventions (Bolliger et al., 2020; Favaro et al., 2014; Turcotte et al., 2021) and allows the practice of cooperative federalism to result in "lowest-common denominator" outcomes. This maintains the somewhat dominant role of provinces and territories and ultimately sustains poor legal biodiversity protection across Canada (Ray et al., 2021).

While the previous paragraph outlines limitations regarding the impact of federal biodiversity protection laws in Canada, such federal laws remain relevant to biodiversity protection in Canada. In particular, they stand to be more impactful if the federal government were to exercise more spirited leadership and utilize the full extent of their powers to protect biodiversity on non-federal lands (Bolliger et al., 2020; Ray et al., 2021; Turcotte et al., 2021). Also, from an ESL standpoint, Canada's federal laws share closer ties with international laws and are arguably more equipped to adopt ESL's earth system perspective, making them a valuable subject in the exploration of ESL's real-world application as this study contributes to.

2.3.2 Current Implementation

Canada continues to implement SARA as a key legislative tool for protecting biodiversity across the country. SARA itself focuses on endangered species facing the greatest risks of extinction or extirpation and thus acts as one of Canada's most relevant legislations to the alleviation of the biodiversity crisis (Government of Canada, 2016). Provinces and territories in Canada have their own jurisdictional laws to protect endangered species, though these laws are often considered to be inadequate in fulfilling their purpose (Ecojustice, 2012; Turcotte et al.,

2021; Ray et al., 2021). Canada implements other federal legislation relevant to biodiversity protection as well, such as the Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (WAPPRIITA) and Migratory Birds Convention Act (MBCA) (Government of Canada, 2017). Despite all of its legal efforts to protect biodiversity in Canada, the country's progress in meeting its own national targets for biodiversity protection was deemed slow and insufficient (CHM of the CBD, 2018).

2.3.3 SARA

Favaro et al. (2014) summarize SARA's process as well as its outcomes for biodiversity to-date (from SARA's establishment to their time of research), and so their work along with the Act itself will be referenced throughout this subsection of the literature review, with just one citation provided for each reference at the end of the paragraph.

SARA serves as one of Canada's key federal laws for protecting biodiversity. Central to SARA is the listing of species that are assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), which evaluates species' risks based on scientific and Indigenous knowledge. COSEWIC categorizes species as extinct, extirpated, endangered, threatened, of special concern, not currently at risk or none of the above due to insufficient information. The federal government, Canada's Minister of the Environment and Minister of Fisheries and Oceans in particular, combine COSEWIC's scientific recommendations with socio-economic considerations (within 90 days of receiving COSEWIC's counsel) to make final decisions on species listings. Listed species are afforded protections under SARA, which include prohibiting harm, killing or trade of individuals, as well as mandating the protection of critical habitats. SARA requires the development of recovery strategies (within one to two years of species

listing) and action plans (some time following the recovery strategy's publishing) for endangered and threatened species. Recovery strategies outline species-specific threats, objectives and approaches for recovery, while action plans provide detailed implementation measures, timelines and socio-economic considerations. Both documents emphasize protecting critical habitats, which are federally safeguarded where possible (namely on federal lands), with collaborative agreements encouraged for non-federal lands. Additionally, management plans are required (within three years of species listing) for species of special concern to prevent their decline into higher-risk categories, though the full range of protections are not granted to these species. Management plans focus on addressing risks through voluntary and cooperative conservation measures. In emergencies, SARA allows the issuance of orders to provide immediate protection to species facing imminent threats. While this powerful tool can override jurisdictional boundaries, its use has been rare, reflecting the federal government's cautious approach. Overall, SARA reflects an effort to balance ecological, legal and socio-economic priorities in addressing Canada's biodiversity crisis (Favaro et al., 2014; Government of Canada, 2002).

Turcotte et al. (2021) emphasize the fact that decisions within SARA's framework (i.e. the listing of species and thus which species are granted legal protections) are ultimately made by members of government rather than experts in the form of COSEWIC. With this, SARA's impact hinges on the discretion of government actors.

Favaro et al. (2014) performed a quantitative study that evaluated species in Canada that were assessed more than once by COSEWIC, revealing that 115 of 369 species saw worse risks of extinction or extirpation through time while 202 maintained their previously-assessed

risk levels. Further, 305 of 369 species were not only assessed but also officially listed under SARA, but just 56 saw their critical habitat identified for protection as required under SARA, for no reason other than the government failed to fulfill its duties as directed (Favaro et al., 2014). While the maintaining or enhancing of risk to the majority of these species may not be attributed entirely to inadequate legal efforts, it is suggested that SARA itself and its poor implementation have a meaningful role in these outcomes for species and upgrading SARA and its implementation can improve such outcomes (Favaro et al., 2014). These findings, combined with other literature referring to Canada's legal shortfalls to do with biodiversity protection (such as Bolliger et al., 2020; Creighton & Bennett, 2019; Lemkow & VanderZwaag, 2014; Olive, 2012; Olive, 2014; Ray et al., 2021; Turcotte et al., 2021; Waples et al., 2013; and Wyatt, 2021) as well as Canada's aforementioned failure to meet national and international biodiversity protection targets, outline a clear need for Canada to make changes to its legal system to better alleviate the biodiversity crisis.

SARA was designed with good intentions from an ESL perspective. In the legislation itself and across its tools for implementation (such as species-specific recovery strategies), there are declarations stating wildlife has intrinsic and ecological value beyond that which is relevant to humans and that this drives SARA's conservation goals. Both biocentric and ecocentric perspectives are already present in SARA, revealing how its development drew from Canada's CBD commitments and intentions to move beyond anthropocentricism. However, the literature points to SARA having shortfalls in this regard and that better outcomes for wildlife have yet to be realized due in part to these shortfalls, suggesting that SARA is actively undermining its own

foundational intention. The extent to which this undermining is being presented through SARA's own legal text will ultimately be examined through this study.

2.4 Conclusion

This literature review provided background knowledge on ESL (outlining its three foundational elements that were inclusivity, interdependencies and complexity), recognized the deeply-embedded presence of ecocentric and biocentric perspectives within ESL as well as their current application as part of the rights of nature movement, and described both the historical context and present-day outcomes associated with SARA. Overall, the literature review outlines an insufficiency in legal protection for biodiversity in Canada, in contrast with intentions laid for SARA including the inherent valuation of wildlife, and how ESL offers promise by fundamentally incorporating this inherent valuation among other principles to properly integrate and thus achieve sustainability goals across legal systems. The legal deficiencies that limit protection for biodiversity can often be linked to the prioritization of human interests above all else, from not listing certain species under SARA because protections would conflict with industrial activities to limiting the use of federal powers (e.g. emergency orders under SARA) on non-federal lands in favor of provincial approaches to economic development (Creighton & Bennett, 2019; Ray et al., 2021). ESL employs its three foundational elements to value humans and non-human species equally from a legal standpoint and genuinely pursue sustainable outcomes for all participants in the Earth system, thus appearing capable of correcting these legal deficiencies to make a positive difference for biodiversity.

3 Methods

3.1 Overview

This study aims to evaluate SARA, a key element of Canada's legal wildlife conservation efforts, from an ESL perspective to explore the practical application of ESL and outline potential pathways to improve biodiversity protection law (in Canada) to better address the biodiversity crisis. Its specific objectives are to develop an assessment tool from ESL's principles, apply it to SARA (including the legislation itself as well as fifteen of its instruments) and assess the ways and extents to which SARA supports or contradicts ESL. Achieving these objectives required several steps: a review of ESL's literature to confirm its principles, developing, trialing and revising qualitative analysis codes from ESL's principles, systematically selecting the SARA documents to analyze, using the developed codes to conduct a directed qualitative content analysis on all selected documents and organizing and interpreting the coded data to gather relevant insights.

In leading the design and execution of this study's methodology, I drew on the published literature addressing qualitative content analysis, including those authored by Bengtsson (2016), Hsieh and Shannon (2005) and Assarroudi et al. (2018). Further, a thoughtful consideration of both my internal resources (including expertise and preparedness) and external resources (including time and capital) was conducted prior to and during the methodology's development. This ensured that the chosen research methods reflected the type and amount of resources available to me as a researcher and subsequently maximized the study's quality based on current circumstances (Bengtsson, 2016).

3.2 Chosen Research Methods

3.2.1 Qualitative Approach

As mentioned, the study utilized a qualitative research approach. A qualitative design was selected because the aim of the study was to evaluate the meanings (a crucial aspect of qualitative research) derived from SARA-related text and themes according to an ESL perspective, with the purpose of outlining gaps as well as pathways for improvement (Creswell & Creswell, 2018). Further, the study has numerous interpretative goals including interpreting ESL literature to build an appropriate and effective method to apply the concept, interpreting text from SARA and fifteen of its instruments to apply certain qualitative codes and interpreting the application of codes to discern SARA's support or contradictions regarding ESL. This aligns with qualitative research, since "all qualitative research deals with some interpretation", opting to assign meaning to data through this approach as opposed to statistical analysis (Bengtsson, 2016).

Content analysis was determined as the most appropriate form of qualitative research for this study, given its fit with the study's characteristics relative to other qualitative approaches such as an ethnography or grounded theory (Creswell & Creswell, 2018; Hsieh & Shannon, 2005). Content analysis has been defined as a research approach that gathers sound conclusions from text or written data in a manner that is systematic and reproducible to describe certain topics or circumstances (Bengtsson, 2016). This definition further clarifies the alignment between content analysis and this study, as the latter seeks to collect credible conclusions from published legal documents to describe their alignment with ESL's principles. Lending itself further to this study, content analysis can apply to any form of text as well as any

topics or contexts and does not involve following any specific set of rules (Bengtsson, 2016). Although, there are ways to conduct content analysis to ensure enough rigor and credibility to produce reliable results, which were considered for this study (Bengtsson, 2016). For instance, ample planning was performed prior to collecting any data, including confirmation of the study's aim, its sample and units of analysis and its preference for using deductive reasoning (by testing ESL principles) (Bengtsson, 2016). Also, the analysis method was planned out so that it combines a manifest (concerning the obvious or apparent) with a latent (concerning the hidden or implied) analysis to produce various meanings from the chosen texts capable of achieving the research objectives (Bengtsson, 2016).

Hseih and Shannon (2005) outlined three different types of content analysis: conventional, directed and summative. A directed form of content analysis was selected for this study because the way in which the content analysis and coding were conducted was structured according to a particular concept (ESL and its principles and characteristics) (Hsieh & Shannon, 2005). Also, the findings from the content analysis provide supporting or non-supporting evidence for a particular theory, in this case the theory reinforced by ESL researchers that current legal systems have not yet adopted principles and characteristics of ESL (Hsieh & Shannon, 2005). Directed content analysis is often utilized by the healthcare sector, and little has been published about its application as a research method compared to the more commonly used conventional content analysis (Assarroudi et al., 2018). Assarroudi et al. (2018) examined and combined multiple published descriptions of how to conduct directed content analysis to establish sixteen steps, divided into the preparation, organization and reporting phases, that were treated as a guideline for this study. For the preparation phase, I

confirmed my own acquisition of general skills deemed relevant to conducting directed content analysis (such as "analytical abilities, continuous self-reflection…creative thinking, scientific writing, data gathering and self-scrutiny" (Assarroudi et al., 2018)). I also chose a suitable sampling strategy described later in this section, decided on analyzing both manifest and latent content, clarified the unit of analysis and thoroughly engaged with the data to be analyzed (Assarroudi et al., 2018).

3.2.2 ESL-Based Assessment Tool

Performing the directed content analysis for this study required a systematic approach that could extract qualitative data from legal documents using an ESL perspective and produce credible results. This required the development and application of a unique assessment tool, otherwise known as a categorization matrix with clear definitions for all categories and subcategories, acting as the first and second steps of the organization phase (Assarroudi et al., 2018). Building such a tool required a critical analysis of ESL's principles, characteristics and critiques, which was performed as part of the literature review and summarized by the framework shown in Figure 1. This framework ultimately serves as the tool's foundation. Notably, it reflects ESL's non-human-centered perspective, which enhances the ability of the content analysis and its findings to be attentive to human biases that provoke injustices against non-human species (an important factor when evaluating biodiversity protection law). Next, the framework was converted to a list of qualitative codes so it could take on the full form of an assessment tool. This involved using the framework's second row (ESL's three foundational elements) as distinct categories for the codes (so one can assess the content's alignment with ESL according to the alignment with each of ESL's primary elements), and using the third and

fourth rows to produce multiple codes for each category that collectively summarize each element's intention (so that one can assess the content's alignment with each ESL element according to a variety of factors). Also, codes that describe the absence of an ESL element (e.g. No Inclusivity) were established for each category to outline any text that completely misaligns with that ESL element. These codes were each assigned "coding rules" to thoroughly describe their unique properties that were previously defined or outlined by the ESL literature, completing the next step in the organization phase (Assarroudi et al., 2018).

Next in the organization phase, the initial codes were tested on a small segment of SARA's legislative text to ensure their usability for the purpose of this study (Assarroudi et al., 2018). Upon testing the codes, an adjusted list of codes was produced to more effectively carry out the content analysis, as shown in Table 1. A more detailed codebook including definitions and descriptions can be found in the Appendix.

Table 1. Adjusted qualitative codes designed to apply ESL.

Inclusivity	Inclusion of Present-Day Humans
	Inclusion of Future Humans
	Inclusion of Present-Day Non-Human Species
	Inclusion of Future Non-Human Species
	Inclusion of Greater Timescales
	Inclusion of Geographic Areas (Outside of Canada)

	Normative Inclusivity
	Potential Inclusivity
	Missed Opportunity
Interdependencies	Interdependencies Between Humans & Non-Human Species
	Interdependencies Between Humans & Planet Earth
	Interdependencies Between the Present & Future
	Interdependencies Between Geographic Areas
	No Interdependencies
Complexity	Complexity in Human Systems
	Complexity in Natural Systems
	Adapting to Uncertainty or Unpredictability
	Complexity Regarding Information (Info. Gaps)
	Complexity Regarding Information (Info. Reliability)
	Nonlinearity
	Tipping Points
	Precautionary
	No Adapting (Typical or Predictable)

	No Complexity

Giving special attention to biocentric and ecocentric perspectives, the codes deemed most relevant include Natural Systems, Precautionary, Tipping Points, Present-Day Non-Humans, Future Non-Humans, Humans vs. Earth and Humans vs. Non-Humans (because there is a strongly apparent logical connection between the two perspectives and each of these codes). Results for these particular codes were used to address the fourth research question and describe SARA's approach to these perspectives according to its legal text.

3.2.3 Subjects of Analysis

With the assessment tool built and tested as qualitative codes, it was used to perform a directed content analysis on SARA's primary legislative document as well as fifteen species-specific documents serving as instruments for SARA's implementation. These fifteen instruments of SARA included five recovery strategies and their associated action plans (RS+APs) for select at-risk species, five multi-species action plans (MSAPs) for at-risk species in specific geographic areas in Canada and five management plans (Mgmt. Plans) for certain species of special concern. SARA was selected as the primary subject of analysis because it is a prominent legislation for federal wildlife protection in Canada that represents a significant portion of Canada's legal efforts to combat the biodiversity crisis. The fifteen instruments of SARA outlined above were selected as subjects of analysis because they provide a sufficient representation of SARA's elements that ultimately determine its value as a legal tool for biodiversity protection. Notably, the fifteen instruments that were analyzed speak to species that are not considered as migratory birds (to avoid having to include Canada's Migratory Birds

Convention Act in the study) but may be granted additional protection by other wildlife conservation legislation such as Canada's Fisheries Act. These instruments of SARA were chosen through a systematic process, producing the list of documents described in Table 2.

Table 2. SARA documents selected for analysis and their unique characteristics.

SARA Document	Geographic Range in Canada	Species Type	Ecosystem Type	Additional Unique Factors or Comments
SARA Legislative Document (2002)	All of Canada	All	All	SARA's foundational document
RS+AP for Woodland Caribou (Boreal Population) (2020)	B.C., Alberta, Saskatchewan, Manitoba, Ontario, Quebec, Newfoundland & Labrador, Northwest Territories, Yukon	Terrestrial Mammal	Boreal	Ungulate; Extensive Canadian Range; High Stakeholder Interest
RS+AP for Blanding's Turtles (Nova Scotia Population) (2020)	Nova Scotia, Atlantic Ocean	Reptile	Ocean	Crosses International Boundaries
RS+AP for Black-Tailed Prairie Dogs (Canadian Population) (2021)	Saskatchewan	Terrestrial Mammal	Grassland	Rodent
RS+AP for Sable Island Sweat Bees (2020)	Nova Scotia	Arthropod	Island	N/A

RS+AP for Leatherback Sea Turtles (Pacific Population) (2019)	Pacific Ocean	Reptile	Ocean	Crosses International Boundaries
Mgmt. Plan for Eastern Wolves (2021)	Ontario, Quebec	Terrestrial Mammal	Various	Carnivorous Predator; Crosses International Boundaries
Mgmt. Plan for Monarch Butterflies (2016)	B.C., Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia, P.E.I.	Arthropod	Various	Well-known; Extensive Canadian Range; Crosses International Boundaries
Mgmt. Plan for Western Toads (Calling & Non-calling Populations) (2020)	B.C., Alberta, Northwest Territories, Yukon	Amphibian	Various: Aquatic & Terrestrial	N/A
Mgmt. Plan for Pygmy Snaketails (2013)	Quebec, New Brunswick	Arthropod	Various: Rivers & Forests	Lesser-known Arthropod; Crosses International Borders
Mgmt. Plan for Five-lined Skinks (Great Lakes/St.Lawrence Population) (2013)	Ontario	Reptile	Various	Lesser-known Reptile; Only Mgmt. Plan for a Non-Snake Reptile in Eastern Canada
MSAP for Rouge National Urban Park (2021)	Ontario	Multiple	Urban	Only Urban Park With an Action Plan

MSAP for Banff National Park (2017)	Alberta	Multiple	Multiple Including Boreal Forest	Canada's Oldest National Park; Major Global Tourist Attraction; Includes the Canadian Rocky Mountains; In a Province With Significant Energy Development
MSAP for La Mauricie National Park & National Historic Sites of the Mauricie and Western Quebec Regions (2022)	Quebec	Multiple	Multiple Including Boreal Forest	Only Document That Represents Just Quebec; Includes Historic Sites
MSAP for Grasslands National Park (2016)	Saskatchewan	Multiple	Grassland	Represents a Singular Unique & Crucial Ecosystem
MSAP for Georgian Bay Islands National Park (2016)	Ontario	Multiple	Islands with Various Ecosystems	Represents the Unique Qualities of Islands; World's Largest Freshwater Archipelago

To summarize the document selection process, the aim was to select documents that are representative of different geographic areas or jurisdictions in Canada, have a published corresponding action plan if it is a species-specific recovery strategy (to evaluate the literal actions currently or expected to be taken to protect species) and representative of different types of species. Canada's "Species at risk public registry", a website hosted by the federal

government, was visited on November 7, 2022. In particular, the "Document search" page that can be accessed here: https://species-registry.canada.ca/index-en.html#/documents?sortBy=documentTypeSort&sortDirection=asc&pageSize=10. 3462 documents were filtered down to 610 documents by including only action plans, management plans and recovery strategies. This list needed to be narrowed down further to make the selection process easier. First, exclusions were made based on taxonomic groups: no marine mammals, birds, fish (freshwater or marine) or molluscs, to avoid any necessary involvement of the Migratory Birds Convention Act or the Fisheries Act (the primary legislative protectors for the above taxonomic groups), and no vascular plants, lichens or mosses, leaving only terrestrial mammals, reptiles, amphibians and arthropods. Next, documents that were currently delayed, had their finalization delayed or were currently under a 30 or 60-day comment period as of November 7, 2022, were excluded so any analyzed documents would not be updated (and potentially altered to an extent that would impact its evaluation for this study) during or soon after the study's completion. 167 documents remained. Of these documents, just six species-specific recovery strategies with their corresponding action plans existed, including those for the: Woodland Caribou (Boreal Population), Blanding's Turtle (Nova Scotia Population), Black-Tailed Prairie Dog, Sable Island Sweat Bee and Leatherback Sea Turtle (Pacific & Atlantic Populations, respectively). Only the Pacific population of the Leatherback Sea Turtle was selected so no single species would be analyzed twice and to account for the fact that the Blanding's Turtle already represents the Atlantic Ocean area. With this, the five remaining pairs of documents (RS+APs) were selected for the study. Upon scanning the 167 documents for management plans, five of the 37 available plans were selected as they each offered unique

attributes regarding their geographic area and species type, ensuring not to include any more turtles, bees, caribou or prairie dogs while including at least one amphibian (the only taxonomic group that wasn't already selected for analysis). With this, the five selected Mgmt. Plans were assigned to the following species: Eastern Wolf, Monarch, Western Toad (Calling & Non-calling Populations), Pygmy Snaketail and Five-lined Skink (Great Lakes/St. Lawrence Population). Upon scanning the 167 documents for multi-species action plans, five of the 24 available plans were selected, primarily based on their representations of different types of ecosystems because it was deemed the most interesting and differentiating factor between documents and for multi-species protection in general. With this, the selected MSAPs speak to the following areas in Canada: Rouge National Urban Park, Banff National Park, La Mauricie National Park & National Historic Sites of the Mauricie & Western Quebec Regions, Grasslands National Park and Georgian Bay Islands National Park. Together, the selected documents represent different geographic areas of Canada, different taxonomic groups or types of species and different ecosystems.

3.2.4 Process for Analysis

Each selected document was analyzed and coded using NVivo 12. Documents were analyzed front to back, including all introductory pages and appendices. In many instances, segments of text within a document had more than one code applied to them at once. Also, numerous documents had similar or even the same paragraphs to introduce, conclude or act as an appendix for the document, and these paragraphs were still coded (using similar codes) in every instance. Table 3 below includes examples of how text from SARA and selected

instruments of SARA was coded including descriptions for why select codes were applied in a given instance.

Table 3. Three examples of how the study's qualitative coding was executed.

Segment of SARA-Related Text	Codes Applied and Their Reasoning
Example 1. "Due to the specific life history characteristics they possess, boreal caribou are limited in their potential to recover from rapid, severe population declines. Habitat alteration (i.e. habitat loss, degradation, and fragmentation) from both anthropogenic and natural sources, and increased predation as a result of habitat alteration have led to local population declines throughout their distribution. Some local populations of boreal caribou are at risk because of other factors, mainly over-harvest. Threats are closely interrelated and act cumulatively to have direct or indirect impacts on boreal caribou and their habitat. Recovery of all boreal caribou local populations across Canada is technically and biologically feasible."	Adapting: The limited ability of the species to adapt to certain difficult circumstances was mentioned. Human Systems: The harvesting of animals by humans, a major aspect of human systems, was mentioned, as was humans' perceived ability to technically and biologically recover populations of a species, speaking to aspects of governance and psychology within human systems. Natural Systems: The harvesting of animals by humans can also speak to natural systems. Also, habitat and population dynamics were mentioned as well as the species' life history characteristics (brought about via evolution). Info Reliability: Statements made here are supported by information regarding a

-Woodland Caribou, Page vii of the Executive Summary	species' status, needs and threats that is treated as reliable. The information used to inform the feasibility of species recovery is also assumed to be reliable through time, though this may not be the case. Precautionary: Precaution is being exercised by considering cumulative impacts from both natural and anthropogenic sources and considering the species' sensitivity to experienced declines. Greater Timescales: The species' life history characteristics were mentioned, speaking to centuries of evolution. Present-Day Humans: Using the species to benefit present-day humans via harvesting was mentioned, as was the need to limit this harvesting which impacts said humans. Present-Day Non-Humans: The species' human-specific value, their well-being and their unique traits, needs and threats were all mentioned.

	Humans vs. Non-Humans: Humans depending on non-humans for biological resources and non-humans' well-being depending on our actions were both mentioned.
Example 2. "The following targets will be used to gauge progress until there is sufficient baseline information to ensure the management objective is reached: 1. The highest priority breeding sites have been secured. 2. Best Management Practices have been developed and are actively used (e.g., appropriate hygiene measures as described in British Columbia Ministry of Environment 2008). 3. Research has been undertaken on factors that trigger epidemics of chytrid fungus (and other important amphibian pathogens) and their mechanisms of spread, and has been initiated on other threats, metapopulation dynamics, and habitat use.	Human Systems: The control of land by particular humans in a select location as well as stakeholders deemed relevant to a species' recovery were mentioned. Natural Systems: Disease, population dynamics, life stages and specific habitat requirements were all mentioned. Info Gaps: Tackling others' lack of knowledge through outreach was mentioned, as were efforts to fill species-specific knowledge gaps. Precautionary: Precaution is exercised by pursuing recovery efforts like population monitoring and outreach while still researching the species to learn more about its circumstances and how to best help it. Present-Day Humans: Landowners and managers are included.

4. Population monitoring programs have been initiated in strategic locations across the species' range. 5. Outreach has been implemented to target owners/managers of important habitats on private and leased lands." -Western Toad, Page 27	Present-Day Non-Humans: The species' unique needs, threats and well-being is mentioned. Humans vs. Non-Humans: Non-humans' well-being depending on our actions (hygiene measures) was mentioned.
Example 3. "Establish a wild population of Black-footed Ferrets in Canada that has at least an 80% probability of persisting for 20 years (i.e. less than 20 % probability of extinction in 20 years) 1) Increase the amount of ferret/prairie dog habitat to 900 ha by 2019 and 1200 ha by 2025 2) Reintroduce ferrets when there are a minimum of 10 prairie dogs per hectare of colony (in addition to meeting objective 1 above) to meet the breeding requirements of ferrets. Prevent the Canadian population from becoming threatened or endangered by	Adapting: The ability of a species to persist and thus adapt to encountered circumstances was mentioned. Natural Systems: Optimal scenarios regarding a species' population and distribution were mentioned, as were crucial interactions or relationships with other species in the same ecosystem and population dynamics. Info Reliability: Probabilities of persistence across decades and the circumstances associated with said probabilities were mentioned as though all information was reliable, though it may not be.

ensuring the population maintains at least 90% probability of persistence in 100 years." -Grasslands National Park, Page 42	Future Non-Humans: The well-being of non-human individuals decades from now was mentioned. Greater Timescales: A timescale up to 100 years in the future was mentioned. Present-Day Non-Humans: The unique needs, threats and the well-being of a species was mentioned. Humans vs. Non-Humans: Non-humans' well-being depending on our actions (increasing habitat size; reintroducing individuals) was mentioned.

After performing the main content analysis, the organization phase was completed in three steps (Assarroudi et al., 2018). First, the coded data was reviewed in its entirety (every segment of text that was assigned one or more codes). Second, inductive reasoning was used to arrange the data for a given code into distinct groups based on similarities in meanings or themes (e.g. for Natural Systems, the theme Migratory Species represents all segments of text assigned the Natural Systems code that directly or indirectly mention species migration) to produce "generic categories" (Assarroudi et al., 2018). Once this was done for every code, the final step involved evaluating each category or theme across all codes to produce conclusions for the study's research questions.

Some themes outline clear support for ESL (e.g. Present-Day Non-Humans: Considering Their Intrinsic Value) or a clear misalignment with ESL (e.g., Present vs. Future: Reliant on Future Threats Not Being Bad), though many themes required further analysis to determine if their expression by SARA aligned or misaligned with ESL. Also, themes that immediately outline a clear alignment or misalignment with ESL needed their degree of expression evaluated (relative to other themes and in general) to determine the true extent of said alignment or misalignment. Thus, all themes for each code were critically analyzed (on their own and relative to one another) to extract patterns and meanings regarding the ways and extents that ESL is being supported or contradicted, producing distinct findings for each code that reflect all analyzed documents and effectively address the research questions. The conducting of this critical analysis of themes is described at length in the Appendix. To summarize the process for this particular analysis, each theme had a large portion of its text segments (selected from a range of different documents) critically examined such that the manifest and latent meanings from each segment were extracted to outline how SARA generally or most commonly illustrates a given theme. As an example, for Natural Systems: Population Dynamics & Extents, SARA commonly portrays population dynamics and location ranges as something that can be understood and maintained with minimal disruption to humans as if it were a standalone item separate from a complex system with other variables. SARA's general illustrations for each theme were then evaluated against ESL's own illustrations for the same theme (known or presumed according to interpretations of the literature) to determine degrees of alignment between SARA and ESL for each theme. Findings per theme were then evaluated at the code level followed by the ESL category level to determine SARA's overall alignment with particular

aspects of ESL and ESL as a whole. Altogether, this process allowed for the coded data to be inspected for both quality control (assessing if data was coded properly or needed to be reassigned to different or additional codes) and thematic analysis (clarifying overlapping versus distinguishable themes for the data) purposes. It also established a clear pathway to extract logical and defendable conclusions from the data capable of addressing the study's questions and objectives.

3.2.5 Interpreting and Sharing Results

This study's results can be grouped into two distinct categories. First is the quantitative coding data produced directly by the coding process that describes the number of times groups of codes and individual codes were applied (in general and for each document and document type). Second is the qualitative data, produced by interpreting meanings from the coded text, that describes both the different themes from each code's array of applications and (upon analyzing the themes themselves) the different ways and extents to which SARA aligns or misaligns with ESL. When applied, the codes listed in Table 1 indicate the presence or absence of topics or ideas linked to an ESL perspective (see the Appendix for clarification on each code's indication in this regard). Thus, to an extent, a code being applied can imply support for or misalignment with ESL, depending on whether the code speaks to the presence or absence of an ESL-supportive idea, respectively. However, one must assess how the code was applied (how the ESL-supportive idea is portrayed or discussed in a particular instance) to clarify whether any support or misalignment is genuinely being offered and to discern the extent of the support or misalignment. Therefore, the quantitative coding data may offer limited insights into the content's alignment with ESL but is not considered as primary data to address the study's

research questions. Rather, only the qualitative data acts as primary data as it alone is capable of reflecting SARA's alignment with ESL, though the quantitative coding data offered limited support in select instances.

To conclude the research, the steps taken to conduct the directed content analysis as well as all results were recorded, completing the single step in the reporting phase and the final step in Assarroudi et al.'s (2018) guide to content analysis.

3.3 Reflexivity

Reflexivity, or the acknowledgment of how one's personal attributes and experiences may shape their research, is a crucial aspect of good-quality qualitative research (Creswell & Creswell, 2018).

My role in this study involved interpreting ESL literature to design codes meant for gathering data, using my interpretation of an ESL perspective to code sixteen documents that adequately represent SARA, and extracting themes from coded data that describe Canada's support or contradiction of ESL in the context of its federal legal efforts to protect wildlife. These elements of my involvement outline how central my own interpretations were to this study, which enables possibilities for the study as a whole and its results in particular to be influenced by my personal beliefs and experiences.

My past experiences that are capable of influencing this study include those to do with my deep adoration for wildlife, my frustration with the way humans are currently managing sustainability issues including the biodiversity crisis, my desired outcomes brought about by successfully managing sustainability issues and my core characteristics that center around empathy and the wellbeing of the collective. To address any potential impacts on the study

from these experiences, I made intentional efforts to interpret ESL, conduct the content analysis and extract themes and conclusions with an objective perspective guided by a logical evaluation and application of words and ideas presented in ESL literature. Further, any instances where my adoration for wildlife or other past experiences consciously or subconsciously infiltrated my interpretations could be argued as strengths or advantages for conducting this particular research. This is because ESL involves acknowledging how ineffective current efforts are at addressing sustainability issues, creating space for transformative ways of addressing sustainability issues, prioritizing the enhancement of inclusivity, interdependencies and complexity in the context of the Anthropocene, and adjusting our perspectives to put the needs of non-human species at the frontline of considerations for decision-making (alongside humans rather than behind or below them). With this, my past experiences align well with ESL, the study's research problem and the study's intention.

3.4 Limitations

Two potential limitations associated with this study pertain to ESL and its young body of research. First, it presents the possibility that ESL requires further conceptual development before being used to effectively assess biodiversity protection law (in Canada or elsewhere). Also, ESL's current parameters (as outlined by literature to date) may limit the meanings and interpretations that could be derived from a content analysis (that relies heavily on an ESL perspective), which may suggest that the study's conclusions were limited. I would argue that these limitations did not present themselves in this study to a meaningful degree, as the literature surrounding ESL provided enough conceptual depth to allow the study to produce legitimate findings according to its research objectives. It is possible that more time devoted to

the development of ESL would lead to an enhanced ability for ESL to be applied (to biodiversity protection law or other subjects of law) and perhaps a more comprehensive content analysis that produces more or different meanings and interpretations from the same texts analyzed in this study. However, for the purposes of a master's thesis and given that ESL has yet to be used as a legal assessment tool outside of this study (to the best of my knowledge), ESL's current status is not deemed a problem for the research presented here.

There are limitations by only analyzing Canadian laws, analyzing just one (federal) Canadian law and analyzing documents that exclude numerous taxonomic groups. However, these scope restrictions are necessary for a master's thesis and the study's author presents an argument that reduces the impact from these limitations: the study's objective to explore the implications of ESL on biodiversity protection law is but one of two key objectives, the other being to explore the real-world application of an ESL perspective. Since both objectives cannot be simultaneously pursued to the greatest lengths possible for a master's thesis but still need to be achieved in a manner that can be argued as impactful, it was deemed reasonable for these particular scope restrictions to exist. Also, given the young age of ESL's body of research, this study's scope remains impactful even if its conclusions were to be limited to Canada or challenged by the inclusion of other relevant Canadian laws.

As Bengtsson (2016) notes, making mistakes in the process of data analysis is never impossible. An additional coder would have enhanced the study's validity and reliability by ensuring results are similar across different researchers (Bengtsson, 2016), but this is not practical for a master's-level study.

4 Results

In line with the ESL conceptual framework shown in Figure 1, the results are primarily organized according to the three major elements of ESL: Complexity, Inclusivity and Interdependencies. This allows for each code's results to be presented within the context of its ESL element and for the results in general to be more clearly tied to displays of support or contradiction for ESL's applications of complexity, inclusivity and interdependencies (and thus ESL as a whole). Results were also evaluated according to document type and specific document, allowing for any key trends regarding these characteristics to be identified.

4.1 Quantitative Results

Tables 4, 5 and 6 show the coding results for Complexity codes, Inclusivity codes and Interdependencies codes, respectively. Collectively, the tables represent the study's quantitative coding data, providing the total number of code applications for each major ESL element, the number of times each code was applied and the number of individual and total code applications for each document as well as document type. From these tables, Complexity codes collectively saw the most applications while Interdependencies codes collectively saw the least. Three codes had more than one thousand applications (Natural Systems, Present-Day Non-Humans and Humans vs. Non-Humans) while four codes had fewer than ten applications (No Complexity, Missed Opportunity, Future Humans and No Interdependencies). Three of these codes applied fewer than ten times (all but Future Humans) were abandoned early in the coding process as they proved overly difficult to apply and less valuable to the study than expected (leaving 21 codes to produce meaningful data). RS+APs saw the most code applications of the document types while Mgmt. Plans saw the least (in general and for each

ESL category), and Woodland Caribou saw the most of any document while Pygmy Snaketail saw the least (in general and for each ESL category).

Table 4. Coding results for the ten Complexity codes.

CODING RESULTS			Code Type	Complexity									
			Codes	Adapting	Info Gaps	Info Reliability	Human Systems	Natural Systems	No Adapting (Typical & Predictable)	Nonlinearity	Precautionary	Tipping Points	No Complexity
Document Types	Documents	Totals		4844									
				282	710	563	853	1031	821	63	464	50	7
Legislation	SARA	501	501	6	32	104	141	39	106	0	66	7	0
Multi-Species Action Plans	Banff NP	1180	169	12	22	5	39	33	39	1	17	1	0
	Rouge NUP		287	18	42	34	55	66	57	0	15	0	0
	Georgian Bay Islands NP		92	3	9	2	27	16	22	0	13	0	0
	Grasslands NP		244	14	33	32	35	61	49	1	18	1	0
	La Mauricie NP		388	12	102	1	73	64	69	0	62	1	4
Management Plans	Eastern Wolf	717	239	14	49	21	35	76	23	4	13	3	1
	Five-Lined Skink		111	1	20	10	18	38	14	0	10	0	0
	Monarch Butterfly		145	1	27	6	26	53	20	4	5	1	2
	Pygmy Snaketail		83	2	17	4	13	23	14	0	10	0	0
	Western Toad		139	1	25	7	28	43	14	0	21	0	0
Recovery Strategies + Action Plans	Blanding's Turtle	2446	415	34	60	62	57	86	69	10	32	5	0
	Leatherback Turtle		468	25	80	71	94	94	69	0	32	3	0
	Black-Tailed Prairie Dog		326	31	44	34	47	89	40	10	26	5	0
	Sable Island Sweat Bee		171	0	39	2	21	62	26	4	16	1	0
	Woodland Caribou		1066	108	109	168	144	188	190	29	108	22	0

Table 5. Coding results for the nine Inclusivity codes.

CODING RESULTS			Code Type	Inclusivity								
			Codes	Present-Day Humans	Present-Day Non-Humans	Potential	Normative	Missed Opportunity	Geographic Areas	Greater Timescales	Future Humans	Future Non-Humans
Document Types	Documents	Totals		3051								
				610	1389	101	415	7	197	230	7	95
Legislation	SARA	333	333	97	107	5	114	0	7	2	0	1
Multi-Species Action Plans	Banff NP	827	115	30	53	5	14	1	1	9	1	1
	Rouge NUP		209	61	84	3	39	0	3	12	2	5
	Georgian Bay Islands NP		59	15	27	1	13	1	0	2	0	0
	Grasslands NP		141	18	74	9	18	1	2	12	0	7
	La Mauricie NP		303	83	146	29	24	1	0	20	0	0
Management Plans	Eastern Wolf	511	133	22	76	1	13	0	7	12	0	2
	Five-Lined Skink		62	3	35	2	7	0	12	3	0	0
	Monarch Butterfly		161	19	55	10	12	2	45	13	0	5
	Pygmy Snaketail		50	8	29	2	5	0	5	1	0	0
	Western Toad		105	12	59	4	6	0	12	8	0	4
Recovery Strategies + Action Plans	Blanding's Turtle	1380	226	42	103	2	20	0	5	32	2	20
	Leatherback Turtle		326	59	136	11	29	0	66	20	0	5
	Black-Tailed Prairie Dog		215	38	108	1	15	1	22	22	0	8
	Sable Island Sweat Bee		111	16	70	1	7	0	2	10	0	5
	Woodland Caribou		502	87	227	15	79	0	8	52	2	32

Table 6. Coding results for the five Interdependencies codes.

CODING RESULTS			Code Type	Interdependencies				
			Codes	Humans vs. Earth	Humans vs. Non-Humans	Present vs. Future	Geographic Areas	No Interdependencies
Document Types	Documents	Totals		1990				
				287	1424	114	165	0
Legislation	SARA	185	185	39	139	3	4	0
Multi-Species Action Plans	Banff NP	558	75	17	53	3	2	0
	Rouge NUP		133	40	87	3	3	0
	Georgian Bay Islands NP		35	7	28	0	0	0
	Grasslands NP		103	20	75	5	3	0
	La Mauricie NP		212	12	196	2	2	0
Management Plans	Eastern Wolf	380	99	8	78	6	7	0
	Five-Lined Skink		34	3	31	0	0	0
	Monarch Butterfly		154	8	92	8	46	0
	Pygmy Snaketail		34	8	26	0	0	0
	Western Toad		59	4	45	5	5	0
Recovery Strategies + Action Plans	Blanding's Turtle	867	143	31	86	18	8	0
	Leatherback Turtle		184	12	121	6	45	0
	Black-Tailed Prairie Dog		149	22	93	14	20	0
	Sable Island Sweat Bee		97	16	63	10	8	0
	Woodland Caribou		294	40	211	31	12	0

4.2 Qualitative Results

As mentioned, the study's quantitative coding data only provides surface-level insights. The primary results for answering the research questions, including the themes revealed by each code's array of applications and the analysis of how SARA expresses each theme, are provided in detail in the Appendix. To summarize these primary results, 172 total themes were established across 21 codes and each theme's relative contribution to the total applications for its corresponding code were determined. Upon analyzing these themes and how they are expressed by SARA, it was determined that while ESL is supported to varying extents in numerous instances, SARA primarily misaligns with ESL. This is shown through both directly and indirectly opposing various ESL principles and characteristics as well as failing to discuss ideas associated with ESL in a manner befitting a full ESL perspective. This overarching misalignment is displayed unequally across the codes but is most strongly indicated by fourteen of the 21 codes, including six of the nine Complexity codes (Info Reliability, Human Systems, Natural Systems, No Adapting – Typical & Predictable, Nonlinearity and Tipping Points), three of the eight Inclusivity codes (Future Humans, Geographic Areas and Normative Inclusivity) and all four Interdependencies codes (Geographic Areas, Present vs. Future, Humans vs. Earth and Humans vs. Non-Humans). This pattern suggests that SARA misaligns most with complexity and interdependencies as two of the three foundational aspects of ESL. Also, the overarching misalignment is displayed unequally across the documents but is most clearly shown in the Mgmt. Plans, and ultimately all documents lacking special significance to humans (contrasting the likes of La Mauricie NP and Woodland Caribou). Finally, SARA is limited in its expression of biocentric and ecocentric perspectives, offering greater examples of human-centric valuations

of living beings and ecosystems according to thematic analyses for the following codes: Natural Systems, Precautionary, Tipping Points, Present-Day Non-Humans, Future Non-Humans, Humans vs. Earth and Humans vs. Non-Humans. This continued prioritization of humans over the Earth system and its other inhabitants contributes to SARA's overarching misalignment with ESL.

Before describing the qualitative results for each of ESL's three major principles, detailed examples will be provided to outline SARA's ability to align and misalign with ESL, respectively. First, SARA displays ESL alignment through many expressions of the code Future Non-Humans. Regarding future non-humans as an aspect of inclusivity in ESL, it is crucial from an ESL perspective to meaningfully include (thoroughly consider the perspectives and well-being of) these participants in the Earth system to support two key ESL objectives. The first is to establish non-human species as subjects of justice considered equal to humans, and the second is to account for the bias that favors the present over the future so that decisions and their outcomes are beneficial to those in the future as well. Ultimately, including future non-humans will lead to more sustainable outcomes across the Earth system. SARA often includes future non-humans in a manner that supports ESL by deeply incorporating their well-being into all layers of wildlife conservation (from vision to plans, plans to action and action to evaluation) to the extent that only considering present-day non-humans is viewed as unproductive. A key theme of Future Non-Humans in SARA is Long-Term Persistence – General, and the majority of this theme's expressions by SARA mention a species' long-term persistence as a necessary part of conservation, particularly in terms of the overarching philosophies of and goals for a species' conservation which is necessary to foster more sustainable outcomes for that species. This is

showcased in the examples below, including segments from Leatherback Turtle (RS+AP) and Black-Tailed Prairie Dog (RS+AP) respectively that are both associated with the theme (and code) in question:

"What is recovery? In the context of species at risk conservation, recovery is the process by which the decline of an endangered, threatened, or extirpated species is arrested or reversed and threats are removed or reduced to improve the likelihood of the species' persistence in the wild. A species will be considered recovered when its long-term persistence in the wild has been secured." – Leatherback Turtle, first page after the title page.

"The population and distribution objective is to ensure, by 2040, at least 80% probability of persistence of the Canadian Black-tailed Prairie Dog population over 50 years (i.e., 2040-2090) within its known range in Canada…" – Black-Tailed Prairie Dog, first page of the Executive Summary.

These segments of text are clear examples of SARA's instruments meaningfully including future non-humans (and thus a key aspect of inclusivity) in alignment with ESL. This is because they consider the well-being of future non-humans as a mandatory element and goal of a species' conservation, focusing on the benefits granted to the species itself (rather than humans) from this consideration.

SARA displays misalignment with ESL through many expressions of the code Humans vs. Earth. SARA generally focuses on how Earth depends on humans, outlining how humans are

supremely capable of helping or harming the Earth's well-being (in general or through certain aspects of Earth's system), instead of presenting humans and Earth as equal participants in an interdependent relationship and drawing a fair share of attention to the inherent dependence humans have on Earth. The latter aligns with ESL because it challenges the notion that humans are Earth's superior being and ultimately enhances our ability to recognize and address Earth system disruptions through sustainable solutions. SARA fails to align with ESL in this regard, as the theme Earth Relying on Humans for Protection/Mgmt. (for the code Humans vs. Earth) makes up 86% of the code's applications. A clear expression of this theme is provided below.

"Banff National Park is situated within a large protected area complex – the Canadian Rocky Mountain Parks World Heritage Site. Its western and northern borders are functionally invisible, as similar levels of habitat protection occur within adjacent protected areas. The eastern and southern boundaries of the park, however, are potentially more significant for species conservation as adjacent lands are managed for a variety of different land uses that affect habitat in various ways. Forest harvesting, wildfire suppression, suburban development, motorized recreation, ranching, gravel extraction, mining, and roads are significant contributors to landscape change in the surrounding area. The Ya-Ha-Tinda Ranch is separated from the larger protected area and is surrounded by provincial Crown land. Collaboration with adjacent land managers and owners will be important to conserving cross-boundary species at risk." – Banff National Park (MSAP), page 5, first paragraph of Section 3.

This segment of text illustrates SARA's focus on how Earth depends on humans, specifically regarding the protection of natural spaces through established protected areas and the ability for various human activities to manipulate entire landscapes.

4.2.1 Complexity

At times, SARA displays alignment with ESL's principle of complexity, primarily through the expressions of the codes: Info Gaps, Adapting and Precautionary. This is strongly shown through expressions of the themes Win-Win Scenarios: Adapting to Live With Nature (for the code Adapting), Accepting Limitations in Knowledge Acquisition (for the code Info Gaps) and Interim or Enhanced Recovery Efforts (for the code Precautionary). To summarize its ESL alignment in this context, SARA has occurrences where it clearly depicts the need for adapting to Earth system complexity and where it embraces the fact that humans cannot possibly know everything about the Earth system to make decisions. Also, there are times where SARA faces uncertainty by outlining specific precautionary actions to take for conservation purposes. Together, these examples showcase an extent of SARA's ability to acknowledge and productively address uncertainty in the Anthropocene, in alignment with ESL.

However, SARA also displays heavy reliance on knowledge already gained, knowledge to be gained in the future or outright assumptions, opting not to embrace complexity and its accompanying uncertainty in the fullest sense. In general, SARA works against complexity in ESL more often than not, such as through expressions of the themes Things Staying the Same (for the code Info Reliability), Population & Distribution Objectives - Optimal Scenarios (for the code Natural Systems), Permanent Alterations or Irreversible Damage (for the code Tipping Points) and all themes for No Adapting. To summarize this misalignment with ESL, SARA often makes

assumptions regarding the reliability of current information and the unlikelihood for circumstances to change – assumptions that cannot be validated to a reasonable degree in the context of a complex Earth system in the time of the Anthropocene. Also, SARA often oversimplifies natural systems, avoids the concept of tipping points or is overly general in their mention and perceives various scenarios surrounding wildlife conservation as predictable (suggesting little to no need for adaptation). Altogether, this outlines how SARA largely misaligns with ESL's principle of complexity.

4.2.2 Inclusivity

SARA displays support for ESL's principle of inclusivity in numerous instances, primarily through the expressions of four codes: Present-Day Humans, Present-Day Non-Humans, Greater Timescales and Future Non-Humans. This is best shown through expressions of the themes Consider Input/Participation From Indigenous (for the code Present-Day Humans), Considering Their Intrinsic Value (for the code Present-Day Non-Humans), Multiple Generations (for the code Greater Timescales) and all seven themes for Future Non-Humans. To summarize its ESL alignment in this context, SARA has instances where it meaningfully includes underserved human populations in conservation decision-making and instances where it speaks to the intrinsic value of wildlife. Also, there are times where SARA explicitly mentions the well-being of future generations of human and non-human beings as a key part of legal plans and actions, and where the well-being of future non-humans in particular is expressed as a foundational aspect of successful conservation.

However, these aspects of inclusivity in ESL are not supported by SARA consistently or in their fullest sense in every instance. As well, there are other aspects of inclusivity in ESL that

SARA generally contradicts, namely those revealed by the majority of themes for the codes Future Humans, Geographic Areas and Normative Inclusivity. Specifically, SARA misaligns with ESL's principle of inclusivity by almost never meaningfully including future humans, rarely including different geographic areas in a manner that unites them under one planetary system and upholding the disproportionately high degree of inclusion and influence granted to governments and their representatives. With this, SARA primarily misaligns with ESL's principle of inclusivity.

4.2.3 Interdependencies

Across all documents, SARA offers little support for ESL's principle of interdependence. Misalignments with ESL in this context are prominently displayed through expressions of all four Interdependencies codes, especially via the themes Knowledge and Data Sharing (for the code Geographic Areas) and Species Gaining From Our Actions (for the code Humans vs. Non-Humans). Specifically, SARA often speaks too generally regarding the relationships between geographic areas and displays a human bias with any interdependency involving humans, such that the focus is put on the influence had by humans while those they have interdependent relationships with are not considered equal participants. Overall, SARA misaligns considerably with ESL's principle of interdependence.

5 Discussion

5.1 Introduction

The following research questions are addressed in this section:

2. What are the implications of ESL for biodiversity protection law, revealed by a directed content analysis of SARA's legislation and instruments for implementation?

   a. To what extent does SARA exhibit principles and characteristics of ESL?

   b. In what ways does SARA contradict principles and characteristics of ESL?

   c. What measures could be taken to better incorporate ESL principles and characteristics into biodiversity protection law?

4. How do the ecocentric and biocentric approaches to valuing non-human species play a role in ESL's application towards SARA?

This study involved analyses and interpretations that produced a large amount of data for each code. This section will simplify the findings for a given code, with expanded analyses provided in the Appendix. ESL is inherently holistic such that its full application must include all of its characteristics (inclusivity, complexity and interdependencies and all aspects within each major element) as all of these items collectively, but not individually, define ESL as a concept. Thus, the analysis of SARA's association with ESL must consider the results across all codes or ESL aspects together, therefore this section centers around this approach while the discussion of individual codes (a key first step to evaluating results across all codes together) is generally limited to the Appendix.

5.2 Research Question 2a

Fully aligning with ESL ideally involves exhibiting every ESL characteristic as an interconnected whole and, for each ESL characteristic, exhibiting it in full accordance with an ESL perspective in every instance. For example, if inclusivity for present-day and future non-humans is exhibited but using adaptation as a response to complexity is never exhibited, then this is a form of incomplete rather than full alignment with ESL. Also, if inclusivity for present-day and future non-humans is exhibited in a number of instances but the majority of these instances express such inclusivity as less valuable than the inclusivity of humans, then this is also a form of incomplete rather than full alignment with ESL. The primary criteria to fully align with ESL is threefold, the first being the inclusion of all living things in the Earth system in the present and future, accounting for inequities and unique vulnerabilities and contexts so that the Earth system as a whole and all its participants are equally valued as subjects of justice. The second is the consideration of all interdependent relationships between different participants in the Earth system, including each participant's needs for both survival and a dignified life and how meeting those needs relies on other participants. The third is the acknowledgment of the myriads of complex interactions and processes across the entire Earth system and within natural and human systems respectively, using acknowledgements to adapt and make better decisions in a world full of uncertainty for the equal benefit of all Earth system participants in the present and future.

SARA does not exhibit every ESL characteristic as an interconnected whole nor does it exhibit any particular ESL characteristic in full accordance with an ESL perspective in every instance. However, there are many instances where SARA exhibits certain characteristics of ESL

to extents that are either partially or completely aligned with an ESL perspective. This includes the following ESL characteristics: adapting, information gaps and precaution as aspects of complexity in ESL, and greater timescales, future non-humans, present-day humans and present-day non-humans as aspects of inclusivity in ESL. Thus, SARA exhibits characteristics of ESL to a rather limited extent that at least lays the foundation for greater or even complete ESL alignment to be incorporated in the future.

Instances of partial alignment with ESL are most strongly showcased through the ESL category Inclusivity, such as how SARA includes future non-humans in various instances. Notably, SARA focuses on non-human species in general, but this does not guarantee that future beings will be properly considered as well. SARA could still improve its support for ESL in the context of future non-humans by being more specific about the future time period being mentioned (and thus being more explicit when discussing future non-humans as distinctive from present-day non-humans). SARA could also improve in this context by ensuring the future non-humans of all species are equally mentioned and treated as valuable, regardless of the species' life-span or apparent significance to humans. This illustrates the partial nature of SARA's already limited alignment with ESL and outlines specific gaps to address when seeking full ESL alignment.

Considering all ESL characteristics most strongly exhibited by SARA (listed above), SARA does well in numerous instances (from an ESL perspective) to: meaningfully include present-day Earth system participants, consider the future circumstances in the Earth system, acknowledge the many things unknown to humans regarding the complex Earth system and respond appropriately to the Earth system's complexity and uncertainty by exercising precaution and

adaptation. Collectively, these items amount to a significant portion of ESL, though there are many additional aspects required to complete the transformative framework that defines ESL.

ESL prioritizes the meaningful inclusion of all present-day Earth system participants equally (addressing inequities amongst humans and between humans and non-humans) to ensure all legal decisions and outcomes reflect the circumstances of all beings on Earth today. Through this, positive well-being is achieved for all, which benefits the entire Earth system. This aspect of ESL is represented by the codes Present-Day Humans, Present-Day Non-Humans and Geographic Areas. SARA sometimes aligns with ESL in this context, best shown through two avenues. First, efforts are made to ensure outcomes benefit Indigenous groups and other groups of people equally, and benefit non-humans through the impactful perspectives offered by Indigenous people. Second, SARA offers numerous acknowledgements of non-humans' intrinsic value, the purest and most ESL-supportive driver for meaningfully including non-humans. In contrast, though, SARA does better to meaningfully include these Earth system participants at different times as distinctive types of living beings rather than as equals to be meaningfully included simultaneously in a given circumstance. Thus, SARA often includes present-day beings per ESL but ultimately upholds the historical and current favoring (in legal systems and beyond) of humans over non-humans. As well, SARA generally fails to align with ESL through Geographic Areas, often limiting its inclusion of present-day Earth system participants to those in Canada. This excludes opportunities to unite geographic areas under one Earth system and to promote the notion that all areas on the same planet are collectively impacted by any one area's problems and potential solutions. Still, there are many instances where SARA exhibits ESL's characteristic of including present-day beings in partial or full

accordance with an ESL perspective, offering some of the benefits that ESL seeks through enhancing inclusivity.

Considering the future circumstances in the Earth system (including the well-being of humans and non-humans only existing in the future) is crucial to ESL as its goal is to achieve better outcomes for the entire Earth system and all its participants in the present *and* future. This involves acknowledging that achieving better outcomes in only one of those time periods is insufficient, as the present and future are inherently linked, and the Earth system will suffer in general if only the present or future is prioritized. This ESL characteristic is represented by the Inclusivity codes Greater Timescales, Future Non-Humans and Future Humans. At times, SARA aligns with ESL in this context. This is best shown through SARA's explicit mentions of future generations of species that outline how the well-being of numerous generations must be considered in conservation planning, and through SARA's meaningful inclusion of future non-humans specifically (with a detailed example provided in Qualitative Results). However, SARA largely excluded future humans from conservation plans and actions, rendering SARA's consideration for future circumstances and future beings incomplete. Overall, there are instances where SARA supports ESL by meaningfully considering the Earth system's (including some of its participants') future as a key part of present-day legal efforts, but SARA did not do this equally for humans and non-humans and often lacked appropriate levels of specificity and consistency in general when considering the future.

A key part of ESL is acknowledging the many things unknown to humans across the Earth system and responding appropriately to uncertainty through precaution and adaptation. This is because an ESL perspective considers Earth a complex system made up of countless

complex elements and interactions, and legal systems will ultimately be ineffective so long as specific complexities and the complex state of the Earth are not fully acknowledged. The reasoning is legal plans and actions will oversimplify things instead of accurately reflecting circumstances on Earth, producing outcomes that are inadequate for the Earth system through time. This acknowledgment does not equate to fully comprehending every aspect of the Earth system's complexity (though to a degree it remains reasonable to attempt to acknowledge *and* fill some knowledge gaps in order to make more informed decisions, and it is not necessarily clear how far these attempts should go to stay aligned with ESL). Instead, according to ESL, it should involve accepting states of complexity rather than pursuing simplification or willful ignorance, including the inability to comprehend everything and thus accepting the inherent uncertainty woven across our world, and accounting for the uncertainty as best we can by adapting to the complexity of our reality and exercising precaution. This characteristic of ESL is represented by the Complexity codes Adapting, Info Gaps, Info Reliability, Nonlinearity and Precautionary. There are occurrences where SARA aligns with ESL in this context, the most prominent being those where SARA: acknowledges key justifications for and the overall benefit of adaptation, admits to limitations regarding human knowledge acquisition and opts for precautionary conservation measures amidst uncertainty. Together, these occurrences reveal that SARA is at least capable of acknowledging unknowns in a complex Earth system and crafting productive responses to complexity or uncertainty according to an ESL perspective. However, SARA still devotes most of its efforts to knowing what's unknown rather than committing outright to accepting uncertainty and fully embracing principles of precaution and adaptation. Perhaps this is simply human instinct – to want to understand something

completely or not at all, or to believe one needs all relevant information to make any impactful decision. As alluded to, it would not be reasonable for ESL alignment to equate to abandoning knowledge acquisition for better decision making. Regardless of the reason, though, one cannot rely too heavily on knowledge already acquired or knowledge to be acquired in the context of a complex Earth system, and SARA's alignment with ESL's principle of complexity is only partial because of this.

Overall, SARA exhibits various ESL characteristics and there are many instances where it does so in a manner befitting a partial or full ESL perspective (for a given characteristic – particularly those to do with including present-day beings, including Earth's future and acknowledging unknowns in a complex world while responding via adaptation and precaution). However, SARA does not do this to an extent that displays complete alignment with ESL in general. This offers clarity in that SARA is not completely removed from ESL and already relates to ESL in some regard without any intentional incorporation of the concept, though this relation is limited to a select few ESL characteristics and even for those characteristics, SARA is considerably inconsistent and limited in fully expressing an ESL perspective.

5.3 Research Question 2b

Contradicting ESL principles and characteristics can be displayed in many different ways, whether it's to do with inclusivity, complexity or interdependencies per an ESL perspective. Generally, this either looks like ignoring a key aspect of ESL (e.g. lacking any words or actions to directly or indirectly include present-day non-humans) or involving a key aspect of ESL but in a manner that represents the antithesis of or apparent disruptor to the expression of that aspect from a full ESL perspective (e.g. explicitly mentioning present-day non-humans as beings not to

be meaningfully included or speaking to circumstances that will ultimately limit the occurrence or significance of their meaningful inclusion).

Through various means, SARA works against the majority of ESL characteristics that were outlined in this study and represented by codes, either generally or in select instances depending on the characteristic. This is most strongly showcased through the ESL principle of interdependence, where SARA generally upholds the problematic bias that deems humans as overly significant instead of equal members in an interdependent relationship. As a consequence, SARA reduces its own ability to consider and ultimately benefit humans, non-humans and Earth equally.

Considering all codes or aspects of ESL that SARA worked against in some capacity (nearly all codes aside from those outlined for Research Question 2a), it can be summarized that ESL generally worked against: meaningfully including future humans and geographic areas (besides Canada), fully acknowledging Earth system complexity (and the associated unpredictability as well as boundaries to avoid irreversible changes) through human systems, natural systems and regarding information reliability, fully committing to adaptation as an effective response to said complexity and genuinely recognizing major interdependencies in the Earth system (between geographic areas, the present and future, humans and Earth and humans and non-humans).

Regarding inclusivity, ESL's intention is to expand those considered subjects of justice (from primarily just humans) to ensure legal systems equally benefit all participants in the Earth system (and this system altogether) now and through time. This endeavor necessitates the meaningful inclusion of future humans across the Earth system so that legal plans and actions

consider, and ultimately produce outcomes that support, the well-being of humans beyond those alive today. It also necessitates including all living beings on Earth in general regardless of their geographic location. Together, this addresses the historical and current biases that favor either or both present-day beings over those of the future as well as specific geographic areas versus the uniting of many or all areas under the same Earth system. These aspects of inclusivity in ESL are represented by the Inclusivity codes Future Humans and Geographic Areas. In general, SARA works against these aspects of inclusivity in ESL, most prominently outlined in two main ways. The first is in regard to future humans, as not only are there fewer than ten instances where they are included, but each instance involves few words and oftentimes it is tacked on to a sentence speaking to present-day humans or a general list of human-specific benefits from wildlife. This essentially reduces the consideration of future humans to an afterthought instead of a topic worthy of discussion, suggesting a problematic exclusion of future humans that could lead to outcomes that negatively impact this Earth system participant. This is an interesting finding given that this is more often the concern for non-humans than humans, which might be explained by the fact that SARA's overarching purpose is to support non-humans rather than humans, and any elements addressed to humans are more likely to focus on those in the present than the future given the general bias for the former over the latter time period. Still, to align with ESL, future beings of all kinds must be meaningfully included and done so consistently, as the earth system perspective exaggerates the notion that the matters of one group (humans vs. non-humans, present vs. future) is linked to that of another under one Earth system. The second is in regard to geographic areas, where SARA often just states facts (such as which country or continent a species can be found in) instead of

meaningfully including different geographic areas, or else includes geographic areas but in a manner that is too general or that maintains the notion that geographic areas are distinct from one another instead of united within one Earth system (making it unlikely that any legal plans and actions will benefit many or all geographic areas at once). In current regimes for governance and legal systems in Canada and around the world, there are jurisdictional issues and restrictions with addressing transboundary impacts on at-risk species that suggest an inherent inability for laws such as SARA to include geographic areas in line with ESL. However, it remains important that the analysis outlines this gap from an ESL perspective, drawing attention to it and its potential elimination. Also, SARA could still do more by speaking to the unification of geographic areas under one earth system and perhaps even offering hypothetical evaluations of conservation issues and their solutions as though no jurisdictional issues exist.

Speaking to complexity, ESL aims to embrace the undeniably complex nature of Earth and all its aspects (including human and natural systems as two distinctively complex aspects of Earth that should individually and collectively be acknowledged). Through this, legal plans and actions can better reflect rather than ignore or misalign with the actual circumstances they are situated in, ultimately enhancing the ability for legal systems to bring about outcomes that are genuinely suitable for the Anthropocene and Earth system in general. Embracing the Earth system's complexity inherently involves embracing nonlinearity and tipping points, as they are both key aspects and consequences produced organically from this overarching complexity. Specifically, nonlinearity represents the unpredictable nature of various aspects of Earth and tipping points represent how circumstances will irrevocably change should certain parameters be adjusted beyond some threshold. Embracing complexity also involves questioning the

reliability of information in a highly complex environment and adapting to reliable information being difficult to acquire. Altogether, these aspects of ESL are represented by the Complexity codes Info Gaps, Info Reliability, Human Systems, Natural Systems, Nonlinearity and Tipping Points. In general, SARA works against these aspects of ESL. One of the key ways this is illustrated is through SARA's common practice of assuming that circumstances (regarding a species, habitat, ecosystem or the Earth system as a whole) will stay the same, making it so any current information is considered completely reliable and not even potentially problematic, which contradicts the nature of both the Anthropocene and Earth system. Another key way is through SARA's general depiction of natural systems that reduces them and their complexities down to more simplistic objectives, describing optimal states of these systems that humans can play a role in establishing and maintaining and providing pathways forward that rely on natural systems being comprehensible and even controllable (now and through time, which contradicts the reality of nature and the Earth system). A third avenue is through SARA's mention of tipping points, given that SARA never uses the term itself and never alludes to tipping points at the Earth-system level (speaking only to those at the species or habitat level). Oftentimes, SARA leaves the determination of something being a contributor to a tipping point up to the discretion of select (potentially biased or unqualified) humans, while also discussing any implications from tipping points in an overly general and unclear manner, minimizing the perceived impact from avoiding such points. Altogether, this showcases SARA's preference to simplify the Earth system and avoid the realities brought about from the system's inherent complexity, ultimately limiting SARA's ability to fully acknowledge let alone address conservation issues in a manner that benefits the entire Earth through time.

As described for Research Question 2a, adapting to complex circumstances and their resulting uncertainties is a key aspect of ESL. While SARA offers support for aspects like adaptation and precaution in certain contexts, SARA avoids fully committing to adaptation as a response to the Anthropocene. This is made clear by SARA commonly suggesting that the positive and negative impacts that recovery efforts (or a lack thereof) will have on wildlife or nature are predictable and don't require us to adapt in some manner. In most cases, SARA did not outright state something as being predictable, but it was suggested by providing confident statements without outlining any need to address potential or actual uncertainty. SARA's inability to fully embrace uncertainty and the value of adaptation enhances the likelihood that its efforts will be met with unexpected circumstances that minimize its overall impact, forcing SARA to make adjustments that are too slow to keep up with (let alone solve) the growing problem of the biodiversity crisis.

Recognizing major interdependencies in the Earth system is the third major principle of ESL that essentially combines the other two principles (by simultaneously considering the needs or well-being of different Earth system participants and acknowledging the complexities of the Earth system through distinctively complex interdependent relationships between participants). In doing so, ESL enhances the ability for legal plans and actions to bring about sustainable outcomes that benefit the entire Earth system, as it outlines the specific ways that different aspects or participants in the Earth system are intrinsically connected to explain why they can all be considered part of a single planetary system in the first place. This principle of ESL is represented by the Interdependencies codes Geographic Areas, Humans vs. Earth, Humans vs. Non-Humans and Present vs. Future. As mentioned, SARA primarily works against this major

element of ESL. For one, SARA is often overly general in discussing relations between geographic areas and limits discussion to just areas currently known to house a certain species. This ultimately limits the ability for any acknowledgement of interdependency to foster better outcomes for the Earth system by failing to deeply explore the interdependency. It also excludes interdependencies that would have showcased how all kinds of geographic areas depend on one another in the Earth system even without having such apparent similarities (knowingly housing the same species). The misalignment is also shown through SARA's focus on how non-humans depend on humans, failing to properly and consistently recognize humans and non-humans as equal participants in an interdependent relationship. Across SARA, the well-being of non-humans is depicted as heavily dependent on the thoughts and actions of humans, without any clear or consistent indication that this recognition will genuinely promote or ensure the well-being of non-humans to the greatest extent possible (primarily due to complexities in human systems and seemingly unaddressed human biases). Also, SARA made little effort to mention or address inequities amongst humans or amongst non-humans to ensure all participants in the interdependent relationship are meaningfully included. Altogether, this illustrates SARA's inadequacy with recognizing the Earth system's key interdependent relationships, resulting in legal plans and actions that separate rather than unify different entities and that perpetuate the false understanding that humans are not heavily dependent on the well-being of non-humans, every geographic area and Earth as a whole to survive. Ultimately, this produces outcomes that favor select humans and fail to do enough for any other Earth system participant (and therefore the entire system itself).

Overall, SARA works against numerous ESL principles and characteristics (particularly those to do with including future humans and geographic areas, fully acknowledging Earth system complexity as well as interdependencies and fully committing to adapting in response to Earth's complexity). This is done to a substantial degree, outlining how SARA is far from complete alignment with ESL. This offers clarity regarding which ESL aspects SARA misaligns with the most and how SARA can relate to ESL's principle of inclusivity but struggles to build a foundation with ESL's other two major principles.

5.4 Research Question 2c

As SARA does not completely align with ESL in the ideal sense described, there are numerous measures to be taken to better incorporate ESL principles and characteristics into biodiversity protection laws as a pathway towards complete alignment. For simplicity, these laws will be referred to as BPLs in this section.

To better align with ESL's principle of inclusivity, it is recommended that BPLs considerably enhance the meaningful inclusion of the future and its inhabitants as well as different geographic areas. When doing so, it is key to showcase the importance of incorporating such elements in legal plans and actions even when circumstances initially deem the present-day or a particular geographic area as most relevant to a scenario. This looks like mentioning these elements more often in general and outlining the specific ways they can both influence decisions and be impacted by outcomes. In general, it is recommended here that BPLs meaningfully include all Earth system participants in the present and future such that participants are valued equally and any biases that favor the well-being of select groups (such as for humans over non-humans) are eliminated. Ultimately, no plans or actions should rely on

the perspectives of a single Earth system participant, and no desired outcomes or drivers should be centered around the well-being of a single participant. Across BPLs, instances of prioritizing the inclusion of humans over non-humans, and governments and their representatives over other humans, require removal so that sustainable outcomes are realized across the Earth system. Overall, though, SARA did better to incorporate the ESL principle of inclusivity and its characteristics compared to the remaining two ESL principles, so there are relatively fewer measures to be taken to align BPLs with ESL in this regard.

In terms of better aligning with ESL through its principle of complexity, it is recommended here that BPLs adjust how they portray and perceive complexity in the Earth system and for particular aspects of the system. The new objective for BPLs, in any given instance, is to consider complexity as a state of existence to be acknowledged and embraced rather than one to be simplified or completely understood for human purposes (as if humans can exclude elements of reality or gain enough control of it to make seemingly informed decisions and avoid certain consequences as actors in the Earth system). Perceiving complexity as inherent to achieving balance or positive circumstances across the entire Earth system, ultimately making legal plans and actions within the framework of complexity that supports this balance, is key to applying an Earth system perspective (and bringing about outcomes that genuinely support the entire system through time). This must be showcased more clearly and more often throughout BPLs, reflected in how they perceive natural systems and the efforts to understand and protect non-human species, as well as the treatment of human system characteristics as immobile obstacles against effective conservation. Another measure recommended here is for BPLs to more definitively and consistently showcase adapting as the

primary response to Earth system complexity. There must be considerably fewer instances of directly or indirectly referencing circumstances as being typical or predictable, and these are routinely replaced with plans and actions that display acceptance of uncertainty and full cooperation at an Earth-system level.

Regarding ESL's principle of interdependency, it is recommended here that BPLs adjust how they portray relationships in the Earth system, especially regarding how humans relate to others including the Earth itself. The objective is for BPLs to have no instances where humans are idolized or treated as an Earth system participant that can operate let alone thrive in isolation from other participants, or in other words impact others more than they can be impacted by others. Also, the relationships represented by the four Interdependencies codes are to be included as a key part of any legal plans and actions and fully acknowledged as inherently interdependent, such that the dignified life brought about through interdependence is considered equally important for all Earth system participants through time. Currently, SARA has many instances where it favors the dignified life of humans over that of others and, overall, SARA does not adequately incorporate certain interdependencies per an ESL perspective, including those between the present and future and those between geographic areas.

ESL's three major principles operate together as an interconnected trio. Therefore, having BPLs take measures to better align with any one of ESL's principles (per the recommendations described above) promotes the adoption of all measures pertaining to the remaining principles and a more complete alignment with ESL altogether.

As a recommended measure to better incorporate all principles and characteristics of ESL in general, BPLs should ensure that the alignment with ESL is consistently distributed across

all document types and individual documents so that no particular instrument sees more or less ESL alignment (of a certain form or in general) than another. Currently for SARA, RS+AP documents have the greatest incorporation of ESL principles and characteristics while Mgmt. Plans have the least. Also, there is seemingly a greater alignment with ESL in documents speaking to more charismatic species and species that presently have a greater significance to humans in general (such as Woodland Caribou). Ultimately, enhancing the outcomes for the entire Earth system through time (per ESL's objective) cannot be achieved unless all legal plans and actions (all elements of a legal system) are equally committed.

5.5 Research Question 4

Per the Literature Review, ecocentric and biocentric approaches to valuing non-human species speak to the value non-humans bring through ecosystem services and simply existing, respectively. Further, these approaches do not characterize ESL in its entirety but are inherently part of an ESL perspective as they recognize non-humans' role in a complex Earth system and meaningfully include them as an irreplaceable Earth system participant. These approaches are considered to be represented by the codes Natural Systems, Precautionary, Tipping Points, Present-Day Non-Humans, Future Non-Humans, Humans vs. Earth and Humans vs. Non-Humans. In general, SARA maintains a human-centric perspective that holds humans in a higher regard than non-humans, thus misaligning with ESL in this context. This is best shown through comparing the extents and formats in which SARA explicitly outlined different valuations of non-human species. Direct mentions of wildlife's intrinsic or environmental value were only expressed 113 times while direct mentions of the human-centered value of non-humans were expressed 165 times. Also, the 113 expressions of the former often utilized purely scientific or

legal phrasing which suggests that these expressions of biocentric and ecocentric perspectives had human-centric drivers (i.e. including these approaches to valuing non-humans to avoid facing consequences within human society, instead of including them primarily to genuinely reflect the characteristics of the approaches). Another way this misalignment with ESL is showcased is through the many instances of SARA speaking to a species' threats within human-centric frameworks, where underlying priorities are to maintain the superiority complex of humans and ensure minimal disruption to human systems. SARA often does this by only mitigating a threat according to what is deemed feasible within the context of unwavering aspects of human societies, rather than according to what will bring about the best outcomes for humans and non-humans equally with consideration for non-humans' value aside from humans. In all respects, this presents SARA as a law that only supports biocentric and ecocentric perspectives in a more wishful sense rather than displaying it consistently through all its legal plans and actions. As a result, SARA's outcomes will fail to benefit ecosystems and non-human species at the scale necessary to address the biodiversity crisis.

Overall, applying an ESL perspective towards SARA revealed the limited ways in which SARA exhibits biocentric and ecocentric perspectives. This not only misaligns with ESL but also contradicts SARA's own foundation that is deeply associated with the notion that non-humans are inherently and environmentally valuable and should not be considered lesser to humans. To properly achieve what it sets out to do, it is recommended that BPLs better incorporate biocentric and ecocentric perspectives, namely into the underlying philosophies of all decision makers and government actors relevant to their development and application. This way, a thorough and strategic restructuring of BPLs can occur including the conceptualizing, writing,

interpreting, executing and evaluating of the laws themselves and every instrument (regardless of the precise people involved, the species in question or any other context). From this, the perspectives should be well-incorporated into a BPL's overarching scope, definitions and metrics for success, as well as the formation and application of the law's principal aspects. For SARA, this includes the listing process, recovery strategies, action plans, management plans, monitoring and reporting on recovery progress, enforcement of prohibitions and protections, and the consideration or execution of any permits or emergency orders. Any incorporation of biocentric and ecocentric perspectives would likely include: the intrinsic value of all living beings and ecosystems, systems thinking for ecosystems (considering ecosystem-level processes, resilience and interdependence involving every species and individual being), long-term vs. short term management, landscape-scale conservation combined with individual-scale admiration and protection, and coexistence between humans and nature that embodies environmental justice and equity. Examples of their incorporation into SARA specifically include greater emphasis of a species' intrinsic value throughout its recovery strategy and action plan, expansion of scope for critical habitat and opportunities for emergency orders at the ecosystem scale.

6 Conclusion

Per the Discussion section, SARA exhibited numerous ESL characteristics – specifically the meaningful inclusion of present-day beings and Earth's future, recognition of unknowns in a complex world and consideration for adaptation and precaution as responses to complexity – in full or partial accordance with an ESL perspective in select instances. However, SARA largely worked against ESL – especially the meaningful inclusion of future humans and geographic areas, complete acceptance of both Earth system complexity and interdependencies and consistent commitment to adaptation in response to complexity. Ultimately, SARA offers little alignment with ESL today and could take various measures to enhance this alignment, particularly with regards to the ESL principles of complexity and interdependency. As well, SARA offers minimal expression of biocentric and ecocentric perspectives and generally upholds a human-centric perspective that contradicts ESL and Canada's own framework for SARA. Altogether, this outlines how SARA is currently built per more traditional schemes of environmental law (generally lacking a holistic, systems-thinking approach) and is therefore inadequate for the Anthropocene according to an ESL perspective. With this, SARA and biodiversity protection laws in general require full integration of a more transformative lens to bring about sustainable outcomes that benefit the entire Earth system through time.

With the Discussion section answering Research Questions 2 and 4, this section will be used to answer the remaining, more high-level questions for this study, effectively summarizing the study and its most notable contributions. This includes the following research questions to be answered in the same order:

1. How can an ESL perspective be applied to legal text, a key element of today's legal systems?

    a. Can a legal assessment tool be built that uses ESL as a conceptual foundation to evaluate biodiversity protection law in Canada?

3. Can ESL be considered practical for or effective at critically assessing biodiversity protection law?

4. How does this study contribute to the overall development and application of ESL as a conceptual framework?

5. What insights does this study offer regarding Canada's decentralized structure for governing land and natural resources?

Some major contributions of this study are the thorough summation of foundational ESL literature and the resulting conceptual framework (Figure 1) that encapsulates ESL in simple form. Both these contributions led to another: the development of a legal assessment tool. This tool, in the form of organized qualitative codes, incorporates both major (ESL's three foundational elements) and minor (various specific ways in which each foundational element can be experienced in the earth system) aspects of ESL. Further, the tool is capable of being used to evaluate legal text against specific interpretations of select topics that collectively represent an ESL perspective. The tool built for this study is not the only way to apply an ESL perspective or evaluate legal text using an ESL perspective, other methods could be developed and the tool used here could be improved upon (in general and for different contexts).

Ultimately, this study shows that such a tool can be built in general and in a particular way for a particular purpose, and other researchers are encouraged to further explore tools for applying ESL. Notably, there is currently no way for the study's author to irrefutably determine if the study successfully applied an ESL perspective at all or in the most complete sense. However, this is not deemed problematic as the scope centered around exploring ESL's application with the understanding that it remains a young concept in need of further research. In general, there are limitations associated with content analysis in that interpretations are necessary but difficult to perform with objectivity, restricting one's ability to label results as accurate with absolute certainty. Still, this study's interpretation and application of an ESL perspective (as well as the results from its application) have a degree of accuracy deemed satisfactory based on the following: the review of ESL literature that included ESL thought leaders directly involved in the ESL task force (part of the Earth System Governance Project that led to ESL's establishment), the study's methodological rigor, the pilot testing of codes prior to the official analysis, multiple reviews of coded data to validate interpretations while intentionally minimizing subjectivity as much as possible, and the acknowledgment of relevant biases and limitations throughout the research process.

Critically assessing biodiversity protection law is imperative to identifying and addressing shortfalls and improving a law's capability of fostering sustainable outcomes for non-human species. This study found that ESL can be effective at performing this critical assessment by producing specific critiques of a law's frameworks, processes and underlying perspectives of both the subject at hand and the world altogether that ultimately influence the law's outcomes. Through these critiques outlined by ESL, legal shortfalls are identified and

made possible to address, although the prescriptions relate to abstract, deeply-embedded items rather than shortfalls fixed by simply paying greater attention to the drafting of key instruments. With this, the practicality of using ESL to critically assess laws depends on the ability to overcome difficulties with implementing radical change in general or implementing incremental change when such foundational aspects are critiqued. Also, using ESL for this purpose requires full comprehension and even embracing of ESL's principles and characteristics and its overall transformative nature. This may not be easy or straightforward for any given person. The study involved an application of ESL that genuinely reflected its transformative nature, though it remains to be seen if addressing its critiques is considered practical today.

This study contributed to ESL's conceptual development and its ability to be productively applied. Specifically, this study provided a succinct summary of notable ESL literature and articulated (in plain language) both a visual framework and a list of specific concepts (provided as qualitative codes) that individually and collectively characterize ESL, including (at least partially) what its real-world application theoretically looks like. The study also showcased both a process capable of applying ESL to evaluate legal documents (elevating ESL from something theoretical to something that can be integrated into the real world) and the results from said process (practical descriptions of how legal text aligns with vs. contradicts ESL and how it could improve its alignment to foster more sustainable outcomes). Taken together, these are considered contributions to ESL's development and application that support establishing a clearer understanding of ESL as well as legitimately using ESL to enact the transformation that it embodies. With this, the next steps for ESL's development and application should involve establishing a more comprehensive understanding of ESL (in other

words, filling the remaining gaps in ESL's conceptual development), although it is not apparent how one will determine when ESL has been understood enough or if producing a definitive understanding of ESL in its entirety is even possible. However, there is a certain degree of conceptual development that must be complete to utilize any given thing for a specific purpose, so if ESL is to be used to transform legal systems, we need to both ensure the concept is developed enough for such transformations to occur productively and conduct research to validate progress for this milestone. It is understood at this time that ESL requires more development to be used to transform legal systems but has seemingly experienced enough development to be used to evaluate current legal systems (which is integral to eventually transforming them). This study showcases this, revealing that ESL's development to-date renders the concept determinative enough to outline the extents to which a given line of text (and ultimately entire documents and laws) aligns or misaligns with ESL principles and characteristics, and that efforts to use ESL this way are rather manageable. Future ESL research should verify these findings and advance ESL's use as an evaluator of current legal systems by assessing this study and making additional or different attempts to use ESL to critically assess legal text. This study is a master's thesis involving a considerable degree of interpretations by the author to explore the application of ESL in a specific context. While the limitations from these circumstances were adequately addressed to produce defensible and meaningful results, there are three recommendations provided here for future research to progress things further. First, one should utilize more time and resources than that devoted to a master's thesis. Second, one should provide well-supported interpretations but also pursue a degree of definitive truths free from interpretation (regarding ESL as a concept, its application and legal

systems as the subject of transformation) to enhance credibility. Finally, one should study different contexts for ESL's application including different methods and different subjects for those methods, such as laws outside of Canada and laws focused on different topics. It is also crucial that researchers thoroughly uncover the drivers of specific misalignments between legal systems and ESL and the obstacles vs. pathways associated with logistically transforming legal systems through ESL so that we not only know what to do but precisely how to do it. Above all else, future ESL research should maintain the urgent goal of realizing transformations that foster more sustainable outcomes for all parties in the Earth system.

Regarding Canada's decentralized structure for governing land and natural resources (and thus biodiversity, species' habitats and wildlife conservation), this study outlined clear limitations. Specifically, Canada's ability to both align its primary wildlife conservation strategy with ESL and foster more sustainable outcomes for biodiversity within its own borders were directly limited by this decentralized structure. To elaborate, applying an ESL perspective towards SARA outlined the severe extent to which legal plans and actions for wildlife conservation are characterized by which human groups have control (according to human systems, not the Earth system) over a particular geographic area that a species may visit or reside in. Through this, there are different groups potentially offering distinct (perhaps contradictory or insufficient) rather than similar or equally effective forms of support for wildlife. Also, outcomes for wildlife are ultimately limited by the different capabilities, priorities and biases across multiple man-made jurisdictions instead of being solely dictated by the congruent plans and actions most capable of supporting wildlife and the Earth system altogether (regardless of man-made borders). In other words, SARA operates within Canada's

decentralized structure by generally prioritizing the complexities of human systems (to do with land ownership among other aspects) over those of natural systems and the entire Earth system. This maintains a human-centric perspective that aims to solve issues like the biodiversity crisis in a disjointed manner according to the distinct preferences of various human groups. Ultimately, this opposes a unified approach that allows for the entire nation to develop and execute harmonious legal plans and actions that are genuinely capable of fostering sustainable outcomes for wildlife and the Earth system as a whole without having their efforts stalled or reversed by their own people. With this, it is understood that Canada taking a more centralized approach to governing its land and natural resources would enhance a biodiversity protection law's ability to present a more united and effective approach to conserving wildlife across the entire country. In particular, it would likely mean incorporating ESL principles and characteristics with greater ease or to a greater degree without the need to maintain a human-centric perspective to prioritize the distinct preferences of the humans in every man-made jurisdiction in Canada. With a more centralized approach, Canada could still prioritize humans over others and fail to adopt an ESL perspective, so it is key for this approach to adopt an ESL perspective on behalf of the nation (which is still easier to do with a centralized approach compared to attempting to get numerous different jurisdictions with different contexts to each adopt an ESL perspective), aligning its objective with the well-being of all Earth system participants through time instead of only humans within Canadian borders. It is not yet known what this more centralized approach would entail exactly and a detailed description is beyond the scope of this study, but it is referenced here in the general sense as an approach that is

inherently more capable of prioritizing the overarching objective of protecting wildlife over all other aspects.

In accordance with ESL literature and an ESL perspective, our legal systems today do not address the world we inhabit as marked by the Anthropocene and are therefore unable to produce outcomes capable of resolving urgent global sustainability issues like the biodiversity crisis. ESL seemingly offers a solution by reimagining legal systems through the incorporation of inclusivity, complexity and interdependency per an earth-system perspective, ultimately transforming them into systems capable of producing alternative outcomes. While the majority of ESL literature to date has been abstract, this study ventures into new territory by exploring ESL's application as a practical legal tool as a key initial step towards transforming legal systems through ESL. In summary, this study provided numerous key contributions including:

- further development, as well as a visual summation, of ESL's conceptual framework,
- a well-described approach to applying ESL by manufacturing and utilizing a legal assessment tool that incorporates numerous major and minor aspects of an ESL perspective,
- a showcase of the practicality and efficacy of applying ESL by using the described tool to evaluate Canada's Species at Risk Act (SARA),
- the implications of ESL on the biodiversity crisis and biodiversity protection law, offered by illustrating the specific ways and extents that SARA aligns and misaligns with ESL,
- confirmation that SARA generally misaligns with ESL while maintaining a human-centric perspective,
- a list of recommendations to better align biodiversity protection laws with ESL, and

- insights regarding the role that Canada's decentralized approach to governing land and natural resources plays in the critique of SARA from an ESL perspective.

These contributions have implications for researchers in the overlapping and distinct realms of ESL, law and wildlife conservation, as well as for those employed in a role pertaining to the development, analysis, implementation and evaluation of policies and laws (especially those relevant to biodiversity protection) in Canada and in general. With the active worsening of the biodiversity crisis among other global sustainability issues, there is an urgent need to further research ESL including the objectives, methods, efficacy and limitations of its application (with respect to the biodiversity crisis and in general) to fully enable any effective integration of ESL across legal systems. There is also a need to address the critiques of biodiversity protection law offered by this study through an applied ESL perspective to directly enhance laws and their outcomes (and thus the well-being of non-human species that visit or reside in Canada). Finally, similar critical assessments should be applied to other legal text (for biodiversity protection purposes and otherwise) in similar and different jurisdictions – even during the continued research of ESL's application, as transforming legal systems cannot not be delayed any further. Through all these efforts, our legal systems can fully incorporate ESL's transformative framework and become more equipped for the Anthropocene, fostering outcomes genuinely capable of supporting the entire Earth system through time in part by resolving sustainability issues including the biodiversity crisis.

References

Ahlstrom, H., Hileman, J., Wang-Erlandsson, L., Garcia, M.M., Moore, M., Jones, K., Pranindita, A., Kuiper, J.J., Fetzer, I., Jaramillo, F. and Svedin, U. (2021). An Earth system law perspective on governing social-hydrological systems in the Anthropocene. *Earth System Governance, 10.* https://doi.org/10.1016/j.esg.2021.100120.

Albert, M.J. (2020). Capitalism and Earth System Governance: An Ecological Marxist Approach. *Global Environmental Politics, 20*(2), 37-56. https://doi.org/10.1162/glep_a_00546.

Assarroudi, A., Nabavi, F.H., Armat, M.R., Ebadi, A. and Vaismoradi, M. (2018). Directed

qualitative content analysis: the description and elaboration of its underpinning methods and data analysis process. *Journal of Research in Nursing, 23*(1), 42-55. https://doi.org/10.1177/1744987117741667.

Bengtsson, M. (2016). How to plan and perform a qualitative study using content analysis. *NursingPlus Open, 2*, 8-14. https://doi.org/10.1016/j.npls.2016.01.001.

Biermann, F. (2007). 'Earth system governance' as a crosscutting theme of global change research. *Global Environmental Change, 17*(3-4), 326-337. https://doi.org/10.1016/j.gloenvcha.2006.11.010.

Biermann, F. (2018). Earth System Governance – Beyond Traditional Environmental Policy. *GAIA – Ecological Perspectives for Science and Society, 27*(4), 337.

Biodivcanada. (n.d.). *2020 Biodiversity Goals and Targets for Canada.* Accessed at https://www.biodivcanada.ca/national-biodiversity-strategy-and-action-plan/2020-biodiversity-goals-and-targets-for-canada.

Bolliger, C.S., Raymond, C.V., Schuster, R and Bennett, J.R. (2020). Spatial coverage of protection for terrestrial species under the Canadian Species at Risk Act. *Ecoscience, 27*(2), 141-147. https://doi.org/10.1080/11956860.2020.1741497.

CHM of the CBD, The. (2018). *Canada's 6th National Report for the Convention on Biological Diversity.* Retrieved from https://chm.cbd.int/pdf/documents/nationalReport6/241248/8.

Cairoli, S. (2018). *Differences Between Ecocentric & Biocentric.* Accessed at https://sciencing.com/what-are-main-limitations-of-behavioral-theories-12748816.html.

Creighton, M.JA. and Bennett, J.R. (2019). Taxonomic biases persist from listing to management for Canadian species at risk. *Ecoscience, 26*(4), 315-321. https://doi.org/10.1080/11956860.2019.1613752.

Creswell, J.W. and Creswell, J.D. (5th Ed.) (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches.* SAGE Publications, Inc.

Di Marco, M., Boitani, L., Mallon, D., Hoffmann, M., Iacucci, A., Meijaard, E., Visconti, P., Schipper, J. and Rondinini, C. (2014). A Retrospective Evaluation of the Global Decline of Carnivores and Ungulates. *Conservation Biology, 28*(4), 1109-1118. https://doi.org/10.1111/cobi.12249.

Dirzo, R., Young, H.S., Galetti, M., Ceballos, G., Isaac, N.J.B. and Collen, B. (2014). Defaunation in the Anthropocene. *Science, 345*(6195), 401-406. https://doi.org/10.1126/science.1251817.

Ecojustice. (2012). *Failure to Protect: Grading Canada's Species at Risk Laws.* Retrieved from https://ecojustice.ca/wp-content/uploads/2014/08/Failure-to-protect_Grading-Canadas-Species-at-Risk-Laws.pdf.

ESG. (2022). *Taskforce on Earth System Law.* Accessed at https://www.earthsystemgovernance.org/research/taskforce-on-earth-system-laws/.

Favaro, B., Claar, D.C., Fox, C.H., Freshwater, C., Holden, J.J. and Roberts, A. (2014). Trends in Extinction Risk for Imperiled Species in Canada. *PLOS One, 9*(11). https://doi.org/10.1371/journal.pone.0113118.

Gellers, J.C. (2021). Earth system law and the legal status of non-humans in the Anthropocene. *Earth System Governance, 7.* https://doi.org/10.1016/j.esg.2020.100083.

Government of Canada. (2002). Species At Risk Act (S.C. 2002, c. 29). Accessed at https://laws-lois.justice.gc.ca/eng/acts/S-15.3/page-1.html.

Government of Canada. (2016). *About the Species at Risk Act.* Accessed at https://www.canada.ca/en/environment-climate-change/services/environmental-enforcement/acts-regulations/about-species-at-risk-act.html.

Government of Canada. (2017). *Acts administered by Environment and Climate Change Canada: Biodiversity and conservation.* Accessed at https://www.canada.ca/en/environment-climate-change/corporate/transparency/acts-regulations/acts-administered.html.

Government of Canada. (2020). *Convention on Biological Diversity.* Accessed at https://www.canada.ca/en/environment-climate-change/corporate/international-affairs/partnerships-organizations/biological-diversity-convention.html.

Hsieh, H. and Shannon, S.E. (2005). Three Approaches to Qualitative Content Analysis. *Qualitative Health Research, 15*(9), 1277-1288. https://doi.org/10.1177/1049732305276687.

IPBES (2019): Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors). IPBES secretariat, Bonn, Germany. 1148 pages. https://doi.org/10.5281/zenodo.3831673

Kim, R.E. (2021). Taming Gaia 2.0: Earth system law in the ruptured Anthropocene. *The Anthropocene Review.* https://doi.org/10.1177/20530196211026721.

Kim, R.E. and Kotzé, L.J. 2021. Planetary boundaries at the intersection of Earth system law,

science and governance: A state-of-the-art review. *Review of European, Comparative and International Environmental Law, 30*, 3-15.

Kim, R.E., Blanchard, C. and Kotze, L.J. (2022). Law, systems, and Planet Earth: Editorial. *Earth System Governance, 11*. https://doi.org/10.1016/j.esg.2021.100127.

Koons, J.E. (2012). At the tipping point: defining an earth jurisprudence for social and ecological justice. *Loyola Law Review, 58*(2).

Kotze, L.J. and French, D. (2018). A critique of the Global Pact for the environment: a stillborn initiative or the foundation for *Lex Anthropocenae*? *International Environmental Agreements, 18,* 811-838. https://doi.org/10.1007/s10784-01-9417-x.

Kotze, L.J. (2019). Earth System Law for the Anthropocene. *Sustainability, 11*(23), 6796. https://doi.org/10.3390/su11236796.

Kotze, L.J. and Kim, R.E. (2019). Earth system law: The juridical dimensions of earth system governance. *Earth System Governance, 1*. https://doi.org/10.1016/j.esg.2019.100003.

Kotze, L.J. (2020). Earth system law for the Anthropocene: rethinking environmental law alongside the Earth system metaphor. *Transnational Legal Theory, 11*(1-2), 75 104. https://doi.org/10.1080/20414005.2020.1776556.

Kotze, L.J. and Kim, R.E. (2020). Planetary boundaries at the intersection of Earth system law, science and governance: A state-of-the-art review. *RECIEL, 30*(1), 3-15. https://doi.org/10.1111/reel.12383.

Kotze, L.J. and Kim, R.E. (2021). Exploring the Analytical, Normative and Transformative Dimensions of Earth System Law. *Environmental Policy and Law, 50*(6), 457-470. https://doi.org/10.3233/EPL-201055.

Kotze, L.J. and Kim, R.E. (2023). Earth System Law. In: Wallenhorst, N., Wulf, C (eds) Handbook of the Anthropocene. Springer, Cham. https://doi.org/10.1007/978-3-031-25910-4_91.

Lemkow, A. and VanderZwaag, D.L. (2014). Recovery Planning under Canada's Species at Risk Act in a Changing Ocean: Gauging the Tides, Charting Future Coordinates. *Journal of Environmental Law and Practice, 26*(2), 121-156.

Mai, L. and Boulot, E. (2021). Harnessing the transformative potential of Earth System Law: From theory to practice. *Earth System Governance, 7.* https://doi.org/10.1016/j.esg.2021.100103.

Mawdsley, J.R., O'Malley, R. and Ojima, D.S. (2009). A review of climate-change adaptation strategies for wildlife management and biodiversity conservation. *Conservation Biology, 23*(5), 1080-1089. https://doi.org/10.1111/j.1523-1739.2009.01264.x.

Mosquin, T. and Rowe, S. (2004). A Manifesto for Earth. *Biodiversity.* 5(1): 3-9.

Nitzbon, J., Heitzig, J. and Parlitz, U. (2017). Sustainability, collapse and oscillations in a simple World-Earth model. *Environmental Research Letters, 12.* https://doi.org/10.1088/1748-9326/aa7581.

Olive, A. (2012). Does Canada's Species at Risk Act Live Up to Article 8(J)? *The Canadian Journal of Native Studies, 32*(1), 173-189.

Olive, A. (2014). The road to recovery: Comparing Canada and US recovery strategies for shared endangered species. *The Canadian Geographer, 58*(3), 263-275. https://doi.org/10.1111/cag.12090.

Pelletier, F. and Coltman, D.W. (2018). Will human influences on evolutionary dynamics in the wild pervade the Anthropocene? *BMC Biology, 16*(7). https://doi.org/10.1186/s12915-017-0476-1.

Petersmann, M. (2021). Sympoietic thinking and Earth System Law: The Earth, its subjects and the law. *Earth System Governance, 9.* https://doi.org/10.1016/j.esg.2021.100114.

Pope, K., Bonatti, M. and Sieber, S. (2021). The what, who and how of socio-ecological justice: Tailoring a new justice model for earth system law. *Earth System Governance, 10.* https://doi.org/10.1016/j.esg.2021.100124.

Ray, J.C., Grimm, J and Oliva, A. (2021). The biodiversity crisis in Canada: failures and challenges of federal and sub-national strategic and legal frameworks. *FACETS, 6.* https://doi.org/10.1139/facets-2020-0075.

Roe, D., Dickman, A., Kock, R., Milner-Gulland, E.J., Rihoy, E. and Sas-Rolfes, M. (2020). Beyond banning wildlife trade: COVID-19, conservation and development. *World Development, 136.* https://doi.org/10.1016/j.worlddev.2020.105121.

Rottman, J. (2014). Breaking down biocentrism: two distinct forms of moral concern for nature. *Frontiers in Psychology, 5*. https://doi.org/10.3389/fpsyg.2014.00905.

Sol, J. (2018). Economics in the Anthropocene: Species Extinction or Steady State Economics. *SSRN Electronic Journal: Ecological Economics, 165*(106392). https://doi.org/10.2139/ssrn.3162576.

Stokes, D.L. (2018). Why conserving species in the wild still matters. *Biodiversity and Conservation, 27,* 1539-1544. https://doi.org/10.1007/s10531-018-1509-y.

Swerdfager, T. and Olive, A. (2023). Laws matter: a foundational approach to biodiversity conservation in Canada. *FACETS, 8.* https://doi.org/10.1139/facets-2022-0095.

Swerdfager, T. and VanNijnatten, D. (2024*). Canadian Environmental Policy and Politics.* 5th ed., Oxford University Press Canada, 2024.

Turcotte, A., Kermany, N., Foster, S., Proctor, C.A., Gilmour, S.M., Doria, M., Sebes, J., Whitton, J., Cooke, S.J. and Bennett, J.R. (2021). Fixing the Canadian Species at Risk Act: identifying major issues and recommendations for increasing accountability and efficiency. *FACETS, 6*, 1474-1494. https://doi.org/10.1139/facets-2020-0064.

Van Uhm, D.P. (2018). The social construction of the value of wildlife: A green cultural criminological perspective. *Theoretical Criminology, 22*(3), 384-401. https://doi.org/10.1177/1362480618787170.

Waples, R.S., Nammack, M., Cochrane, J.F. and Hutchings, J.A. (2013). A Tale of Two Acts: Endangered Species Listing Practices in Canada and the United States. *Bioscience, 63*(9), 723-734. https://doi.org/10.1525/bio.2013.63.9.8.

Wyatt, T. (2021). Canada and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES): Lessons Learned on Implementation and Compliance. *Liverpool Law Review, 42,* 143-159. https://doi.org/10.1007/s10991-020-09267-8.

Glossary

Biodiversity – all the different forms of living things in a geographic area.

Biodiversity Crisis – the phenomenon where biodiversity is experiencing substantial losses of life including entire species due to a variety of factors including multiple human drivers.

Biodiversity Protection Laws – legislation and related instruments that have as their primary goal the protection, preservation and enhancement of biodiversity.

Earth System Perspective – a worldview that centers around the idea that Earth is a singular, complex system made up of interconnected elements and processes.

Ecocentric and Biocentric Approaches – non-anthropocentric approaches to valuing non-human species that include valuing these species according to their contributions to ecosystems and according to their inherent value as living beings, respectively.

ESG – coined by Frank Biermann, it describes a novel framework for governance that could be accepted and used by natural and social scientists alike to better manage our planet.

ESL – under the umbrella of ESG, it describes a different way of imagining legal systems through the use of an earth system perspective so that legal systems are experienced differently in reality such that long-term sustainability is achievable across the planet.

ESL Perspective – Using the earth system perspective as a foundation, it encompasses all elements that describe ESL's particular way of imagining legal systems (led by ESL's three foundational elements: Complexity, Inclusivity and Interdependencies) and their justifications.

Legal Systems – the array of elements and processes associated with the development, implementation and enforcement of laws in a human society.

Appendix

Codebook

Complexity		
Code	**Description**	**Examples**
Adapting	Directly or indirectly acknowledging/referring to adaptability or resilience with respect to potential future circumstances that lack certainty/predictability, and/or the general increasing need for adaptability or resilience brought about by humans/the Anthropocene. Increased anticipation for the future/unforeseen outcomes.	1. The long-term objectives are to achieve a self-sustaining population of Blanding's Turtles in Nova Scotia, over the current range (as measured by 95% probability of persistence in each recognized population when projected over 10 generations (400 years)), and to maintain sufficient gene flow to prevent any single population from becoming genetically isolated. 2. These studies will enable land managers to prioritize management actions for rapid habitat recovery and to implement successful restoration practices through an adaptive management approach. 3. In a stable system such as that, hybridization can even benefit Eastern Wolves by increasing genetic diversity and thus the species' ability to respond to environmental change (such as climate change) (Hamilton and Miller 2015; Jackiw et al. 2015). 4. This approach allows for travel among high use areas, unidentified habitats within the population or habitats that are currently unused but may become used in future (e.g. new wetland habitat following creation of a beaver dam; new nesting areas created through disturbance).
Info Gaps	Directly or indirectly acknowledging/referring to gaps in knowledge based on a lack of understanding/data.	1. By providing national leadership to improve our understanding of this important species and how its local populations are affected by human activities, implementation of this federal Action Plan will provide information necessary for better decision-making, and better results for boreal caribou. 2. Benefits include opportunities to engage with and benefit from traditional knowledge of Indigenous Peoples, including the potential to fill knowledge gaps and enhance and strengthen relationships.

		3. This document is considered a partial action plan because current best available information is insufficient to identify critical habitat (DFO 2014). Identification of the habitat necessary to support survival and recovery of the species may be addressed in an amendment to the recovery strategy at a later date.
Info Reliability	Directly or indirectly acknowledging/referring to certainty/uncertainty according to the reliability of information already known or to be known.	1. Credible information is essential for making sound decisions that result in effective outcomes for species at risk, including boreal caribou. As such, the Government of Canada will lead the creation of a new National Boreal Caribou Knowledge Consortium to enable provinces and territories, Wildlife Management Boards, Indigenous peoples, and stakeholders to address key knowledge gaps, regularly share information and lessons learned, and to undertake studies to support boreal caribou recovery. 2. The near-term population target identified above is based on the best available science and will be reviewed based on the outcome of further research and monitoring. While it is recognized that the science around Monarch recovery is emerging and is incomplete in some areas, this target provides an initial basis for measuring progress and stimulating action. 3. Critical habitat is identified at all five known sites containing two or more identified individuals (three major populations and two smaller concentrations). Sites containing unconfirmed sightings are not included at this time. Sites containing only one identified turtle were excluded because it is possible that the turtles were moved there by the public. The two small concentrations were included in critical habitat identification at this time based on the precautionary principle; this will be reviewed as more information becomes known about these sites.
Human Systems	Directly or indirectly acknowledging/referring to the complexity existing within one or more human system (a	1. Dam construction is a threat of high concern in Ontario. All other threats, in both New Brunswick and Ontario, are either of low concern or the impact is unknown and include; dam construction, pollution, invasive

	systematic element of life within a human society such as economies, politics or education). Includes the inability to isolate factors/elements within a system that lead to certain outcomes. Includes limitations to implementing plans brought about by human/human system complexities (budget constraints, priorities of different parties, etc.). The intricate dynamics within human systems that can make conservation or day-to-day life complex.	species, residential development, forest harvesting and agriculture land use, wakes from boats, and vehicle traffic on roads. 2. Commercial collecting is likely not a significant threat given that Five-lined Skinks would not sell for a high price given their abundance in the United States. Incidental collecting for personal use may be more common. A cursory search on the internet revealed numerous mentions of people keeping them as pets (including one from Ontario), as well as pet care information forms and videos of Five-lined Skinks kept as pets (Seburn pers obs. 2011). 3. These socio-economic analyses are conducted in accordance with guidance established by the Treasury Board Secretariat and would include all incremental costs associated with an order, including any increased costs for different activity sectors, forgone economic opportunities, and potential impacts on small businesses and traditional uses.
Natural Systems	Directly or indirectly acknowledging/referring to the complexity existing within one or more natural system (a systematic element of the Earth, including its continuous processes such as the water cycle, that doesn't directly refer to living things) or the Earth's entire natural system (referring to Earth as one overarching, natural system) or one or more non-human system (non-human ecosystems at a general level or a specific, systematic element of life within a non-human society such as food chains). Includes the inability to isolate factors/elements within a system that lead to certain outcomes.	1. The majority of the adult life of the leatherback is spent in the marine environment. Foraging areas with high jellyfish biomass are critical for meeting the energy requirements of this endangered species. The coastal Pacific waters frequented by this species provide such foraging opportunities and are not only important to the survival of the individual, but also provide vital support for the recovery of the nesting populations. 2. Over the course of its life, Eastern Wolf uses various types of habitats. It is generally found in extensive forested areas (e.g., over 100 km2). Eastern Wolf populations are limited by prey availability, and higher densities are observed in areas with high prey abundance, particularly White-tailed Deer (Odocoileus virginianus), Moose (Alces alces) and Beaver (Castor canadensis). Hybridization of the Eastern Wolf with the Grey Wolf is also considered a limiting factor, as is the territoriality of large canid packs, which reduces the potential expansion of the Eastern Wolf population beyond already occupied sites.

		3. The invasive species described below have the potential to impact the Pygmy Snaketail directly with the larval nymphs becoming prey for new predators. Invasive aquatic plant species can result in the alteration of habitat characteristics, making a site unsuitable (COSEWIC 2008). The impact of introduced, invasive species on Pygmy Snaketail in New Brunswick and Ontario is unknown at the present time.
No Adapting - Typical & Predictable	Directly or indirectly acknowledging/referring to the presence of certainty/predictability (no presumed need for adaptability or resilience) with regards to future circumstances. Includes statements that things are or can be predictable. Includes failing to acknowledge the uncertainty of the future or of natural systems and their species. Includes acting as though species can be protected using well-known practices alone or by focusing only on the known habitats/locations/entities. Includes suggestions that complex things can be controlled/perfectly understood.	1. Climate change impacts may become more significant in the future, but, over the next 18 years (3 generations), the impact is predicted to remain low. 2. Predictions for Sable Island are for a continued 1 cm/year increase in sea level as a result of climate change (Manson et al. 2019). It is anticipated that Sable Island will continue to build upward with the regional rise in sea level, building new dunes as long as the regional oceanic patterns are not greatly altered and as long as there is an abundant supply of sand available for this regional system (Duck et al. 2014). 3. The objective of this management plan is to maintain the distribution and number of viable element occurrences of Five-lined Skink – Great Lakes/St. Lawrence population. The focus has been placed on the number of viable element occurrences because these local populations are known to contain adequate numbers of Five-lined Skink to ensure persistence for at least 20 years and, as such, represent a greater conservation value for the species.
Nonlinearity	Directly or indirectly acknowledging/referring to nonlinearity regarding the planet as a whole, human systems, natural systems or any combination of these elements	1. As a small, isolated population complex, Nova Scotia Blanding‟s turtles are vulnerable to stochastic (chance) events (COSEWIC 2005). Local disturbances such as unusually high predation, extreme weather, or disease, which would have little effect on a large population, could be devastating. The species‟ tendency to densely aggregate at

	Accepting that uncertainty and/or continual large-scale changes is/are now an inherent characteristic of Earth.	seasonal locations, such as nesting and overwintering sites exacerbates this risk. 2. Population and habitat conditions for boreal caribou will change over time given the changes to population demographics, the dynamic nature of the boreal ecosystem and the manner in which the species shifts in its use of the landscape over time. 3. Historically, when a forest fire occurred, boreal caribou would shift their use of habitat from the burned areas to areas that are more suitable. However, with the increase of industrial exploration and development, in a number of ranges there are fewer available suitable areas into which boreal caribou can move. When combined with human-caused disturbance, forest fires can threaten boreal caribou recovery even though they are a natural component of the boreal forest ecosystem. In some areas, forest fires have been reported as occurring more frequently than in the past (Whitefeather Forest, 2006; Boreal Caribou ATK Reports, 2010-2011).
Precautionary	Directly or indirectly acknowledging/referring to the need to be precautionary due to the unforeseen consequences that may result within or across complex systems.	1. Until more detailed information is available as a baseline, a precautionary approach is important to maintain the species' presence in known occupied sites. 2. Increased understanding of the genetic status of Banff Springs Snail will aid potential active management in the event of local extirpations caused by drying events. 3. Given the knowledge gaps on Eastern Wolf population and distribution, which are due in part to uncertainties regarding the extent of hybridization with other species and hybrids of the genus Canis and to a lack of data, further studies will be required to resolve the taxonomic uncertainties and to manage the technical challenges associated with the need to identify the species by molecular analysis. Given these uncertainties, it is likely that some conservation and management measures will need to be broadly applied to all large canids found within the Eastern Wolf range, at least temporarily.
Tipping Points	Directly or indirectly acknowledging/referring to	1. The presence of private fish and game clubs is also part of the human history of this

	tipping points, a phenomenon that suggests that select circumstances can bring about an irreversible destabilization within/across a complex system (Earth, ecosystems, human societies, etc.).	territory. These clubs played a major role in wildlife protection by preventing overuse of the resource but they also contributed to the introduction of several species of fish into the lakes and permanently changed the aquatic ecosystems. 2. For large continuous ranges, a different approach for assessing cumulative effects will be required than for smaller discrete ranges. Dividing the large areas into smaller management units will allow land managers to understand where the disturbance is occurring and avoid irreversible range retraction and a permanent break in range connectivity. 3. Destruction of critical habitat would result if part of the critical habitat were degraded, either permanently or temporarily, such that it would not serve its function when needed by the species. Destruction may result from a single or multiple activities at one point in time or from the cumulative effects of one or more activities over time.
No Complexity	Directly or indirectly acknowledging/referring to simplicity existing within human or natural systems.	No clear examples were established.
Inclusivity		
Code	**Description**	**Examples**
Greater Timescales	Directly or indirectly acknowledging/referring to timescales that stretch beyond 1 democratic government cycle (4 years) or human generation (20-30 years) or human lifetime (80-100 years).	1. Ranges that are highly disturbed will take decades to recover from habitat alteration, as boreal caribou occur in mature boreal forest ecosystems that have evolved over centuries. 2. The precise effect that climate change will have on the Oyamel Fir forests is unknown, but modelling suggests that the currently known overwintering sites are likely to become significantly less suitable for the Monarch over the next 50 years due to increased cool-weather precipitation which could result in increased mortality

		(Oberhauser and Townsend, 2003). Based on climatic models, Sáenz-Romero and Lindig-Cisneros (2012) predicted that the climate suitable for Sacred (Oyamel) Firs will ascend in altitude with climate change, resulting in no suitable habitat within the Monarch Butterfly Biosphere Reserve by 2090. The impacts of pests and disease are expected to increase over the same time period due to increased temperature and drought stress brought on by climate change (Ramirez et al., 2015). 3. The effects of dams on the aquatic environment may be dramatic and long term, potentially affecting long stretches of the watercourse both upstream and downstream of the dam location and altering hydrological patterns.
Future Humans	Directly or indirectly acknowledging/referring to future generations of humans as a unified whole and/or in a manner that supports equality amongst humans while considering different vulnerabilities and contexts. Includes distancing from short-termism and/or referring to timescales greater than 1 democratic government cycle (4 years) or human generation (20-30 years) or human lifetime (80-100 years).	1. Non-use values include bequest value (satisfaction of knowing that future generations will have access to nature's benefits), altruist value (satisfaction of knowing that other people have access to nature's benefits) and existence value (satisfaction of knowing that a species or ecosystem exists). 2. Canada's national parks protect a country-wide system of representative natural areas of Canadian significance. Parks Canada is responsible for managing these special places for the benefit, education and enjoyment of Canadians, while ensuring that they are protected and maintained so that they are left unimpaired for future generations.
Future Non-Humans	Directly or indirectly acknowledging/referring to future generations of non-human species as a unified whole and/or in a manner that supports equality between humans and	1. Severity – Within the scope, the level of damage to the species from the threat that can reasonably be expected to be affected by the threat within a 10-year or 3-generation timeframe. Usually measured as the degree of reduction of the species' population. (Extreme = 71–100%; Serious = 31–70%; Moderate = 11–30%; Slight = 1–10%;

	non-human species while considering different vulnerabilities and contexts. Includes distancing from short-termism and/or referring to timescales greater than 1 democratic government cycle (4 years) or species-specific generation.	Negligible < 1%; Neutral or Potential Benefit ≥ 0%). 2. Notwithstanding this uncertainty, the targets and objectives identified within this document are intended to ensure adequate population resilience and maintain >80% probability of persistence of the Black-tailed Prairie Dog in Canada over 50 years. 3. One example is: The misuse of pesticides or any other activity that reduces prey abundance to the point where Swift Fox populations decline in the long-term or are extirpated from the area.
Geographic Areas	Directly or indirectly acknowledging/referring to jurisdictions/geographic areas outside of Canada.	1. The Monarch is an insect for which the remarkable lifecycle and migration of certain populations has attracted the attention of people worldwide. In North America, the Monarch is a symbol of international cooperation, conservation and appreciation of nature. 2. Broad strategy 4: support the efforts of other countries to promote the recovery of the Leatherback Sea Turtle population(s) that frequent Canadian Pacific waters. Approach 4-1: explore opportunities to participate in International efforts for the protection and recovery of the Leatherback Sea Turtle. Approach 4-2: initiate agreements and collaborative projects with countries that share populations of Leatherback Sea Turtles that frequent Canadian Pacific waters. 3. Genetically distinct Pacific and Atlantic stocks of leatherbacks make extensive feeding migrations to Canadian coastal waters from nesting beaches and rearing areas in tropical seas. The species' occurrence in Canadian waters and its increasing global rarity demand aggressive conservation measures that involve not only actions in Canada but also the participation of Canadians in international programs and projects. This Recovery Strategy for the Leatherback Turtle in Pacific Canadian Waters complements one developed for leatherback turtles in Atlantic Canadian waters.

Normative Inclusivity	Directly or indirectly acknowledging/referring to present-day humans (as individuals or as a collective) that represent governments -- those already expected to be included because of the power associated with their status. Also includes evident references to short-term timescales of 1 democratic government cycle (4 years) or human generation (20-30 years) or human lifetime (80-100 years).	1. With regard to the portions of critical habitat on non-federal lands, Environment and Climate Change Canada will assess the protection currently in place. This involves first working with the Government of Nova Scotia to determine which Nova Scotia laws and legal instruments are in place to prevent destruction of critical habitat. If there are gaps in the protection of critical habitat, provisions or measures in place under SARA or other federal legislation will be reviewed to determine whether they prevent destruction of critical habitat. 2. The federal, provincial, and territorial government signatories under the Accord for the Protection of Species at Risk (1996) agreed to establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada. Under the Species at Risk Act (S.C. 2002, c.29) (SARA), the federal competent ministers are responsible for the preparation of action plans for species listed as extirpated, endangered, or threatened for which recovery has been deemed feasible. They are also required to report on progress five years after the publication of the final document on the Species at Risk Public Registry. 3. Ensure suitable habitat is available for prairie dogs to re-establish on previously occupied colonies over the next 5 years.
Potential	Mentioning the potential opportunity for greater inclusivity, without specifying who. Includes statements that allude to including non-human species or non-normative groups of humans but don't mention anyone in particular as well as statements that discuss a potential to improve inclusivity in general.	1. Through the establishment of SARA conservation agreements with other governments on non-federal lands and a national forum for dialogue between partners to share lessons learned and review all sources of knowledge, this Action Plan will enable the collaboration needed to help secure the species for the benefit of future generations. 2. Encourage the creation of butterfly gardens using milkweed species native to the area and the re-naturalization of degraded/unsuitable habitat.

Present-Day Humans	Directly or indirectly acknowledging/referring to present-day humans as a unified whole and/or in a manner that supports/addresses the well-being of non-government-related humans.	1. At the initiation of the Leatherback Sea Turtle action planning process, letters were sent to all coastal Indigenous Groups, inviting their participation in the development of the action plan. 2. Collaboration with adjacent land managers and owners will be important to conserving cross-boundary species at risk. 3. As stated in the preamble to SARA, success in the recovery of this species depends on the commitment and cooperation of many different constituencies that will be involved in implementing the directions and actions set out in this action plan and will not be achieved by Fisheries and Oceans Canada and the Parks Canada Agency or any other jurisdiction alone. The cost of conserving species at risk is shared amongst different constituencies. All Canadians are invited to join in supporting and implementing this action plan for the benefit of Leatherback Sea Turtle and Canadian society as a whole.
Present-Day Non-Humans	Directly or indirectly acknowledging/referring to present-day non-human species as a unified whole and/or in a manner that supports/addresses the well-being of non-human species.	1. The Act recognizes that “wildlife, in all its forms, has value in and of itself and is valued by Canadians for aesthetic, cultural, spiritual, recreational, educational, historical, economic, medical, ecological and scientific reasons” (SARA 2002). 2. The management objective for the Pygmy Snaketail is to maintain the presence of existing populations at all sites where they are currently known to occur and conserve new occurrences that are identified. This will be achieved by implementing conservation measures that are organized under the following three broad strategies: 1. Population monitoring and surveys of suitable habitat 2. Maintenance of aquatic habitat quality and quantity 3. Outreach, education, and stewardship to promote conservation. 3. Reason for Designation: Almost the entire range of the calling population is within Canada. The toads are particularly sensitive to emerging skin disease caused by the amphibian chytrid fungus, which has been linked to global amphibian declines. This species is relatively intolerant of urban

		expansion, conversion of habitat for agricultural use, and habitat fragmentation resulting from resource extraction and road networks. Life history characteristics, including infrequent breeding by females, aggregation at communal, traditionally used breeding sites, and migrations to and from breeding sites, make populations vulnerable to habitat degradation and fragmentation. The species remains widespread throughout much of their historic range in Alberta and may be expanding their range eastwards. However, declines are suspected and projected based on known vulnerabilities and threats.
Missed Opportunity	Failing to acknowledge/refer to inclusivity in a statement that would have obviously benefitted from its acknowledgment.	No clear examples were established.
Interdependencies		
Code	**Description**	**Examples**
Geographic Areas	Directly or indirectly acknowledging/referring to the relationships and/or survival or well-being needs between jurisdictions on Earth or a jurisdiction and Earth itself that outlines or suggests dependence.	1. As agreed to with the United States and Mexico, the long-term goal is to ensure the conservation of the Monarch butterfly migratory phenomenon. In the near-term, and to substantially lower the risk of extinction of the Eastern Monarch population, the three countries will work towards a target of six hectares of occupied overwintering habitat in Mexico by 2020. The available information is not sufficient to set a

		quantitative population target for the Western migratory Monarch population. The three countries have agreed to work towards identifying a target for the Western migratory Monarch population. 2. Most of the individuals found in British Columbia overwinter in California, and most of the individuals from east of the Rocky Mountains in Canada overwinter in Central Mexico. Nonetheless, recent findings indicate that there is mixing of the two populations and that the Western population may be reinforced by individuals from the Eastern population (Lyons et al., 2012). 3. Sylvatic plague has been a threat to Black-tailed Prairie Dogs across their range since the mid-20th century (Cully and Williams 2001, Antolin et al. 2002). The pathogen responsible for the disease, the bacterium Yersinia pestis, was introduced from Asia to North America in the early 1900s, and today is found from Texas to southern Canada (Richgels et al. 2016).
Humans vs. Earth	Directly or indirectly acknowledging/referring to the relationships and/or survival or well-being needs between humans and Earth, including its elements, landscapes and natural ecosystems, that outlines or suggests dependence. Includes recognition of a responsibility or obligation to maintain or strengthen the well-being of both parties.	1. Recovery planning is intended to benefit species at risk and biodiversity in general. However, it is recognized that implementation of action plans may also inadvertently lead to environmental effects beyond the intended benefits. The planning process based on national guidelines directly incorporates consideration of all environmental effects, with a particular focus on possible impacts upon non-target species or habitats. 2. Self-sustaining and healthy ecosystems with their various elements in place, including species at risk, contribute positively to the livelihoods and the quality of life of all Canadians. 3. These measures are expected to have an overall positive impact on ecological integrity and enhance opportunities for appreciation of the site and the species by visitors and the general public. This action plan includes measures that could result in benefits to Canadians, such as positive impacts on biodiversity and the value individuals place on preserving biodiversity (Federal,

		Provincial, Territorial Governments of Canada, 2014).
Humans vs. Non-Humans	Directly or indirectly acknowledging/referring to the relationships and/or survival or well-being needs between humans and non-human species that outlines or suggests dependence. Includes recognition of a responsibility or obligation to maintain or strengthen the well-being of both parties.	1. Conduct population management (e.g., captive breeding, conservation translocation, supplemental feeding), should monitoring and research determine that these measures are necessary and effective for species survival and recovery. 2. Threats to the skink include loss and degradation of habitat, alteration of microhabitat, illegal collection, increased depredation by cats and dogs and increased mortality on roads. Increasing development in the species' range will make populations more isolated and more susceptible to stochastic events on small sites. 3. Since Black-tailed Prairie Dogs consume and clip many of the same species of grasses and forbs that are consumed by livestock (Detling 2006), the species has been historically regarded as a competitor with ranching operations and a threat to the livelihood of ranchers. In addition to financial concerns, Black-tailed Prairie Dogs are generally perceived as a symbol of poor land stewardship, aggravated by the fear that the government may impose restrictions or take control of private and public land to manage the species (Detling 2006, Lamb et al. 2006).
Present vs. Future	Directly or indirectly acknowledging/referring to the relationships and/or survival or well-being needs between the Earth and any of its beings in the	1. Those activities may also change nutrient availability, encouraging future succession of non-native plant species, which may also influence the prey base. 2. Through the establishment of SARA

	present versus future time periods that outlines or suggests dependence. Includes recognition of a responsibility or obligation to maintain or strengthen the well-being of both parties.	conservation agreements with other governments on non-federal lands and a national forum for dialogue between partners to share lessons learned and review all sources of knowledge, this Action Plan will enable the collaboration needed to help secure the species for the benefit of future generations. 3. Increased frequency and severity of storms, in addition to climate change and related sea level rise, are expected to drive change which will further decrease the quality and quantity of bee habitat on the island. Eco-tourism is also a potential future threat, which may also increase the introduction and spread of invasive species.
No Interdependencies	Directly or indirectly acknowledging/referring to a lack of interdependence between humans and the Earth or humans and non-human species.	No clear examples were established.

Themes From Coded Data

Complexity		
Parent Code	**Subcode or Pattern/Theme**	**Contribution Percentage (%)**
Adapting	Adaptive Mgmt.	5
	Climate Change Adaptation	5
	Emergency & Mgmt. Planning	14
	Habitat Resiliency	1
	Human Resilience to Wildlife	5
	General Poor Wildlife/Habitat Resilience	8
	Wildlife Reliance on Humans	2

	Responding to Outcomes/Evaluations/New Info.	44
	Self-sustaining Ecosystems	1
	Action Despite Uncertainty	9
	Wildlife Adaptation: Resilience, Persistence & Self-Sustainability	61
	Win-Win Scenarios: Adapting to Live With Nature	4
Info Gaps	Benefits & Costs	3
	Climate Change	4
	Ecosystem Characteristics	4
	Filling Gaps via Indigenous Knowledge	6
	General Need to Fill Gaps	8
	Humans & Their Attitudes	2
	Incomplete Habitat Identification	22
	Response or Recovery Strategies; Current Protection Status	29
	Species Info.	81
	Tackling Peoples' Lack of Knowledge	17
	Accepting Limitations in Knowledge Acquisition	3
Info Reliability	Best Available Info.	7
	Climate Change	1
	Critical Habitat	13
	Current Protection Status	5
	Ecosystem Characteristics/Regimes	8
	General Need for Reliable Info.	1
	Human Attitudes/Beliefs	14
	Impacts, Benefits & Costs	17
	Knowledge Exchanges	17
	Modelling & Analyses	15
	Response or Recovery Strategies	20
	Species Info.	71
	Things Staying the Same	2
Human Systems	Control of Land	33
	Cultural Practices	2
	Desire for Animal Collection/Ownership	16

	Development & Societal Activities	36
	General Society	1
	Gov't Processes & Dynamics	39
	High-Level Efforts (Legal, Policy & Stewardship)	21
	Identity	0.4
	International Agreements & Interactions	9
	Different Jurisdictions	29
	Public Engagement, Involvement & Education	33
	Socio-economic Impacts, etc.	21
	Stakeholders	38
	Technology	7
	Waste Systems & Impacts	6
Natural Systems	Climate Change	6
	Ecological Dynamics, Natural Processes, Ecosystem Services & Roles/Niches	41
	Human-Wildlife Relationships	18
	Invasive Species, Diseases & Parasites	19
	Life Stages	11
	Migratory Species	11
	Population & Distribution Objectives - Optimal Scenarios	11
	Population Dynamics & Extents	62
	Predation & Food Chains	18
	Shared Benefits/Threats/Competition, Interactions/Coexistence; Ecosystem-Based Efforts	26
	Special Species	1
	Specific Habitat Requirements	45
	Taxonomic Diversity & Relationships; Evolution & Hybridization	13
No Adapting - Typical & Predictable	Circumstances Will Remain the Same	26
	Conservation Feasibility	6
	Ecosystem Status	11
	Future Conditions	2
	Habitat Identification	52
	Human Society Limitations to Conservation	41

	Impacts on Humans	31
	Impacts on Wildlife/Nature	77
	Species Status or Well-Being	54
	Wildlife Distribution or Needs	73
Nonlinearity	Chance Events	6
	Climate Change	60
	Conservation Feasibility	2
	Habitat & Environmental Change	44
	Human Perspectives	2
	Wildlife Decisions	16
	Wildlife Needs	6
Precautionary	Assessing/Ensuring Protection	14
	Cost/Benefit Analyses, Impact Assessments & Consultations	52
	Enforcement & Inspections	5
	General Need for Precautionary Approach; Feasibility of Recovery	2
	Habitat Identification & Completeness of Knowledge	8
	Interim or Enhanced Recovery Efforts	17
	Monitoring	10
	Emergency Planning	4
	Recovery Efforts Changing With New Info or Experiences	4
	Risk Management Approach	10
	Species Assessments & Designations	34
Tipping Points	Disturbance Thresholds	50
	General Persistence Thresholds	12
	Permanent Alterations or Irreversible Damage	30
	Vulnerable to Crashes	10
	Vulnerable to Increased Mortality	22
Inclusivity		
Parent Code	**Subcode or Pattern/Theme**	**Contribution Percentage**
	"And Beyond" or Every X # of Years	10

Greater Timescales	Centuries, etc. of Evolution	1
	Critical Habitat Considerations	1
	Decades of Effort	6
	Decades of Recovery Time	3
	Future Activities or Threats	14
	Future Decades of Climate Impacts	1
	Future Status (Economic/Natural Wealth)	0.4
	Historical Info From Long Ago	27
	Long-Term Activities (Leasing, etc.)	0.4
	Long-Term Impacts	6
	Long-Term Objectives/Planning/Monitoring/Evaluating	36
	Long-Term Viability	20
	Multiple Generations	7
	Species' Lifetime, Time to Mature, etc.	10
Future Humans	Being Good Stewards for Multiple Generations	14
	Future Economic & Natural Wealth	14
	Preserving Nature & Its Benefits for Future Generations	43
	Secure Species for Future Generations	29
Future Non-Humans	Future Habitat Conditions	20
	Future Harm	28
	Future Recovery Efforts	18
	Long-Term Impact Evaluation	11
	Long-Term Monitoring or Modelling for Viability & Changes	24
	Long-Term Persistence - General	36
	Well-Being & Persistence of Future Generations	12
Geographic Areas	International Groups & Tools	11
	Latitudes	3
	Oceans	13
	Other Countries or Continents	73
	Outside Canada	8
	Range of International Species	14
	Space	1
	Worldwide	25
Normative Inclusivity	Federal Gov't in Command or Making Commitments; COSEWIC, Enforcement Officers & Her Majesty	70
	Federal Land	32
	Ministers & Governors Contributing or In Command	39

	Other Gov'ts Contributing or In Command or Making Commitments	40
	Provincial Land/Rights	7
	Short-Term Efforts (Monitoring, Research, One-Time Plan Development, etc.)	17
	Short-Term Impact Evaluation	1.4
	Short-Term Positions	0.2
	Short-Term Public Comment Periods	1.2
Potential	Collaboration/Others Contributing to Projects	14
	Combined Efforts	3
	Encouraging/Promoting Others to Do Things or Increasing Others' Awareness	20
	Managers	1
	Many Individuals & Organizations	2
	Other Jurisdictions & Organizations	3
	Other Parties	3
	Partners	45
	Professional Judgment	1
	Researchers	4
	Target Groups	1
	Technical Committee or Working Group	14
	Workshops & Consortiums	3
Present-Day Humans	Considering Input/Participation From Experts, ENGOs, Landowners, etc. (Stakeholders More Generally)	46
	Considering Input/Participation From Indigenous	25
	Considering Input/Participation From the Public	40
	Considering Priorities/Constraints of Participants	8
	Considering the Public's/Stakeholders' Need to Know	40
	Socio-economic Considerations & Benefits to Society	33
Present-Day Non-Humans	Considering Their Environmental Value	6
	Considering Their Human-Specific Value	12
	Considering Their Intrinsic Value	2
	Considering Their Needs (Habitats) & Unique Features	65
	Considering Their Threats/Vulnerabilities	52
	Considering Their Well-Being, Status & Protection	79
Interdependencies		

Parent Code	Subcode or Pattern/Theme	Contribution Percentage
Geographic Areas	Benefits for the World	1
	Climate Change	39
	Helping While Abroad	2
	Knowledge & Data Sharing	41
	Large-Scale Threats	6
	Receiving Benefits Abroad	28
	Supporting Each Other's Efforts	35
	Threats Brought From Abroad	3
	Threats Only Abroad	16
Humans vs. Earth	Climate Change	15
	Earth Relying on Humans for Protection/Mgmt.	86
	Human Well-Being From Earth	8
Humans vs. Non-Humans	Humans Gaining From Biological Resources	12
	Humans Gaining From Ecosystem Services	2
	Humans Gaining From Their Existence	6
	Humans Losing From Their Actions or Existence	4
	Species Gaining From Our Actions	88
	Species Losing From Our Actions	55
Present vs. Future	Preservation for Future Non-Human Generations	4
	Accidental or Unintended Future Benefit	2
	Assess Long-Term Viability	21
	Climate Change	49
	Ensure Long-Term Viability	26
	Impact on Future Human Activities	3
	Impact on Future Outcomes	28
	Long-Term Monitoring & Evaluation (Knowledge for Future Use)	14
	Preservation for Future Human Generations	4
	Reliant on Future Advances in Tech./Knowledge	2
	Reliant on Future Threats Not Being Bad	4
	Species' Decisions Affecting Future Generations	1

Analysis of Coded Data

- General Framework

- Complexity - General Analysis
    - Complexity Code #1
        - Connection to ESL and Research Questions
        - General Analysis
        - Key Themes (How the Aspect of Complexity Was Expressed)
        - Key Findings Based on Key Themes
        - Insights Regarding Biocentric/Ecocentric Perspectives (If Applicable)
    - Repeat With Each Remaining Complexity Code
- Inclusivity - General Analysis
    - Inclusivity Code #1
        - Connection to ESL and Research Questions
        - General Analysis
        - Key Themes (How the Aspect of Inclusivity Was Expressed)
        - Key Findings Based on Key Themes
        - Insights Regarding Biocentric/Ecocentric Perspectives (If Applicable)
    - Repeat With Each Remaining Inclusivity Code
- Interdependencies - General Analysis
    - Interdependencies Code #1
        - Connection to ESL and Research Questions
        - General Analysis

        - Key Themes (How the Aspect of Interdependencies Was Expressed)
        - Key Findings Based on Key Themes
        - Insights Regarding Biocentric/Ecocentric Perspectives (If Applicable)
    - Repeat With Each Remaining Interdependencies Code

1. Complexity

Per the ESL conceptual framework (Figure 1) and the ESL literature explored in the Literature Review, complexity is a major element of ESL. Specifically, supporting ESL looks like acknowledging and understanding complexity across and within human societies, natural ecosystems and Earth as a whole in a manner that strengthens one's ability to understand Earth and its countless interconnected elements (including understanding that not everything is or can be understood, in some cases) for the purposes of making decisions capable of considering and ideally benefitting all parties who share the same planet (for the short and long term). This clarification will guide the analysis of the Complexity code results, allowing one to evaluate if/how complexity as a foundational element of ESL was addressed by the documents.

With Complexity codes being applied the most, one could arrive at various conclusions that may exist on their own or in some combination, such as: 1) Complexity codes are the easiest to apply or their traits are more commonly observed (in this context or perhaps in general), 2) Inclusivity and Interdependencies codes are harder to apply or their traits are more rarely observed (in this context or perhaps in general) and/or 3) there were more Complexity codes (perhaps because it's a more intricate concept and/or was given the most thought) and

thus there was a greater ability to observe aspects of complexity. Certainly any one or combination of these conclusions would require further research to strengthen their case, but at this time I will argue that the first conclusion is likely (strictly in the context of this study as opposed to in general) given that the documents speak heavily on scientific aspects of species/ecosystems/habitats and species management/recovery (including the challenges and necessary baseline knowledge associated with species management/recovery) and therefore tend to favor discussion directly or indirectly relevant to each of the Complexity codes and complexity more generally. The third conclusion is also likely in that there may have been a greater ability to observe aspects of complexity due to the concept being seemingly more intricate than inclusivity or interdependency and subsequently having more applicable codes/elements to consider during the coding process (at least for this study). Examining the Inclusivity and Interdependencies codes further reveals their simplicity and particularly direct relations to their parent ESL principle (Inclusivity codes generally spoke to literal categories of beings/things being included in some manner while Interdependencies codes all spoke to literal beings/things depending on one another in some manner), which contrasts many of the Complexity codes that more loosely related to complexity itself and ultimately challenged the boundaries of the concept (such as Info Gaps or Info Reliability not necessarily being direct or obvious displays of complexity, but requiring additional thought to tie them to complexity). With this enhanced intricacy and expanded possibility (or at least more widespread consideration) of codes that connect to the concept, Complexity as an ESL principle had a greater opportunity to be explored and applied in this study. One could also argue that it would be possible, in the context of this study, to consider more codes for both Inclusivity and

Interdependencies by including items that are less literal or obviously relevant, though that was not the case here. Overall, Complexity codes were applied the most and it may be a result of the selected documents themselves, an inherent advantage granted to Complexity over the other two ESL principles, the way in which the codes were developed in favor of Complexity or a combination of these. It does not necessarily mean that the documents adequately expressed complexity in a manner and/or extent that aligns completely with ESL, but it generally outlines their highly expressed acknowledgment of complexity as a whole.

a. Complexity Code: Adapting

As an aspect of complexity in ESL, adapting is a response to the uncertainty or unpredictability of the Anthropocene that involves enhancing one's ability to adequately handle a variety of circumstances or events, without relying on certainty or foresight as prerequisites, in a manner that is sustainable and beneficial (or at least not harmful) to all connected parties within a system (for the short and long term). Ideally, adapting is a proactive rather than purely reactive response that allows for positive change to be swiftly enacted before or as certain realities or unforeseen consequences unfold, while avoiding always letting circumstances get bad or worse before taking action.

Adapting saw relatively few code applications (the fourth least of all ten Complexity codes) and just one document (Woodland Caribou) accounted for nearly 40% of these applications. Generally, considering each document and document type, Adapting wasn't expressed often (though the RS+APs individually and collectively expressed it more than the other documents/document types), suggesting that SARA does little to promote or support the concept of adapting in the context of ESL and in general.

The ways in which the documents expressed Adapting revealed twelve distinct themes. Key themes include (1) Wildlife Adaptation: Resilience, Persistence & Self-Sustainability, (2) Responding to Outcomes/Evaluations/New Info., (3) Action Despite Uncertainty and (4) Win-Win Scenarios: Adapting to Live With Nature. The first two key themes were the dominant themes for Adapting, having respective contribution percentages of 61% and 44%. This means that the primary manner in which adaptation was supported or expressed in the documents was regarding the importance of non-human species to be resilient and maintain their well-being on their own merits, and the secondary manner was regarding humans adapting their wildlife conservation efforts as new or different information is discovered. These dominant expressions of Adapting do well to support ESL, particularly key theme (1) in how it a) expresses wildlife withstanding/effectively responding to any event or circumstance in the short or long-term (as a desired way to handle the uncertainty/unpredictability of the Anthropocene and arguably life on Earth in general), and b) expresses the ability of wildlife to do this without relying on humans to keep them alive or get them out of a bind (an ideal goal for ESL and conservation supporters alike, as to my knowledge neither have expressed interest in seeing wildlife rely on humans to survive, generally speaking). Key theme (2) supports ESL in that it avoids the predicament where humans are simply not adjusting their thoughts, plans or anything else according to changing circumstances/new information, but it fails to go the full distance in supporting ESL in how it arguably leaves significant room for error by having the process of adapting primarily occur in a reactive rather than proactive sense. Essentially, it's helpful and even crucial to adapt as new knowledge is gained, but it is also helpful and important to be adaptable regardless. Key themes (3) and (4) display extremely straightforward

support for ESL through their expression, and while it is encouraging to some degree that these themes were observed at all, their relatively few applications (24 and 10, respectively vs. 173 and 124 for the two dominant themes) reveal apparent shortfalls regarding SARA's support for the concept of adaptation and subsequently ESL.

Overall, Adapting was generally expressed too infrequently to fully align with ESL (especially given that No Adapting was expressed nearly three times more) and the way in which Adapting was expressed did not outline a clear and consistent support for ESL. By having key themes (1) and (2) as dominant themes, the documents did well to support ESL by acknowledging the importance of having adaptable wildlife in the Anthropocene (without the caveat of them relying on humans to survive or adapt) and demonstrating awareness of needing to adapt once new information is received, but they also failed to give ample attention to adapting in a proactive sense (taking or preparing to take action despite uncertainty), in a holistic sense (speaking to the adaptability of humans, wildlife, habitats and ecosystems and how one can support another, in the context of climate change and in general) and in a practical or logistical sense (what being adaptable in alignment with ESL really involves, requires or looks like). Further, many expressions of adapting capable of showing support for ESL varied in the degree to which they displayed or suggested support for ESL, sometimes leaving space for less effective or incomplete forms of adapting to be deemed sufficient. In summary, Adapting was mostly expressed in two distinct ways that together displayed only partial support for ESL, and certain expressions that offered arguably the most direct/apparent support for ESL (key themes (3) and (4) in particular) were rarely seen at all. With this, the

documents could certainly strengthen their alignment with ESL by expressing Adapting more in general, particularly in a manner that more clearly and consistently serves ESL's purpose.

b. Complexity Code: Info Gaps

As an aspect of complexity in ESL, information gaps (when actually acknowledged or discussed) display a key understanding necessary to achieve sustainable outcomes in the Anthropocene in that we lack knowledge regarding many aspects of our Earth system (and the smaller systems within it), and so we need to act accordingly (combining a seeking out of knowledge with acceptance that certain things may never be known or fully understood and we must then adapt/display caution) to ensure sustainable/beneficial outcomes for all parties on Earth (as opposed to dangerously assuming/presuming we already know everything we need to for decision-making purposes or ignoring the need for knowledge altogether). Importantly, acknowledging information gaps is a crucial step, but failing to show or suggest interest in filling knowledge gaps or adapting to uncertainty thereafter can be problematic and perhaps only displays partial support for ESL. Notably, one could argue that a minimal mentioning of information gaps could simply be because a topic and its intricacies are well known/understood, however in the context of wildlife conservation (including non-human species, their habitats and the various ways in which a species can be threatened or protected), there are inarguably many knowledge gaps and so a minimal mentioning of said gaps is more likely suggesting some degree of ignorance or negligence.

Info Gaps saw the fourth most code applications of all Complexity codes and was applied numerous times in each and every document (although Woodland Caribou and La Mauricie NP each saw over 100 applications themselves and the RS+APs collectively applied it

the most out of the document types). Overall, Info Gaps was expressed often which may suggest support for ESL in this context, although this support can be more accurately assessed by understanding what each information gap is referring to and the degree to which any mentions of information gaps included ESL-supportive ways of responding to said gaps.

The ways in which the documents expressed Info Gaps revealed eleven distinct themes. Key themes include (1) Species Info., (2) Response or Recovery Strategies; Current Protection Status, (3) Incomplete Habitat Identification, (4) Tackling Peoples' Lack of Knowledge, (5) General Need to Fill Gaps, (6) Filling Gaps via Indigenous Knowledge and (7) Accepting Limitations in Knowledge Acquisition. The first key theme is the sole dominant theme with a contribution percentage of 81% (the next most applied theme had a percentage of just 29%), meaning the primary expression of Info Gaps involved knowledge gaps in species-specific information, which outlines a fairly consistent approach to Info Gaps. It also outlines support for ESL, as this form of information gap acknowledgment arguably a) contradicts (or at least limits) the unhelpful notion that humans are superior to other species in our knowledge and ability to make well-informed decisions, essentially humbling us so we can appreciate the complexity within and across species and the care required to take effective action for their benefit, and b) offers opportunity for us to both navigate decision-making/planning without knowing everything and focus our learning on particular areas that will eventually enhance our understanding of Earth's species/system and lead to more sustainable outcomes. However, a high degree of expression for this theme could also represent a misalignment with ESL if those speaking to species-specific knowledge gaps ultimately use the acknowledgement as justification to refrain from taking action and/or don't bother to fill/adapt to any extent of said

knowledge gaps (increasing the risk for less sustainable outcomes), though such intentions were either outright contradicted in some instances or cannot be proven by this study. It should be noted that the majority of this theme's expressions acknowledged information gaps but also stated interest in or even plans to fill said gaps, though little was said about how long filling the gaps will take, what can or will be done in the meantime to protect wildlife, the degree to which filling the gaps will help, and how to respond if certain gaps cannot be filled completely. Thus, the dominant expression of key theme (1) generally shows SARA's support for ESL, but more could be done to enhance this support. Key themes (2) and (3) had relatively moderate contribution percentages at 29% and 22%, respectively, and similar to key theme (1), they represent an acknowledgement of information gaps that bode well for ESL (admitting unknowns regarding species' current protection levels and possible response/recovery strategies is particularly encouraging when there are much less productive alternatives), especially when their expressions often include direct plans to fill certain gaps. However, there is unequal effort put into describing what to do for wildlife while filling knowledge gaps and how to respond if certain gaps cannot be filled completely (or if, upon being filled, more gaps are realized and planned to be filled in a manner that potentially delays action further), signifying a lack of adapting and addressing information gaps productively/sustainably and subsequently leaving room for ESL to be more supported. Key themes (4), (5), (6) and (7) all provide clear and effective pathways to support ESL in their expressions, but all saw small contribution percentages between 3% and 17%. While the presence of these themes is promising for ESL, their increased expression would enhance SARA's alignment with ESL by emphasizing the key and simultaneous pursuit of both gathering and sharing/applying

knowledge to inform decisions and realize more sustainable outcomes (while upholding principles of inclusivity and interdependencies as well, as key theme (6) promotes) and acknowledging and adapting to circumstances where our abilities to gather more knowledge is limited/insufficient.

Overall, Info Gaps was expressed frequently and its form of expression was fairly consistent thematically and in terms of its support for ESL, which was moderate. Dominant and non-dominant expressions of Info Gaps offered genuine acknowledgment of knowledge gaps that impact wildlife conservation (particularly to do with the natural world), plans to address said gaps and the importance of doing so, ways we can fill said gaps while supporting inclusivity, how we should fill others' knowledge gaps to influence positive change and how there are limitations in our ability to acquire new knowledge. However, the latter three items were too limited in their expression, knowledge gaps surrounding climate change and ecosystems were too limited in their acknowledgment (the focus was more on species and habitats, despite all four elements being interconnected), little attention was given to knowledge gaps regarding humans and the role their attitudes, beliefs and experienced benefits/costs play in wildlife conservation and too few expressions properly addressed limitations in filling knowledge gaps and what do to either while filling said gaps or if said gaps can never be filled (which connects this code with Adapting, one that was already stated as being applied contradictory to SARA). Thus, SARA could better align with ESL by enhancing certain expressions of Info Gaps (in quantity and quality and in congruence with Adapting) and connecting this aspect of complexity with inclusivity and interdependencies.

c. Complexity Code: Info Reliability

As an aspect of complexity in ESL, information reliability (when actually acknowledged or discussed) displays a key understanding similar to information gaps: we don't always have the most reliable information to make decisions and so we must act accordingly (combining a seeking out of information confirmation, or perhaps more reliable information altogether, with acceptance that certain things may never be known with complete accuracy and we must then adapt/display caution) to ensure sustainable and beneficial outcomes for all. Also like Info Gaps, acknowledging information reliability (or the lack thereof) is one way to support complexity in ESL, but one should also show interest in ensuring information is reliable or effectively adapting to a lack of reliable information to show full support for ESL.

Info Reliability was the fifth-most applied Complexity code and it saw at least one application in each document, though Woodland Caribou and the SARA legislative document were collectively responsible for nearly half of all applications and many documents (particularly the Mgmt. Plans and MSAPs) saw less than ten applications in each. Overall, Info Reliability was applied fairly often but inconsistently, which may say something about SARA's support for ESL, although the way this code was applied will tell us more about its connection to SARA's support for ESL.

The ways in which the documents expressed Info Reliability revealed thirteen distinct themes. Key themes include: (1) Species Info., (2) Impacts, Benefits & Costs, (3) Modelling & Analyses, (4) Critical Habitat, (5) Best Available Info., (6) Current Protection Status, (7) Things Staying the Same and (8) General Need for Reliable Info. Interestingly, a key element of Info Reliability's thematic analysis is focusing not only on what was directly said regarding information reliability, but also on what was not said or what was alluded to. For example, key

theme (1) was the dominant theme with a contribution percentage of 71%, however many of its expressions were not direct acknowledgments or discussions of the reliability itself of species information, but were instead either assumptions of reliability (based on a lack of mentioning or questioning the reliability altogether) or involved the use of terms such as "likely" and "estimated" to declare that the information may not be irrefutably accurate on all counts but is trustworthy enough to use/act upon without elaborating more on its reliability. Thus, expressions of Info Reliability were fairly consistent since they mostly pertained to species-specific information, however the way reliability was directly or indirectly handled varied across and within certain themes. With this, it would have been easier to thematically analyze Info Reliability (and likely other codes as well) if the themes were categorized better to account for this phenomenon instead of searching for different meanings within the same theme, but this was not thought of until much later. From a high level, Info Reliability displayed support for ESL in select instances where the value of reliable information was acknowledged, the reliability of certain information was questioned (particularly regarding the natural world and its species) or desires or even plans for confirming reliability or finding more reliable information altogether were stated or already executed. Key theme (1) saw such ESL-supportive expressions, including in this excerpt from the Woodland Caribou document:

"Credible information is essential for making sound decisions that result in effective outcomes for species at risk, including boreal caribou. As such, the Government of Canada will lead the creation of a new National Boreal Caribou Knowledge Consortium to enable provinces and territories, Wildlife Management Boards, Indigenous peoples, and stakeholders to address key knowledge gaps, regularly share information and lessons learned, and to undertake studies to support boreal caribou recovery. In addition, the federal government is leading several research projects in collaboration with key partners. For example, research is being undertaken to improve our understanding of the effects of different types of disturbances on populations to support planning. More work will also be done to better understand the impact of a changing climate on boreal caribou survival. The goal of this work is to increase the chances of survival

and recovery of the species in Canada through better knowledge about the species and its habitat."

Such expressions were also offered by key themes (4), (5), (6) and (8), However, key themes (1), (4), (5) and (6) also saw many expressions that did not support ESL, particularly where information reliability was not mentioned or questioned when it perhaps could or should have been (at least to acknowledge the potential outcomes if the information presented is not irrefutably reliable), the reliability was suggested as being imperfect but nothing more was said about it or the reliability was questioned and desires/plans were stated to address the issue but nothing was said regarding what to do in the meantime if action is required or what to do if completely reliable information cannot be attained (requiring us to adapt). Further, key themes (2) and (3) were largely examples of humans presuming/assuming their information is reliable enough without any reason for pause, caution or additional action, while key theme (7) showed clear presumptions/assumptions that circumstances (regarding a species, habitat, ecosystem or the Earth system as a whole) will stay the same and so any current information is reliable and not potentially problematic, which certainly contradicts ESL and the nature of both the Anthropocene and Earth system. With this, Info Reliability arguably presented more of a misalignment with ESL than an alignment, which could be helped by eliminating key theme (7), enhancing key theme (8) and adjusting the way information reliability is viewed and discussed for all remaining key themes.

Overall, Info Reliability was expressed frequently (though far from evenly across all documents) and its forms of expression were wide-ranging thematically but arguably did more to contradict ESL than support it. Dominant and non-dominant expressions of Info Reliability

both contributed to instances of supporting and contradicting ESL, and select themes respectively showed outright support or contradiction but were rare in their expression. Similar to Info Gaps, Info Reliability is connected to Adapting in that, to support ESL, one must adapt to inevitable circumstances where it is impossible to ensure information is completely reliable, but this was not expressed clearly or strongly by the documents. Ultimately, SARA could better align with ESL by enhancing certain expressions of Info Reliability (in quantity and quality and in congruence with Adapting), specifically ensuring there are less presumptions/assumptions regarding information reliability being satisfactory and more displays of understanding that the Earth system is difficult to understand with complete accuracy and that we must respond to this appropriately.

d. Complexity Code: Human Systems

As an aspect of complexity in ESL, human systems and their myriad of elements, variables and interconnections (when discussed even partially) provide necessary context in that the systems humans operate within aside from nature/Earth (those that are built and maintained by humans and perhaps only by humans) are extremely intricate/complex and this (the individual intricacies and systems as a whole) relates to/impacts our ability as humans to create, contribute to and maintain sustainability issues as well as effectively design, implement and evaluate/improve solutions to these issues. In essence, human systems are a significant part of a complex Anthropocene and complex Earth system and are particularly influential regarding sustainability issues (such as the biodiversity crisis) and their solutions (such as wildlife protection/conservation/recovery), therefore acknowledging, understanding and discussing them is essential to ESL and the pursuit of sustainable outcomes for all parties. To

align most with ESL, though, one should avoid discussing human systems as superior over others and should focus on how they can be understood/manipulated/used to bring about sustainable/beneficial outcomes to all those in the same Earth system.

Human Systems was applied the second-most of all Complexity codes and at least ten times in each document, though Woodland Caribou and the SARA legislative document collectively accounted for about a third of all applications and the RS+APs saw the most applications of the document types. This tells us that human systems and the role they play in wildlife conservation certainly wasn't ignored by any document, which is potentially promising for ESL, but nothing substantial can be drawn from this surface-level analysis.

The ways in which the documents expressed Human Systems revealed fifteen distinct themes. Key themes include: (1) Gov't Processes & Dynamics, (2) Stakeholders, (3) Development & Societal Activities, (4) Control of Land, (5) Public Engagement, Involvement & Education, (6) Different Jurisdictions, (7) High-Level Efforts (Legal, Policy & Stewardship), (8) Socio-economic Impacts, etc. and (9) Desire for Animal Collection/Ownership. Notably, there was no clearly dominant theme as key themes (1) to (5) were applied the most and all had contribution percentages between 33% and 39%. Similarly to Info Reliability, the thematic analysis for Human Systems would be easier if the themes weren't only categorizing what aspect of these systems was discussed but also how it was discussed regarding some display of support for or contradiction to ESL. Still, it is useful to know that the main aspects of human systems mentioned in the realm of wildlife conservation include governments and how they operate, individuals and groups outside of government (collectively referred to as stakeholders) deemed capable of impacting and/or being impacted by conservation issues and solutions, how

and why the general public and the activities performed by or for the public is involved and how natural land is manipulated and managed by humans. Ultimately, the way these key themes and all others are expressed primarily signifies a misalignment with ESL, as they mostly serve to simply mention or describe various aspects of human systems as they are (and will presumably continue to be) without questioning the way they operate or mentioning any need for transformative change for the benefit of humans and wildlife as equals within the same Earth system. Rather, the discussed aspects of human systems are largely viewed as immobile elements that are perhaps unnecessary or too problematic or complicated to change, and any conservation efforts should be pursued within the boundaries of human systems without causing much disruption. This is particularly seen in the expressions of key themes (1), (3), (4), (6) and (9). Some expressions of select themes (particularly key themes (3) and (9)) drew attention to the ways an aspect of human systems was/is bringing real or potential (direct or indirect) harm to wildlife, which is an important acknowledgement for supporting ESL, though suggested responses were generally not transformative or disruptive to human systems and focused more on mitigating impacts on wildlife to some extent while still prioritizing human systems over others in the Earth system, making it less likely for sustainable solutions/outcomes for wildlife and the Earth system as a whole to be realized. As well, key themes (1), (2), (4), (5), (6) and (7) often discussed or alluded to ways in which respective aspects of human systems could directly support wildlife conservation, but the innate functions of these aspects and the real/potential impacts on wildlife from their inherent existence or preferred execution or potential corruption/bias (such as the overall control of land by humans across the planet or the private interests of certain stakeholders/governments or jurisdictional

limitations in general) were generally never mentioned/questioned or described as needing changing, thus maintaining/enforcing the overall sentiment that transformative change isn't a priority/deemed necessary and conservation efforts can and should operate sufficiently within certain boundaries of human systems. On a more positive note, key themes (2), (5) and (8) supported inclusivity and interdependencies as key elements of ESL by promoting the value of human perspectives and participation outside of governments/those in power, giving significance to the impacts experienced by these people and acknowledging the connection between public participation and knowledge and positive or negative impacts on wildlife/nature.

Overall, Human Systems was applied frequently and the aspects of human systems deemed most relevant to wildlife conservation were made clear. Thematically, Human Systems was primarily expressed in a manner that contradicts ESL, as it failed to question these systems and seek transformative change within and across them for the benefit of wildlife and the Earth system altogether, instead discussing them as fairly immobile elements that still take priority over natural systems. While many expressions of Human Systems pointed out how these systems are capable of harming and helping wildlife, providing crucial acknowledgements, context and even plans to use human systems to help wildlife that collectively may seem promising for ESL, the underlying perspective/strategy was one that seeks to minimize the disruption to human systems as they currently operate and only implement solutions that can fit reasonably well into the boundaries of these systems and their elements. With this, the scales remain unbalanced in favor of humans, and this likely means sustainability issues will be maintained or even worsen while sustainable solutions/outcomes remain evasive. Going

forward, SARA could significantly enhance its support for ESL by properly addressing this imbalance in its expressions of Human Systems and seeking transformative change for these systems.

e. Complexity Code: Natural Systems

As an aspect of complexity in ESL, natural systems and their myriad of elements, variables and interconnections (when discussed even partially) provide necessary context in that the systems that were not established (and are not solely maintained) by humans and that involve all living (and non-living) things deemed natural are extremely intricate/complex, and this (the individual intricacies and systems as a whole) relates to/impacts our ability as humans to comprehend the existence/value of non-human species, the real and potential sources and extents of harm for these species (both man-made and natural), our direct and indirect abilities to support the well-being of these species and how humans can be impacted by imbalances in natural systems. In essence, natural systems are a significant part of a complex Anthropocene and complex Earth system and are key to humans productively understanding problems that impact any number or type of living thing as well as the solutions to these problems. Thus, acknowledging, understanding and discussing natural systems (in a variety of capacities) is essential to ESL and the pursuit of sustainable outcomes for all parties. To align most with ESL, though, one should avoid discussing natural systems as inferior to human systems or as systems that can ultimately be controlled/maintained by humans alone, and should focus on how our understanding of natural systems can fuel transformative change in how humans conduct themselves to ensure sustainable/beneficial outcomes for all parties in the Earth system.

Natural Systems was the most applied Complexity code and it was applied rather generously across each document, although Woodland Caribou and RS+APs in general saw the most applications of the documents and document types, respectively. This may signify a general alignment with ESL through a widespread and fairly consistent display of acknowledgment/understanding regarding natural systems, though one could argue such a display is not surprising given that the documents inherently involve drawing on the intricacies of natural systems to effectively present wildlife conservation problems and solutions. As well, it is yet to be determined if applications of this code generally align with the transformative nature of ESL.

The ways in which the documents expressed Natural Systems revealed thirteen distinct themes. Key themes include: (1) Population Dynamics & Extents, (2) Specific Habitat Requirements, (3) Ecological Dynamics, Natural Processes, Ecosystem Services & Roles/Niches, (4) Shared Benefits/Threats/Competition, Interactions/Coexistence; Ecosystem-Based Efforts, (5) Invasive Species, Diseases & Parasites, (6) Human-Wildlife Relationships, (7) Population & Distribution Objectives - Optimal Scenarios and (8) Migratory Species. Key theme (1) was the dominant theme with a contribution percentage of 62%. With this and the contribution percentages of other key themes, the aspects of natural systems given the most attention can be summarized as the complex ways in which a species conducts themselves (circumstantially and in general) and the complex interactions and cycles that define an ecosystem (both in terms of what non-human species impact/influence and the forces that impact/influence them). These are key parts of natural systems, particularly in terms of wildlife conservation, and so their level of acknowledgment by the documents is encouraging. From a high level, though,

the primary way in which aspects of natural systems are discussed is one that is problematically unholistic, particularly by largely excluding (or only inconsistently mentioning) both how natural systems see (potentially unpredictable) changes with time and how these systems continuously interact with and are impacted by human systems (raising the question whether one can properly discuss one without the other in the Anthropocene), and stops short of being transformative in alignment with ESL, specifically by suggesting it is sufficient to understand natural systems as they are and keep them stable according to our (incomplete) understanding of what that looks like. Essentially, natural systems were well-acknowledged in their complexity but generally treated as items that can ultimately be understood enough to maintain them in healthy states while minimizing disruptions to humans and their systems, perpetuating the idea that nature and perhaps Earth as a whole can be sustained within a human-centric framework. Key themes (1) through (5) all expressed this through the majority of their applications, though key theme (7) in particular expressed this strongly by reducing natural systems and their complexities down to more simplistic objectives describing optimal states of these systems that humans can play a significant role in establishing and maintaining, ultimately providing pathways forward for wildlife conservation that rely on natural systems being comprehensible and even controllable (now and through time, which contradicts the reality of nature and ESL's proclaimed need for adapting to uncertainty) as well as humans and human systems capable of realizing impactful actions and adjustments without totally rethinking how natural and human systems should coexist for their mutual benefit over the short and long-term (something that ESL supports). Below is an example:

"The population and distribution objective is to maintain a stable population of Sable Island Sweat Bee distributed across its current area of occupancy (2019). Meeting this objective will

involve: (i) addressing key knowledge gaps (e.g., species' needs, biology, abundance, distribution and threats) so that suitable habitat can be described and subsequently protected habitat by 2025; and (ii) reducing and preventing key threats (e.g., ensuring no invasive species are introduced to the island; ensuring no suitable habitat is disturbed or permanently lost due to human activity, which may include restoration of suitable habitat where required).
…
In order to achieve the population and distribution objectives for the Sable Island Sweat Bee, the immediate focus of recovery and conservation efforts will be to prevent and reduce threats to the extent possible and maintain habitat at known sites while addressing knowledge gaps to better understand and protect the species and its habitat in the future. Specific recovery measures involving site stewardship and management, impact assessment and mitigation, development and implementation of best management practices, education and awareness initiatives, restoration activities and research and monitoring have been identified as high priorities over the next five years."

Key theme (7) even outright stated in many instances that the achieving of these population and distribution objectives will be subject to priorities and budget constraints of the humans involved, providing clear evidence that efforts to support natural systems and wildlife specifically are being limited to the present-day frameworks and boundaries of humans and their systems. It is important to note that some expressions of these key themes were more supportive of ESL, including one for key theme (7) regarding black-tailed prairie dogs that spoke to the uncertainty regarding the status of natural systems in the present and future, uncertainty regarding the present/future relevance or efficacy of outlined conservation actions and the previously/currently problematic interactions between select humans/human systems and this species and how coexistence will have to be established. However, such displays of support for ESL were not the dominant manner in which Natural Systems was applied.

Overall, Natural Systems was applied considerably across all documents and its applications generally showed a clear acknowledgment of both the large and small scale complexities within/across these systems. However, the thematic analysis revealed that the

complexity of natural systems is generally perceived as something humans can adequately comprehend and manipulate to ensure sustainable outcomes for wildlife without deeply examining or transforming/disrupting how humans and human systems operate on their own and in relation to natural systems. This is outlined by the majority of the key themes' expressions and ultimately displays an apparent misalignment with ESL. It is at least encouraging to see individual and groups of species have their unique qualities, circumstances and impacts be acknowledged (through key themes (1) through (5) especially), unique interactions between these species and humans be described (through key theme (6)) and species' ways of existing outside of human systems be noted (such as through key theme (8) in how species don't acknowledge man-made geographic borders), but more could have been done to holistically discuss natural systems as items that are intrinsically linked to humans and their systems in the Anthropocene and to discuss/pursue the necessary transformative changes to truly realize sustainable outcomes via enhanced coexistence and equity between humans and other species, which outlines a path for the documents to better align with ESL.

Speaking to biocentric and ecocentric perspectives, the thematic analysis of Natural Systems revealed some degree of support for these perspectives in how the existence and unique characteristics of various species were regarded as valuable, along with the services they provide that maintain ecosystems and (on their own and through entire ecosystems) benefit living and nonliving things (and the Earth system as a whole, including humans). However, in line with the ESL misalignments mentioned above, the support for these perspectives was generally limited within human-centric frameworks where underlying

goals/priorities are to maintain the superiority complex of humans and ensure minimal disruption to human systems.

f. Complexity Code: No Adapting - Typical & Predictable

Not adapting is a clear contradiction rather than an aspect of complexity in ESL. Instances where adapting is not supported by instead stating or suggesting that things can be described as typical or predictable (and therefore do not necessitate the need to adapt to uncertain or unpredictable circumstances) can generally be declared as misalignments with ESL in the context of this study.

No Adapting was applied the third-most of all Complexity codes and saw applications in every document, although Woodland Caribou and the SARA legislative document were collectively responsible for over a third of the applications and RS+APs applied it the most out of the document types. With No Adapting being applied so often and relatively consistently and with Adapting seeing nearly three times less applications and numerous documents with little to no applications at all, SARA is displaying a weak relationship with adaptation in the Anthropocene that is clearly misaligned with ESL.

The ways in which the documents expressed No Adapting revealed ten distinct themes. Key themes include: (1) Impacts on Wildlife/Nature, (2) Wildlife Distribution or Needs, (3) Species Status or Well-Being, (4) Habitat Identification, (5) Human Society Limitations to Conservation, (6) Impacts on Humans, (7) Circumstances Will Remain the Same and (8) Future Conditions. Key themes (1) and (2) were dominant themes with respective contribution percentages of 77% and 73%. With these and other key themes, the main topics discussed as being predictable (and therefore not requiring us to adapt in some context) include the positive

and negative impacts that recovery efforts (or a lack thereof) will have on wildlife/nature, where species are located, what influences their well-being and the status of their well-being. In other words, the documents suggest that matters involving non-human species that are intertwined with conservation efforts are largely predictable and so there is little need to be adaptable when dealing with these matters. Notably, similarly to Info Reliability, the expressions of No Adapting and its themes generally did not outright state something as being predictable and/or contradictory to the need for adapting, but it was suggested by providing confident statements without outlining any need to address potential or actual uncertainty. Below is an expression of key theme (1) that displays this phenomenon:

"Recreational activities involving human intrusions into wolf habitat (e.g., wilderness camping) could have an impact on the Eastern Wolf packs affected. Wolves display avoidance behavior to humans and tend to relocate newborn pups following a disturbance of their den or rendezvous site (Frame et al. 2007; Argue et al. 2008). This threat is not well documented. If we include all the types of recreational activities that take place in the range of the Eastern Wolf (e.g., snowmobiling, ATV use, boating, hiking), its scope is pervasive. However, the severity of the threat was assessed as negligible since the current known area of occupancy of the Eastern Wolf is mainly located in parks or wildlife reserves where these activities are well regulated."

The above expression contains numerous confident statements regarding the Eastern Wolf, but one to note here is where it's said the threat was ultimately deemed negligible based on a few seemingly predictable factors (i.e., where the species is found and the degree of protection offered to them at those locations), and it is suggested there is no need to adapt to uncertainty regarding the threat in question as it will presumably continue to be negligible given that where is the species is and the (adequate/sufficient) protection awarded there will presumably not change. This and other similar expressions that represent the majority for No Adapting and its key themes (1) through (4) ultimately display a strong misalignment with ESL by suggesting

being adaptable in the Anthropocene is unnecessary in a variety of contexts as numerous aspects of species and conservation efforts are apparently predictable or typical. Naturally, this misalignment with ESL is displayed by all other key themes as well. Expressions of key theme (5) are unique in that they mention the limits humans give themselves regarding conservation efforts (which can be straightforward such as requiring efforts to be cost-effective and to adhere to some limited financial budget, or more complex such as having efforts and their impacts be predicated on peoples' acceptance of a species or having efforts focus on educating people participating in an activity rather than restricting the activity itself), but these expressions are still predominantly displaying a misalignment with ESL by stating or suggesting that such limits are typical and generally unchanging, which suggests the limits themselves and perceptions about them (and hence humans) will not adapt to the dire circumstances many non-human species are in that give reason for such conservation documents in the first place. Expressions of key theme (6) are similar to those of key theme (1) but focus on humans instead, and so they also misalign with ESL by suggesting various impacts are predictable/known and lack the uncertainty to necessitate adapting, although the consequences from these expressions would fall more on humans than wildlife (which is of course still problematic for ESL and in general). Expressions of key theme (7) contradict ESL in a more general sense by suggesting the presumed continuation of a given circumstance isn't associated with enough uncertainty to necessitate adapting, regardless of the species that's directly involved. Finally, expressions of key theme (8) are problematic for ESL in that they mention circumstances of the future that may not necessarily match today's circumstances but are still seemingly predictable enough to state how things will be without taking the opportunity to acknowledge any degree

of uncertainty and the need to adapt to said uncertainty. In essence, every expression of No Adapting likely displays a misalignment with ESL and each expression generally does so in the same way, though they primarily focused on wildlife-specific matters as the elements deemed predictable.

Overall, No Adapting was applied heavily and across every document, and its applications (considering them on their own but also in relation to that of Adapting) outline a clear contradiction to ESL and its inherent involvement of adapting. This contradiction is displayed for a variety of topics but is generally consistent in that it involves suggesting something as being predictable or typical enough for humans to adequately handle the relevant outcomes without any clear need to be adaptable before or during the experience. One could argue that many things simply are predictable/known or at least can be predicted/known well enough to justify both assigning a high degree of confidence to a statement and excluding any mention of uncertainty and/or the need to be adaptable, especially since a) humans cannot be expected to discuss the uncertainty associated with something (or the need to be adaptable) in every instance and b) at some point regarding certain topics/circumstances/contexts, humans arguably have to label something as being generally accepted/viewed as typical to make more sense of the world around us and subsequently make timely decisions, and so perhaps some or many of No Adapting's expressions are unreasonable to associate with a misalignment with ESL. However, given that a) many expressions of No Adapting were centered around matters associated with an arguably fair amount of uncertainty, including species-specific or ecosystem-specific characteristics that we knowingly do not (and perhaps cannot) comprehend in their entirety as well as future outcomes/consequences/circumstances that we literally cannot be

fully certain about, and b) this study is based around applying an ESL perspective, which as a concept aims to be disruptive and promote adapting as a more effective way to navigate the Anthropocene and avoid repeating old patterns that clearly failed to address sustainability issues thus far, it is considered reasonable for this study to mark the expressions of No Adapting and its key themes as generally contradictory to ESL. This does not necessarily mean the documents must enhance their support for ESL by addressing any potential uncertainty and the need for adapting in every possible instance, but in the least, this analysis and its takeaways should provoke enhanced consideration in support of ESL when one is writing or reading statements resembling the expressions of No Adapting described in this study.

g. Complexity Code: Nonlinearity

As an aspect of complexity in ESL, nonlinearity describes the Earth system as a complex one where its outputs or circumstances through time are not proportionate to its inputs or events/processes occurring beforehand. In other words, one cannot expect certain circumstances to unfold across the Earth system by relying on their knowledge of what happened prior to those circumstances as though the impacts will match the scale and/or characteristics of what happened prior. With this, aligning with ESL looks like directly or indirectly acknowledging nonlinearity within the Earth system, either generally or regarding a specific item or scenario such as climate change, and ideally expressing how this acknowledgement can/should/will impact decision making or behavior to foster more sustainable outcomes in a complex Anthropocene (such as letting go of expecting outputs that are proportionate to their inputs and adapting to/preparing for a wider variety of future circumstances/outcomes, including those that are entirely unpredictable).

Nonlinearity was the second-least applied Complexity code, excluding No Complexity (which was essentially given up on as a code). Half of the documents never applied Nonlinearity while most of the remaining documents applied it ten times or fewer, save for Woodland Caribou which accounted for nearly half of the code's 63 total applications. This analysis certainly suggests that nonlinearity as a concept is rarely acknowledged by SARA, representing a misalignment with ESL.

The ways in which the documents expressed Nonlinearity revealed seven distinct themes. Key themes include: (1) Climate Change, (2) Habitat & Environmental Change and (3) Chance Events. Key theme (1) is the dominant theme with a contribution percentage of 60%. Thematically analyzing Nonlinearity was rather tricky, given that the term itself was never explicitly mentioned and that it is often not straightforward to discern whether or not (or how) the nonlinearity of something is being discussed indirectly (which is problematic itself from an ESL perspective since the documents could have done much better to acknowledge and discuss nonlinearity directly), but ultimately the documents often displayed limited/weak acknowledgements of nonlinearity and did little to express how any nonlinearity can/should/will impact circumstances or decision making for wildlife conservation, outlining a misalignment with ESL. Key theme (1)'s expressions of nonlinearity followed this trend at times, though it is important to first explain the context of climate change and nonlinearity in that climate change, both as an output (related to inputs such as natural carbon cycles and human atmospheric pollution) and as an input (leading to impacts on living and nonliving things in the Earth system), can be considered nonlinear in nature as its own characteristics/behaviors are not necessarily proportional to its inputs in every instance and the characteristics of its impacts

are not always proportional to its own magnitude. With this, one might expect some degree of mentions of climate change to involve acknowledging its nonlinearity and the implications of such. However, in the documents, climate change as a key theme for Nonlinearity was often suggested as being either linear as opposed to nonlinear (e.g. statements about climate change advancements leading to proportionately increased frequencies of forest fires, droughts and severe weather events in general) or nonlinear but with little or no regard for the implications (e.g. a statement about how Sable Island, home to the Sable Island Sweat Bee, is seeing a disproportionately hotter climate due to climate change and could experience a variety of potential climatic circumstances over the next century, but there's a lack of clear communication regarding how such nonlinear circumstances will be handled in their entirety for the species' benefit), both representing some degree of misalignment with ESL, or else its linearity/nonlinearity wasn't discussed or alluded to at all (e.g. general statements regarding climate change impacts that may or may not be proportional to climate change's magnitude or characteristics) which is arguably also problematic for ESL as it leaves space for climate change and/or its impacts to be interpreted as linear, potentially leading to poor decision making and less sustainable outcomes. Some expressions of key theme (1) did well to express climate change as a nonlinear input or output and even described some degree of caution or action taken in response to its nonlinearity, but these expressions were too few in number and certainly weren't expressed across all or even half of the documents. Expressions of key theme (2) generally mirrored those described for key theme (1), often describing habitat and environmental change (either as an output or an input in a system) as linear and fairly straightforward, though there were a couple notable expressions that explicitly pointed out

certain species or populations of a species as being more vulnerable to habitat/environmental change than others, stating or suggesting that the impacts from such changes would be disproportionate and therefore warrant additional caution and/or recovery actions. Such instances represent support for ESL, though they were too rare in both a relative and absolute sense. Key theme (3)'s expressions involved explicit mentions of chance or stochastic events, representing a clear acknowledgment of some degree of nonlinearity within the Earth system and natural systems in particular and even going so far as to associate such acknowledgements with a need for additional caution and/or recovery objectives to ensure sustainable outcomes for species. These expressions display support for ESL, but there are only four of them in total spread across just three documents, so their relative and absolute contribution is weak and they ultimately serve more as an insight into how the documents could better support ESL in the future.

Overall, Nonlinearity was too rarely and too inconsistently applied within and across the documents to display a strong or clear support for ESL. Further, its thematic analysis revealed that most of its expressions either contradicted or undermined something's nonlinearity (by stating or suggesting something as being more of a linear input/output in a system), indirectly acknowledged something's nonlinearity without describing/responding to the implications of such or just refrained from stating/suggesting something as being more nonlinear or linear (which can arguably also be problematic for ESL). Given this and the fact that any expressions of Nonlinearity that clearly displayed support for ESL were fairly rare within and across documents, Nonlinearity's application in SARA ultimately revealed a stronger contradiction to than support for ESL. It could be argued as unreasonable for any document (let alone a

collection of documents) to acknowledge and expand on the nonlinearity of something at every possible opportunity, but given that the documents in question aim to enhance wildlife conservation by understanding and (in certain contexts) adjusting how a species interacts with themselves, other species, the environment and humans, it is arguably reasonable for these documents to better support ESL by acknowledging/discussing nonlinearity more directly, more often and more productively to ensure the full complexity of the Earth system (and all systems within it) is being considered/understood, both within the documents and in their implementation, to a degree that more effectively supports decision making to foster more sustainable outcomes for all parties.

h. Complexity Code: Precautionary

As an aspect of complexity in ESL, precaution refers to taking some kind of action now in an attempt to avoid a potentially or likely bad/worse/less sustainable outcome in the future, regardless of how much certainty is presently associated with the current and/or future circumstances in question. In a complex Anthropocene/Earth system where an innumerable amount of interacting variables are at play, making past, present and future circumstances difficult/impossible to fully comprehend for the purposes of decision making and ensuring sustainable outcomes for all parties, it is arguably a productive/positive endeavor to consider and exercise various precautions to lessen the risk of a poor outcome and increase the odds of a more sustainable outcome being achieved in the future. With this, supporting ESL looks like acknowledging the need for precaution and, better yet, stating or suggesting that precautions will be taken in an attempt to ensure more sustainable outcomes for all parties. Importantly, certain mentions/discussions of precaution can be more supportive of ESL than others, as one

could discuss the need for or outright exercise precaution with good intentions, but the manner in which precaution is being discussed or exercised may lack the level of transformative effort required to be truly impactful according to ESL (e.g. taking weak precautions seemingly for the benefit of wildlife that were ultimately designed/chosen for their minimal disturbance to humans/human activities that can still harm wildlife to some degree).

Precautionary was the fourth-least applied Complexity code, excluding No Complexity. It was applied in every document (though only applied ten or fewer times in some documents), but was applied the most by RS+APs. Notably, Woodland Caribou saw nearly a quarter of the total applications itself (108 of 464), and the La Mauricie NP as well as the SARA legislative document both saw relatively high amounts of applications compared to most other documents. Overall, Precautionary was applied a fair amount and this may suggest some degree of support for ESL, though it was very inconsistently applied across documents (potentially problematic for ESL) and a deeper analysis is required to confirm how and to what degree its application related to ESL.

The ways in which the documents expressed Precautionary revealed 11 distinct themes. Key themes include: (1) Cost/Benefit Analyses, Impact Assessments & Consultations, (2) Species Assessments & Designations, (3) Interim or Enhanced Recovery Efforts and (4) General Need for Precautionary Approach; Feasibility of Recovery. Key theme (1) is the dominant theme with a contribution percentage of 52%. At a high-level, the ways in which Precautionary was applied generally speaks to at least a partial support for ESL that is promising, due to some explicit mentions of the precautionary principle, the benefit(s) of exercising precaution and fairly common descriptions of measures that are technically precautionary in nature being or

planning to be taken. However, one could argue the code could have been applied more (in general as well as consistently across each document) to enhance its impact and, perhaps more importantly, many of its applications, much like those for Human Systems and Natural Systems, stopped short of being transformative and ultimately displaying a more complete support for ESL in how precaution, as a concept overall and/or regarding its application specifically, was (at times) seemingly framed in a manner that minimizes disruption to the status quo (regarding humans, human systems and their dominant status over nature and non-human species) and subsequently gives little hope to believe those precautions will successfully foster more sustainable outcomes for wildlife from an ESL perspective. Key theme (1) certainly showcases this incomplete support for ESL as its expressions display precaution in wildlife conservation through the consideration of costs and benefits of recovery actions, impacts on wildlife from human activities and impacts on people from recovery actions and certain forms of planning/execution. Such expressions are clear in that the actions being taken or to be taken are technically precautionary in nature as they are not technically necessary or unavoidable actions, but are additional/optional measures being taken to attempt to avoid bad outcomes and foster better ones (for example, one does not necessarily need to consider and publicly share the socio-economic costs and/or benefits of select conservation efforts to plan and implement them, but it's a measure being taken to avoid undesired outcomes such as harming one's democracy by keeping the public in the dark about actions that may harm and/or help them). However, many of these expressions are questionable in how capable their exercising of precaution is at fostering more sustainable outcomes (in general but particularly for wildlife, the primary subjects of the SARA documents). One example is key theme (1)'s expressions

where plans are made for various government and wildlife management groups to collectively assess whether current legal protections for certain species on non-federal lands are sufficiently effective. Nothing is clarified regarding how such assessments will be executed (i.e. what guiding philosophies or processes will be used) and it's ultimately unclear what constitutes as sufficiently effective protection in a given circumstance, so from an ESL perspective one might reasonably expect such assessments to simply maintain current scenarios where legal efforts exist to protect species only for more sustainable outcomes for such species to remain elusive. Another example is key theme (1)'s expressions where plans are made for environmental assessments to be undertaken prior to or during human activities (such as the development of infrastructure on natural lands) with aims to identify and minimize impacts on wildlife. Similar to the analysis for Human Systems, such mentions of assessments are generally framed as being a small aspect of human societies and their activities rather than a prerequisite or guiding philosophy, and so it's reasonable to expect such assessments to ultimately prioritize the value and eventual continuance of the human activity over the well-being of wildlife. Further, no information is provided to clarify how these assessments will be conducted and how the assessments as precautionary measures will help foster more sustainable outcomes for wildlife in reality (once the dust settles), again making it difficult for one to expect the precautions to be successful for wildlife from an ESL perspective (especially since conducting similar environmental assessments is already normalized in a variety of scenarios in Canada among other jurisdictions, and the outcomes for wildlife have yet to suggest that such assessments are sufficient given the pervasiveness of the biodiversity crisis). Thus, key theme (1)'s expressions suggest that precaution was discussed and even exercised, but not necessarily in the

transformative manner required to fully support ESL and properly foster more sustainable outcomes for all parties. Expressions of key theme (2) were also mixed in their support vs. contradiction of ESL but perhaps in a more apparent way, with many descriptions and labels assigned to a species' status/well-being often having either reasonable and productive precautions attached to them or no precautions at all. Expressions of key theme (3) often did well to support ESL by outlining tangible (though sometimes just temporary) recovery actions that resemble precautions that are being or will be taken for the benefit of wildlife, though the theme only has a contribution percentage of 17% and one could argue some of these precautions are questionable much like those expressed by key theme (1), leaving considerable space for key theme (3) to further enhance its support for ESL. Key theme (4) represents instances where being precautionary is explicitly mentioned and expressed as valuable, often in the context of attempting to recover a species in general despite uncertainty in recovery feasibility, which certainly displays support for ESL, but there are only eight expressions of this theme and having more would likely enhance the support for ESL.

Overall, Precautionary was applied hundreds of times but still less than most other Complexity codes and very inconsistently across all documents, suggesting that greater support for ESL could be expressed by acknowledging and discussing precaution more often and more evenly across the documents. In terms of how Precautionary was applied, the thematic analysis revealed mixed results whereby exercising precaution was discussed, valued as part of conservation efforts and described as happening or soon to be happening for many species, but the precautions themselves often lacked promise in their apparent ability to escape the status quo that ESL seeks to eliminate/surpass and truly foster more sustainable outcomes for wildlife

and humans equally. In other words, Precautionary's applications collectively revealed some degree of support for ESL (perhaps an encouraging amount) but considerable changes must be made in terms of the quantity and quality of code applications to solidify the documents' support for ESL on the matter of being precautionary.

Speaking to biocentric and ecocentric perspectives, the thematic analysis of Precautionary revealed a kind of basic support for these perspectives in that there is an apparent desire and commitment to take precautions for the benefit of wildlife and/or ecosystems and to have readers/the public consider the non-utility-based valuations of wildlife and ecosystems as an experienced benefit for humans from conservation efforts. However, the support for these perspectives is limited by 1) discussing precautions that, as mentioned, are often seemingly designed to maintain rather than transform the status quo and are therefore likely unable to foster more sustainable outcomes from an ESL perspective, and 2) stating or suggesting that the significance of such precautions are most strongly tied to benefits for humans. If the precautions themselves are incapable of having positive impacts on wildlife/ecosystems that truly reflect long-term success for their well-being (as though the well-being of wildlife/nature is equal in value to that of humans as part of the Earth system), then perhaps only the intention but certainly not the exercising of precaution as a whole can be aligned with biocentric/ecocentric perspectives. Further, if the purpose of the precaution is to benefit wildlife/ecosystems but that benefit's significance is more strongly tied to how it ultimately benefits humans than how it directly benefits wildlife/ecosystems alone, any alignment with biocentric/ecocentric perspectives is weakened or even severed as the value according to humans is being prioritized over the inherent value of wildlife/ecosystems. Thus,

Precautionary as it was applied showed potential in aligning with biocentric/ecocentric perspectives, but changes must be made regarding what precautions are taken and the discussed significance in taking them to solidify any alignment.

i. Complexity Code: Tipping Points

As an aspect of complexity in ESL, tipping points describe thresholds in the Earth system's equilibrium that, once exceeded, result in permanent changes capable of impacting various or perhaps all variables across the system. Respectively, these tipping points pertain to one or multiple aspects of the Earth system and it is in the interest of all parties within the Earth system to ensure such points are never reached let alone exceeded. With this, supporting ESL looks like acknowledging the existence of said tipping points and the need to avoid reaching them, and ideally using them as considerations in decision-making to help foster more sustainable outcomes for all parties in the Earth system.

Tipping Points was the least applied Complexity code, excluding No Complexity, with five documents seeing zero applications and only two documents seeing more than five applications. Woodland Caribou and RS+APs in general saw the most applications with 22 and 36 out of 50, respectively. Taken together, this certainly suggests a misalignment with ESL, which is concerning given the immense role played by biodiversity in the Earth system's equilibrium and the documents' collective aim to protect wildlife.

The ways in which the documents expressed Tipping Points revealed five distinct themes. Key themes include: (1) Disturbance Thresholds and (2) Permanent Alterations or Irreversible Damage. Key theme (1) is the dominant theme with a contribution percentage of 50%. According to how it was applied, Tipping Points displayed only weak support for ESL in

select instances and overall displayed more of a misalignment with ESL than anything else. Notably, the term "tipping point" was never used itself and tipping points at the Earth system level were never mentioned, limiting the documents' ability to relate species or ecosystem-level conservation issues/efforts with the bigger picture that is the Earth system, its equilibrium and the roles played by species and their habitats in both maintaining balance/avoiding tipping points and being impacted by them once they are reached/exceeded. With this, any reference to a tipping point was generally limited to a scope that was species and/or habitat specific. Further, these tipping points were often only discussed as estimates (things that are likely to happen or simply just in the realm of possible) where the extents of an undesired outcome are to be avoided according to a human's own preferences for risk avoidance, rather than definitive thresholds that should be avoided at all costs, arguably limiting the urgency or significance one might assign to a circumstance involving a species/habitat and its tipping point. As well, proposed actions to avoid reaching certain tipping points (in other words, the ways in which decisions were influenced by knowledge of select tipping points) are questionable regarding their capability of succeeding from an ESL perspective as some are overly general, rely heavily on acquiring and maintaining accurate information and/or are dictated by the opinion of one or more humans. Many of key theme (1)'s expressions display weak support for but ultimately a misalignment with ESL as they describe species-specific tipping points in the form of disturbance thresholds. One example is taken from the Eastern Wolf Mgmt. Plan, as seen below:

"1.3 Identify dispersal corridors and potential areas of colonization in the range of the Eastern Wolf in order to plan and implement measures that reduce the human footprint (e.g., trapping and hunting, roads, agriculture) to thresholds acceptable for the species."

To say there are human disturbance thresholds acceptable for the species insinuates there are also thresholds that are unacceptable to the species, suggesting there is a sort of tipping point regarding human disturbance that, if reached/exceeded, would prove problematic (potentially irreversibly so) for the species. This could be argued as a display of support for ESL in that a tipping point of sorts was acknowledged for a species and a general action was proposed to avoid reaching/exceeding this tipping point. However, this tipping point for the Eastern Wolf was never fully expanded upon or clarified in the document, and subsequently a more specific/actionable/helpful path to ensure the point is never reached/exceeded remains elusive, which is problematic for conserving the species and ultimately displays more of a misalignment with than support for ESL. Expressions of key theme (2) focus more on explicit mentions of (potentially or definitively) irreversible/permanent impacts on one or more species, but still generally display a misalignment with ESL largely by leaving the determination of something as a contributor to a tipping point up to the discretion of select (potentially biased and/or unqualified) humans and/or by having implications from the acknowledgement of tipping points be overly general and unclear in their impact on avoiding such points.

Overall, Tipping Points was rarely applied and only in 11 of 16 documents. As well, its thematic analysis revealed that any mention of the concept was limited to the species or habitat-specific scale and generally failed to adequately describe the tipping point itself and the response required to avoid reaching/exceeding said point in a manner suitable for fostering more sustainable outcomes for wildlife from an ESL perspective. Taken together, this outlines a clear misalignment with ESL that could be transformed into support for ESL if 1) tipping points are mentioned more often and more consistently across all documents, 2) tipping points are

also discussed at the Earth system scale to tie species or habitat-specific issues/solutions to the bigger picture and 3) regardless of the scale of a tipping point, each one is discussed/imbued with more clarity, detail and productive intentions to foster more sustainable outcomes for wildlife in the Anthropocene.

Speaking to biocentric and ecocentric perspectives, the thematic analysis of Tipping Points revealed that the documents generally did not connect the purpose of acknowledging the existence of and/or discussing ways to avoid reaching/exceeding various tipping points with the inherent value of living things/ecosystems. Such mentions of tipping points were likely or even clearly there for the benefit of select species and their ecosystems, and this perhaps offers a degree of indirect alignment with biocentric/ecocentric perspectives, but there was only one instance where a tipping point (and the need to avoid reaching/exceeding it) was explicitly tied to the inherent value of wildlife (and ecosystems more indirectly), providing only a weak connection between tipping points and the two perspectives where a much stronger connection could have been established and maintained across all documents. Also, as mentioned, the quality of code applications for Tipping Points was generally poor or questionable from an ESL perspective, so any indirect support for biocentric/ecocentric perspectives currently displayed through mentions of tipping points is limited/weakened further. To better align with biocentric and ecocentric perspectives, the significance of tipping points (in their acknowledgement as well as discussions surrounding their avoidance) must be more clearly and consistently tied to the inherent value of non-human species and ecosystems.

j. Complexity Code: No Complexity

No Complexity was originally considered as a Complexity code because it was thought it could be used to outline instances where complexity in the Earth system/Anthropocene was outright rejected (essentially revealing clear contradictions to certain aspects of complexity in ESL and ESL altogether). Ultimately, though, it proved to be a difficult code to apply consistently and in general, and it was essentially given up on naturally at some point during the coding process. This has to do with the unclear concept of lacking complexity itself, as it is time-consuming and difficult to evaluate whether certain text exhibits simplicity over complexity and what elements make something undoubtedly or probably complex. Such abstract and ambiguous/subjective thinking was declared too difficult to apply in this study and likely wouldn't have provided much value based on this study's objectives. Also, there are enough Complexity codes and conclusions to be drawn from them aside from No Complexity, and so its abandoned application is not problematic for this study. With this, there is no analysis to discuss regarding No Complexity.

2. Inclusivity

Per the ESL conceptual framework (Figure 1) and the ESL literature explored in the Literature Review, inclusivity is another major element of ESL. Specifically, supporting ESL looks like consistently and productively/comprehensively including the perspectives, needs and well-being of all humans and non-human species (as objectively as possible to account for any bias) in all aspects of legal decision-making and, more generally, the pursuit of justice. Importantly, for such inclusions to truly foster sustainable outcomes, living beings both in the present-day and future (including those not yet alive) must be considered, as this makes it more likely that all parties' experienced benefits will be sustained beyond just the next few years (a time scale

humans are often guilty of focusing on/making decisions around). As well, this exercising of inclusion must also account for historical/maintained imbalances/inequalities between humans and non-human species, between groups of humans and between groups of non-human species, and should therefore take an approach that emphasizes equality and equity to ensure the inclusion process itself as well as its outcomes properly benefit all parties in the Earth system. Ultimately (from an ESL perspective), the purpose of this form and extent of inclusion in legal decision-making is to transform the writing and implementation of human laws to foster more sustainable outcomes for all parties in the Earth system.

Altogether, Inclusivity codes were applied significantly more than those for Interdependencies but significantly less than those for Complexity. The latter could be explained by reasons provided immediately prior to Section 1a of the Analysis (the opening paragraphs for Complexity), while the former could be explained by one or more of the following: 1) Inclusivity has approximately double the amount of codes to apply (perhaps because there are seemingly more unique items/groups for a document to include versus unique pairs of items/groups with an interdependent relationship to mention) and 2) it is perhaps easier to apply a code based on the criteria of inclusivity versus interdependence, as something being included may be as simple as that thing being mentioned directly or directly at any time while an interdependent relationship between two things arguably requires a certain degree of clarity or description to reasonably believe such a relationship is being mentioned/suggested at all. Overall, Inclusivity codes were applied well, though this does not necessarily mean that the documents adequately expressed inclusivity in a manner and/or extent that aligns completely with ESL.

a. Inclusivity Code: Greater Timescales

As an aspect of inclusivity in ESL, the inclusion of greater timescales (in general but particularly in decision making) is necessary to ensure the planning, implementing and outcomes of an action reflect long-term rather than just short-term circumstances so that 1) any benefits can be experienced over a greater and more productive time span, 2) any costs/impacts can be avoided/mitigated over a greater and more productive time span and 3) in general, actions and their outcomes are more likely to be sustainable as they considered a more complex and inclusive array of inputs, outputs and scenarios that more accurately reflects the real-world complexity of the Earth system and its relationship with time. There is no precise range or number of years associated with including greater timescales (though perhaps a range or number should be provided to fit a circumstance and ensure the potential for sustainable outcomes for all parties is maximized for that scenario), but generally it looks like surpassing both the present day and the next few years (such as the time period associated with a typical democratic election cycle), as this is already a time frame humans commonly operate within regarding planning and decision making (one that is problematic for fostering more sustainable outcomes according to ESL). With this, showing support for ESL through the inclusion of greater timescales within a SARA document looks like incorporating greater timescales into a species' assessment and/or the design, implementation and outcomes of conservation efforts in a manner that displays clear and impactful consideration for time periods beyond the next few years (from what was considered present day according to the text).

As a code, Greater Timescales was the fourth-most applied of all Inclusivity codes and was applied at least once across each document, though four documents each applied it fewer

than five times. Woodland Caribou accounted for nearly a quarter of all its applications, and the RS+APs in general applied it the most of all document types (collectively accounting for nearly 60% of all applications of Greater Timescales). Based on this analysis, it is encouraging from an ESL perspective to see the code was applied to a fair degree as it suggests there was some productive inclusivity of greater timescales, but it's also potentially concerning to see it applied so inconsistently across all documents as the inclusivity of greater timescales should not be reserved for particular species or types of SARA documents.

The ways in which the documents expressed Greater Timescales revealed fifteen distinct themes. Key themes include: (1) Long-Term Objectives/Planning/Monitoring/Evaluation, (2) Long-Term Viability, (3) Future Activities or Threats, (4) Species' Lifetime, Time to Mature, etc. and (5) Multiple Generations. Key theme (1) is the dominant theme with a contribution percentage of 36%. Ultimately, Greater Timescales was often applied in a manner that displays moderate support for ESL, but this support is limited by the vagueness associated with most greater timescales mentioned, and the incorporation of greater timescales into present and future conservation planning, execution and outcomes specifically could have been enhanced, as many mentions of greater timescales had to do with more surface-level rather than productively disruptive (from an ESL perspective) avenues such as simply stating things that happened in the past or stating biological facts about a species' evolution or lifespan. With this, Greater Timescales provides an example where ESL was supported but could have been supported to a greater extent, largely by adjusting how greater timescales are explicitly discussed. Key themes (1) and (2) referenced greater timescales with regards to conservation objectives, conservation planning and the ability for species to survive, showing support for ESL

not only through the literal mention of greater timescales but especially through the meaningful incorporation of such timescales into the philosophy, planning and implementation of conservation efforts that show promise in their ability to realize more sustainable outcomes through the consideration of greater time periods than just the next few years. In particular, clearly acknowledging the value of a species' long-term viability as a guiding framework or principle for conservation efforts is crucial from an ESL perspective as it shows a certain level of care for a non-human species as well as understanding regarding the Earth system and its relationship with time, and such acknowledgements represented 20% of Greater Timescales' applications. However, a significant number of the expressions of key themes (1) and (2) only used the phrase "long-term" to refer to greater timescales instead of describing a clear range or exact number of years to better define the time period being considered, which presents the risks that 1) those following through with the consideration of greater timescales as well as those evaluating its outcomes will do so with different time periods in mind and 2) the time period being considered fails to maximize the potential for fostering more sustainable outcomes through its consideration due to certain specific considerations associated with a more defined (but still long-term/futuristic) time period being excluded. With this, one could argue the documents' support for ESL could be enhanced further through the mention of greater timescales being more specific on a consistent basis. Also, the expressions of key themes (1) and (2) (and all other key themes as well), while seen at least once in 15 and 12 documents respectively, were mostly assigned to a select few documents (the RS+APs in particular), leaving many documents with very few expressions that have been described as generally supportive of ESL. Thus, the documents could collectively enhance their support for

ESL further by ensuring productive mentions of greater timescales are utilized more often in the majority of documents so that the positive outcomes of considering greater timescales (from an ESL perspective) are experienced for all species rather than a select few. Regarding expressions of key theme (3), they mostly involve mentioning future activities or threats capable of negatively impacting one or more species down the road (seemingly beyond the next few years) and thus generally display support for ESL through the consideration of greater timescales, though often times it is not stated what is specifically meant by "future" as a time period and sometimes it is not clear what singular or list of specific activities/threats is being considered, which leaves space for certain harmful activities/threats to be excluded from consideration. As well, there are times where a specific activity/threat is considered in the context of greater timescales but the information is ultimately not incorporated into current conservation planning, reducing the consideration of greater timescales in some instances to something resembling a simple warning that has little potential for fostering more sustainable outcomes. With this, there are significant opportunities for expressions of key theme (3) to better support ESL. Expressions of key themes (4) and (5) showed considerable support for ESL through the productive consideration of greater timescales in the form of species-specific information (outlining how non-human species and their well-being operate on greater timescales beyond just the next few years and thus so should conservation efforts) and the explicit mention of multiple/future generations of a species (outlining how the well-being of numerous generations of a species needs to be considered in conservation planning), however such support for ESL is ultimately limited by both key themes only being applied to 6 and 11

documents respectively, being applied very few times in general, and being applied only once in the majority of documents that saw applications of either theme.

Overall, Greater Timescales was applied relatively often but highly inconsistently across all documents (with most applications assigned to RS+APs). Thematically, Greater Timescales was applied in a wide variety of ways that collectively showed moderate support for ESL in most instances. Specifically, there were many explicit mentions of greater timescales and many instances where such timescales were considered intentionally for the purposes of enhancing the potential for sustainable outcomes in wildlife conservation (most commonly by discussing long-term conservation objectives/planning, long-term conservation actions and the long-term viability of species as crucial elements of successful wildlife conservation). However, there was a common lack of specificity regarding greater timescales that could be a barrier to fostering sustainable outcomes, numerous mentions of greater timescales that were surface-level and not impactful regarding fostering sustainable outcomes through more thoughtful conservation efforts and a very limited number of productive mentions of greater timescales in most documents (respectively and in general). Thus, Greater Timescales as a code outlines a moderate degree of support for ESL by SARA (in general but mostly through select documents over others) but also presents numerous clear pathways for SARA to better support ESL both in how and how often it considers greater timescales.

b. Inclusivity Code: Future Humans

As an aspect of inclusivity in ESL, the consideration of future humans (the well-being of both those currently alive and presumed to be alive later and those not yet born) in both decision-making and legal systems more generally is necessary to ensure any present-day

planning and/or actions are capable of fostering good outcomes (maximizing the potential benefits while minimizing the potential costs/impacts) for humans beyond just those who are alive today and experiencing life as it is for them today. Undoubtedly, many things about humans change with time including the number of humans alive, which specific humans are alive and the well-being/status of each human at a specific point in time, and so it is key to consider future humans and thus the relationship between humans and time to foster beneficial outcomes for humans before, during and after such changes are experienced. With this, supporting ESL in this context looks like explicitly mentioning future humans and considering their well-being in a manner/extent that appears reasonably capable of promoting/ensuring beneficial outcomes for such humans at that future point in time.

As a code, Future Humans was applied the least of all Inclusivity codes. In fact, it was only applied seven times across just four documents, strongly suggesting a misalignment with/contradiction to ESL from a severe lack of consideration for future humans. One could suggest such low application counts may be explained at least in part by the types of documents being analyzed, given that they focus on non-human species for the purposes of wildlife conservation, however Present-Day Humans was the second-most applied Inclusivity code while Future Non-Humans was the second-least applied, implying that Future Humans' low application count likely has more to do with its association with the future than its association with humans.

The ways in which the documents expressed Future Humans revealed four distinct themes, which will all be considered key themes here given how few applications there were in general. The key themes are: (1) Preserving Nature & Its Benefits for Future Generations, (2)

Secure Species for Future Generations, (3) Being Good Stewards for Future Generations and (4) Future Economic & Natural Wealth. Key theme (1) was a sort of dominant theme with a contribution percentage of 43% (it was expressed three times instead of twice or once like the other themes). Aside from the fact that Future Humans was rarely expressed in any capacity, the way in which this code was applied generally displayed some support for ESL in how future humans were explicitly mentioned and the well-being of future humans was discussed and valued (to a degree) as part of present-day conservation efforts, perhaps showing some capability in promoting/ensuring beneficial outcomes for future humans through decisions made today. However, the degree to which future humans were valued in today's conservation efforts was seemingly low (and so the ability for such considerations of future humans to effectively promote/ensure beneficial outcomes for such humans in the future is perceived as low) because most, if not all, observed considerations for future humans were arguably too brief and too general. Every expression of Future Humans involved very few words and oftentimes the mention of future humans was tacked on to a sentence speaking to present-day humans or a general list of human-specific benefits from wildlife, essentially reducing the consideration of future humans to an afterthought instead of a topic worthy of being discussed more comprehensively. As well, the reason for considering future humans including what specific benefits they stand to gain from wildlife conservation was rarely described, and instead most mentions of future humans simply state that such humans will benefit from nature in general. With this, the extent to which Future Humans displayed support for ESL (in terms of how the code was applied and not how often) was limited. Key theme (1) supports this finding with three expressions that each explicitly mention future humans and speak to the importance

of ensuring these humans are able to access nature's benefits, but each expression is very general and brief and two of the three expressions are actually speaking to how present-day humans are benefitted by simply knowing future generations will be able to access nature's benefits, ultimately tying the value of considering future humans more towards present-day humans than future humans themselves. Key themes (2), (3) and (4) have expressions that similarly show limited support for ESL, although key theme (2) specifically refers to wildlife harvesting benefits for future humans while key theme (4) specifically refers to economic wildlife benefits for future humans.

Overall, Future Humans was rarely applied and was only applied in four documents, though the way it was applied displayed some degree of support for ESL in that considering/including future humans was deemed important in select instances and was seemingly done to promote beneficial outcomes for future humans to some extent. However, instances where future humans were included were always brief, rarely specific and could generally be considered as after thoughts of lesser importance compared to the inclusion of present-day humans. With this and the incredibly low count of applications, Future Humans displayed more of a misalignment with ESL than support, which could be addressed by including future humans more often in general and more consistently across documents as well as by ensuring any inclusion of future humans is comprehensive and focused enough to be genuinely capable of promoting/ensuring beneficial outcomes for such humans at that future point in time.

c. Inclusivity Code: Future Non-Humans

As an aspect of inclusivity in ESL, the consideration of future non-humans (the well-being of both those currently alive and presumed to be alive later and those not yet born) in both decision-making and legal systems more generally is necessary to ensure any present-day planning and/or actions are capable of fostering good outcomes (maximizing the potential benefits while minimizing the potential costs/impacts) for non-human species beyond just those who are alive today and experiencing life as it is for them today. As with humans, many things about other living beings change with time including the number of individuals alive (within a population, species, or group of species), which specific individuals/populations/species are alive and the well-being/status of each one (including how they are interacting with the Earth system) at a specific point in time, and so it is key to consider future non-humans and thus the relationship between non-humans and time (with and without the involvement of humans) to foster beneficial outcomes for non-humans before, during and after such changes are experienced. With this, supporting ESL in this context looks like explicitly mentioning future non-humans and considering their well-being in a manner/extent that appears reasonably capable of promoting/ensuring beneficial outcomes for such beings at that future point in time.

As a code, Future Non-Humans was applied the second-least of all Inclusivity codes. Four documents failed to apply the code at all while eight other documents applied it five times or fewer, allowing for just two documents (Woodland Caribou and Blanding's Turtle, both RS+APs) to account for over half of the 95 total applications. This analysis strongly suggests a misalignment with/contradiction to ESL from a severe lack of consideration for future non-humans (in general and in terms of consistency across all documents). Given this outcome and

that already described for Future Humans, it is reasonable to state generally that SARA does little to consider the well-being of any future living thing (favoring the well-being of present-day living things instead).

The ways in which the documents expressed Future Non-Humans revealed seven distinct themes. Key themes include: (1) Long-Term Persistence - General, (2) Future Harm, (3) Long-Term Monitoring or Modelling for Viability & Changes and (4) Future Habitat Conditions. Key theme (1) was the dominant theme with a contribution percentage of 36%. Aside from the fact that Future Non-Humans was rarely expressed in any capacity across most documents, the ways in which this code was applied generally displayed support for ESL in how future non-humans were mentioned and their well-being was discussed as valuable to both the philosophy/overarching goals of a species' conservation and the tangible way a species' conservation is planned and executed (from its status assessment to the actions taken by humans to directly/indirectly protect the species). Further, these instances where future non-humans were included in the conservation process appeared reasonably capable of promoting/ensuring beneficial outcomes for such beings (at that future point in time) because they seemed to deeply embed the well-being of future non-humans into all aspects of the conservation process for a select species or group of species (from vision to plans, plans to action and action to evaluation) to the extent that only considering present-day non-humans would be unfathomable/unproductive. However, one could argue this support for ESL could have been enhanced further by 1) being more specific about the future time period being mentioned (and thus being more explicit/direct when discussing future non-humans as distinctive from present-day non-humans) and 2) by ensuring the future-non humans of all

species are equally mentioned and treated as valuable, regardless of the species' life-span or apparent significance to humans. Regarding the first item, the majority of Future Non-Humans' applications simply used "long-term" or "future" to describe the time period where future non-humans' well-being is relevant (as opposed to providing a set number or range of years), which can limit one's ability to set concrete goals and timelines for conservation plans/actions that can be evaluated (and renewed or adjusted, if applicable) at a particular point in time and are subsequently capable of achieving some measurable progress or having some measurable impact that productively (with both genuine intention and pathways for accountability) serves the overarching purpose of conservation. In other words, failing to be specific about the time period for a scenario involving future non-humans can limit the ability for those non-humans to be meaningfully conserved/protected/supported. Regarding the second item, most applications of Future Non-Humans applied to species with evidently long life-spans (where considering the well-being of individuals in the future arguably doesn't require much if any additional effort but is more easily incorporated into their conservation planning) such as species of turtles, or to species with clearly significant connections to/relationships with humans such as the woodland caribou (which are described numerous times as being significant to the culture and harvesting needs of Indigenous peoples in Canada). To maximize one's support for ESL through the inclusion/consideration of future non-humans and their well-being, one must commit to this inclusion/consideration with the same rigor, no matter the species in question. Key theme (1)'s expressions displayed strong support for ESL by mentioning a species' long-term persistence as a valuable and necessary part of conservation, particularly in terms of the overarching philosophies of/goals for a species' conservation which is undoubtedly key to fostering more

sustainable outcomes for that species. Key theme (2)'s expressions supported ESL by considering specific things that could negatively impact the well-being of future non-humans to benefit both present-day conservation planning and future non-humans' well-being, though multiple expressions suggested that such things are deemed less severe/less of a concern due to them occurring in the future but not presently, which misaligns with ESL/weakens this key theme's overall support for ESL. Key theme (3)'s expressions support ESL by discussing specific conservation actions (in the form of monitoring and/or modeling) that involve and support future non-humans, though these actions on their own cannot directly influence the well-being of any species/individuals in question. Finally, key theme (4)'s expression support ESL by considering future conditions of a species' habitat that may be worse, better or just different than the present-day (namely through climate change for any given scenario), though it is not always clear how this consideration will impact conservation plans/actions to enhance outcomes for future non-humans which limits this key theme's overall support for ESL. Notably, all four key themes could have further enhanced their support for ESL through the two items discussed above.

Overall, Future Non-Humans was rarely applied and only saw significant application numbers in two documents – documents for species that either have extraordinarily long life-spans (around 80 years long) or extraordinarily significant connections to humans. Thematically, though, Future Non-Humans was generally expressed in a manner that displayed strong support for ESL by not only mentioning future non-humans, but by deeply incorporating their well-being into all matters/layers of wildlife conservation. This support for ESL could have been enhanced further by being more specific with time periods relevant to future non-humans and

by showing productive consideration for future beings of all kinds of species equally, but the way Future Non-Humans was expressed is arguably still more of a positive sign than a negative one from an ESL perspective. This leaves us with the problem of quantity rather than quality for this code, as future non-humans were ultimately not included enough across SARA to fully support ESL, which can be improved upon by applying Future Non-Humans as it has already been applied (namely in Blanding's Turtle and Woodland Caribou) across every SARA document consistently.

Speaking to biocentric and ecocentric perspectives, the thematic analysis of Future Non-Humans revealed only weak support for these perspectives in that the well-being of living things (and their ecosystems more indirectly), specifically those who will be existing in some years beyond the present-day, was mentioned and deemed valuable, but the majority of the language used to discuss these beings (and their ecosystems) was purely technical/scientific. With this, the value of their well-being (within the scope of Future Non-Humans applications) was arguably less (if at all) tied to the fact that those living beings/ecosystems exist and are therefore inherently valuable, and more (if not entirely) tied to the fact that they are a part of a species and that species' ability to exist/thrive through time (in the present and future; sustainably) and are therefore valuable from a purely logical/reasoned standpoint. In other words, it is reasonable to conclude that any inclusion of future non-humans had seemingly little to do with their value as living beings and nearly everything to do with their logical connection to the conservation of their designated species. To better support biocentric and ecocentric perspectives, any inclusions of future non-humans should go beyond purely technical language to describe their well-being to better acknowledge/consider their value as living individuals.

d. Inclusivity Code: Geographic Areas

As an aspect of inclusivity in ESL, the inclusion of geographic areas (beyond those that are seemingly most relevant in a particular circumstance/context, such as the recognized area of Canada for a Canadian conservation document, and that instead span across the entire Earth system) in both decision-making and legal systems more generally is necessary to 1) properly recognize that all geographic areas on Earth are connected within a larger, complex system and can therefore impact and be impacted by one another through countless pathways, including by harming or protecting a species/population of a species regardless of where that species/population resides, and 2) ensure that potential benefits are maximized while potential costs/impacts are minimized for all geographic areas on Earth from any plan made or action taken in a single geographic area, allowing for more sustainable outcomes to be fostered for all parties. With this, showing support for ESL through the inclusion of geographic areas within a SARA document looks like mentioning geographic areas outside the recognized borders of Canada and having those areas participate/be considered in the planning and implementation processes for wildlife conservation such that any conservation outcomes are enhanced for the benefit of a species and all geographic areas. Importantly, to support ESL by including geographic areas in a particular instance or in general, one does not need to mention every geographic area on Earth, although they should mention the entire Earth system as a larger geographic area connecting every smaller one or at least acknowledge the concept that different, smaller geographic areas are united/systematically connected (despite any borders/differences drawn by humans) and this unity is key to solving sustainability issues including the biodiversity crisis and maximizing positive outcomes for all parties.

As a code, Geographic Areas was applied the fourth-least of all Inclusivity codes. Half of the sixteen documents either didn't apply this code or applied it five or fewer times (including all MSAPs), while just two of the eight remaining documents (Monarch and Leatherback Turtle) accounted for over 50% of the 197 total applications. With this, Geographic Areas was applied to a relatively small degree and very inconsistently across all documents. It is unsurprising that over half of the code's total applications are centered on two species known to travel and live beyond the borders of Canada while few to no applications were seen in MSAPs that inherently focus entirely on specific geographic areas (national parks) within Canada's borders. However, both the low total application count and the low counts for many of the documents, regardless of how obvious their respective connections are to geographic areas beyond Canada, suggest an overall misalignment with ESL due to an insufficient degree of consideration for geographic areas in SARA.

The ways in which the documents expressed Geographic Areas revealed eight distinct themes. Key themes include: (1) Other Countries or Continents, (2) Worldwide, (3) Range of International Species, (4) Oceans and (5) Outside Canada. Key theme (1) is the clear dominant theme with a contribution percentage of 73%, outlining how most mentions of geographic areas besides Canada focused on the national/continental scales which are based on human-designed borderlines that arguably mostly serve to define our differences (as humans) rather than unite us under one system. Generally, the ways Geographic Areas was applied displayed only limited/weak support for ESL and ultimately showed more of a misalignment with ESL in that geographic areas besides Canada were mentioned numerous times and their inclusion was sometimes used as part of conservation planning/implementation to foster better outcomes for

a species and occasionally the geographic area(s) as well (namely if a species happens to also live in that area besides Canada for parts of a year or in general), but most instances of including these geographic areas failed to 1) effectively/thoroughly unite geographic areas (as areas part of a bigger system who are capable of impacting and being impacted by one another through conservation efforts or a lack thereof) and 2) give full confidence that said inclusion will enhance outcomes for all species and geographic areas mentioned. Expressions of key theme (1), representing the majority of applications for this code, included a variety of geographic areas according to their human-based/recognized country name or, to a lesser degree, continent name. Oftentimes, these expressions were simply stating facts such as which country or continent a species can be found in or what conservation effort was made historically in/by another country, which does not equate to including a geographic area in an ESL-supportive fashion. When an expression successfully 1) mentioned and united different countries or an entire continent because the threats to and conservation of a particular species (namely the Monarch or Leatherback Turtle) inherently involves all those areas and/or 2) clearly included different geographic areas for the purposes of working together to enhance outcomes for a species and even the geographic areas themselves, the uniting of geographic areas was seemingly too surface level to truly support ESL (in that it was done largely or purely because it is simply logical to collaborate on conservation efforts outside one's own national borders so that benefits are received/outcomes are enhanced, for themselves and the species in question, within their own geographic area as opposed to in general across the Earth system) and often overly general (such as by saying Canada will work with other nations to plan and execute conservation efforts without describing how or when, thus making it unclear if an inclusion of

other geographic areas is genuinely productive/ESL-supportive), and the expression generally appeared to lack the transformative nature/intention required for positive change from an ESL perspective (by seemingly supporting or perpetuating the idea that geographic areas remain distinct from one another and will predominantly make decisions based on this). An example that aligns with this evaluation is an expression of key theme (1) found in the Leatherback Turtle RS+AP where the benefits of implementing the RS+AP are described. Here, the focus is solely on how Canadians will benefit both within and beyond the borders of Canada from the species' recovery, with no words devoted to how other geographic areas and their citizens will benefit or how the involvement/uniting of other geographic areas is key to any received benefits. Expressions from all other key themes generally support the same evaluation, though geographic areas are characterized in ways besides country or continent names. Key theme (2)'s expressions are significant in that they characterize geographic areas as the entire world, but relatively few expressions displayed genuine support for ESL as they were often centered around stating a fact such as how certain threats for a species occur worldwide.

Overall, Geographic Areas was applied only moderately and mostly across a select few documents. Applications of this code were biased towards documents for species with significant and well-known relationships to geographic areas besides Canada, which could be argued as reasonable, however, to truly support ESL, the productive inclusion of geographic areas is arguably necessary regardless of the circumstance/species in question. Thematically, Geographic Areas' applications did more to misalign with than support ESL as geographic areas were generally not included/considered in a manner that acknowledges the unity of these areas under one Earth system and uses this unity to intentionally enhance outcomes for all parties

across the world. To better support ESL, it is recommended that SARA does more to include geographic areas besides Canada across all documents (perhaps not evenly amongst documents, but so that no document has few to no applications at all) and to ensure any inclusion of these areas is genuinely rooted in the goal of connecting different geographic areas under a larger system and meaningfully incorporating their well-being and capabilities in conservation plans/actions to enhance the outcomes for all parties (geographic areas and both the non-human species and humans living there).

e. Inclusivity Code: Normative Inclusivity

As an aspect of inclusivity in ESL, including the perspectives of governments/government employees who are normally already in charge of decision-making and legal systems (generally speaking) is essential to fostering more sustainable outcomes in that governments and those representing them are arguably meant to exist to provide order/structure and enhance the outcomes for both those in human societies and the natural environment (including non-human species) that human societies impact and are impacted by (involving methods/extents that could perhaps not be utilized/achieved by other individual or groups of humans), and so their continued inclusion/support can have a positive impact on attempts to foster more sustainable outcomes (so long as the government/government representatives in question are committed to the purpose outlined above, both in thought and action). Also included in Normative Inclusivity is the consideration of short-term timescales that already dominate current decision-making and legal systems (generally speaking), and their continued inclusion/consideration is essential to enhance outcomes for the present-day and very near future. However, the inclusion of governments, their employees and short-term

timescales are insufficient for fostering more sustainable outcomes on their own as it leaves significant space for outcomes to not be enhanced/sustainable for all parties of the Earth system in the short and long term, as one cannot reasonably expect 1) the perspectives of a relatively small number of humans to effectively consider all elements of the Earth system and those living within it for every decision/circumstance or 2) the consideration of only short-term timescales to result in beneficial/sustainable outcomes in the long term in every instance. With this, not only should governments, their representatives and short-term timescales be considered as just two of many categories of living beings/circumstances to include, but their inclusion should also not inherently carry more significance for decision making and legal systems than that of others, whether these others speak to humans or non-human species in the present or future, or greater timescales. Thus, to support ESL (in the context of SARA and arguably in general), the inclusion of governments/government employees and short-term timescales should be present but should not cast a shadow over the inclusion of other categories of living beings such that their inclusion is far greater in number of instances and/or is seemingly deemed more significant for any matters at hand (to do with decision making and legal systems).

As a code, Normative Inclusivity was the third-most applied Inclusivity code and was applied at least five times in every document. Its applications were favored by the SARA legislative document and the Woodland Caribou RS+AP, together accounting for nearly half of all of the code's applications, while the Mgmt. Plans saw the least total applications of any document type. Its relatively large total number of applications and the fact that all documents applied it are both expected outcomes given that the documents were authored by

government employees and the responsibility (from a legal perspective) for wildlife conservation in Canada falls on its government bodies. As well, it is encouraging from an ESL perspective that application counts for both Present-Day Humans and Present-Day Non-Humans saw greater totals (respectively) than that for Normative Inclusivity and greater numbers (respectively) for almost every document compared to those for Normative Inclusivity. Altogether, this suggests that governments/government employees and short-term timescales were included to a relatively large degree but their inclusion seemingly did not overshadow that of all other categories of living beings/circumstances in terms of the number of instances of inclusion, which supports ESL. However, the inclusion of geographic areas, greater timescales, future humans and future non-humans, in total and for each document, generally pale in comparison to that of governments/government employees and short-term timescales according to the same metric, which misaligns with ESL.

The ways in which the documents expressed Normative Inclusivity revealed nine distinct themes. Key themes include: (1) Federal Gov't in Command or Making Commitments; COSEWIC, Enforcement Officers & Her Majesty, (2) Other Gov'ts Contributing or In Command or Making Commitments, (3) Ministers & Governors Contributing or In Command, (4) Federal Land, (5) Provincial Land/Rights and (6) Short-Term Efforts (Monitoring, Research, One-Time Plan Development, etc.). Key theme (1) was the dominant theme with a contribution percentage of 70%, outlining how Canada’s federal government and its affiliates were included more than any other government, any particular government employee or short-term timescales under the umbrella of Normative Inclusivity, which is reasonable given the analyzed documents and SARA as a whole is authored by and placed under the leadership of the federal

government. Generally, the ways Normative Inclusivity was applied displayed moderate support for ESL in that the inclusion of governments, their employees and short-term timescales was often perceived as productive regarding the ability for their inclusion to truly enhance outcomes for wildlife as well as various human groups, and their inclusion often involved some degree of collaboration with those outside of Normative Inclusivity's umbrella, suggesting the significance of their own inclusion was not deemed greater than that of others in many instances. In select cases, governments/government employees were solely or primarily included for the purposes of facilitating/promoting the inclusion of others, using the unique powers/abilities granted to them. Similarly for short-term timescales in select cases, its inclusion was solely or primarily for the purposes of enhancing long-term outcomes (such as by pursuing short-term research or monitoring to better execute long-term conservation efforts). However, the ways Normative Inclusivity was applied also outlined misalignments with ESL at times, including instances where 1) governments, their employees and/or short-term timescales were the only things included regarding a particular conservation matter, making it unlikely that the particular outcomes will sustainably benefit all parties in the Earth system, 2) governments/government employees were seemingly framed as the sole or primary facilitator regarding the inclusion of other groups, presenting the risk that certain governments/government employees could provide poor facilitation in terms of quantity and/or quality and directly limit both others' participation and the potential for fostering more sustainable outcomes, or 3) the inclusion of governments, their employees or short-term timescales is deemed so significant/impactful that their biases or gaps in capabilities could or likely will prove harmful for wildlife and/or various human groups. With this, any support for

ESL from how Normative Inclusivity was applied could have been enhanced further. Expressions of key themes (1), (2) and (3) align well with the above evaluation, respectively including Canada's federal government, smaller scales of government and powerful government representatives in a manner that generally showed moderate support for ESL in ways described above but also misalignments at times. For key theme (1) in particular, the inclusion of the federal government was granted considerable significance in matters of conservation science and the coordination of conservation efforts, which is simultaneously understandable (given their current status as both the primary authors of SARA documents and those legally responsible in Canada for national and international commitments to protecting biodiversity) and problematic (given their unmatched level of influence over both the outcomes for species at risk and the inclusion/participation of other groups in conservation efforts, which is inherently problematic for fostering more sustainable outcomes but can also get worse depending on the particular people/ideologies ruling the federal government at any given time). Ultimately, key theme (1)'s expressions showed notable support for ESL in how many instances of including the federal government were seemingly productive for wildlife and the Earth system from an ESL perspective, though there is considerable room for such support for ESL to be enhanced/more consistent. Key theme (3)'s expressions were unique in that any misalignments with ESL generally had to do with a single government employee's inclusion being granted far too much significance/impact, such that they appear free to make arbitrary or biased decisions that could maintain or worsen outcomes instead of fostering more sustainable outcomes for all parties. Expressions of key themes (4) and (5) respectively include Canada's federal and provincial/territorial governments in terms of their distinct ownership of lands

across Canada, which can be argued as sensible and accurate given current laws and perceptions regarding land ownership and responsibilities for different owners or non-owners of land in Canada, though for the purposes of wildlife conservation from an ESL perspective these expressions arguably display misalignments with rather than support for ESL in that maintaining the notion that governments control nearly 90% of Canadian lands presents significant risks for the inclusion/participation of other groups in conservation efforts and the fostering of more sustainable outcomes for all parties in the Earth system. Finally, expressions of key theme (6) focus on including short-term timescales, which was generally unavoidable and even productive for wildlife conservation from an ESL perspective (as described previously), though the significance of its inclusion could have been more balanced with that of greater timescales to ensure outcomes are truly beneficial for all parties in the long term.

Overall, Normative Inclusivity was applied fairly often and consistently, and its total application counts (in general and for each document) suggests the inclusion of governments, their employees and short-term timescales is matched or lesser than that of present-day humans and present-day non-humans (which offers support for ESL) but greater than that of geographic areas, greater timescales and future living beings (which presents a misalignment with ESL). These results are somewhat expected given the unavoidable inclusion of governments, their employees and short-term timescales in government-authored documents designed for a country whose governments carry legal responsibility for biodiversity protection and who must make short-term plans/actions to contribute to positive outcomes. These results also align with the seemingly poor inclusion of geographic areas, greater timescales and future living beings that has already been discussed for this study. Thematically, expressions of

Normative Inclusivity generally display some support for ESL but also outline multiple instances where ESL was contradicted, particularly in how the inclusion of governments, their employees and/or short-term timescales are sometimes granted too much significance relative to the inclusion of other living beings/circumstances to give one confidence that more sustainable outcomes (and more democratic/inclusive decision-making) will be fostered. To better support ESL, the documents must ensure any inclusion of governments, their employees and short-term timescales is reasonable in how such inclusion is portrayed/perceived/granted influence relative to that of other groups.

f. Inclusivity Code: Present-Day Humans

As an aspect of inclusivity in ESL, the consideration of present-day humans (the well-being of those currently alive as they are now) in both decision-making and legal systems more generally is necessary to ensure any present-day planning and/or actions are capable of fostering good outcomes (maximizing the potential benefits while minimizing the potential costs/impacts) for all humans who are alive and experiencing life as it is for them today as well as all other parties in the Earth system in the present and future (since a greater diversity of perspectives arguably makes it more likely that outcomes will be beneficial/sustainable for a wider range of participants in the Earth system). Importantly, this means considering and ensuring beneficial outcomes for not just the public (citizens/non-government employees/human societies as a whole) but every individual of every category of human (according to race, sexual orientation, socioeconomic status, etc.) so that every present-day human, accounting for their uniquely experienced vulnerabilities/disadvantages in present-day human societies, is valued equally in both thought and action. With this, supporting ESL in the

context of this study looks like explicitly mentioning present-day humans (ideally both the collective and individuals, particularly those experiencing societal inequities) and considering their well-being in a manner/extent that appears reasonably capable of promoting/ensuring beneficial outcomes for such humans as well as other parties in the Earth system.

As a code, Present-Day Humans was applied the second-most of all Inclusivity codes and was applied at least three times in every document. The SARA legislative document, Woodland Caribou RS+AP and La Mauricie NP MS+AP collectively accounted for nearly half of the code's 610 total applications, and the Mgmt. Plans saw the least number of applications of all document types. Altogether, this suggests that present-day humans saw a high degree of inclusion in SARA, potentially showing support for ESL, though select documents perhaps included these humans too infrequently to support ESL in this manner.

The ways in which the documents expressed Present-Day Humans revealed six distinct themes. Key themes include: (1) Considering Input/Participation From Experts, ENGOs, Landowners, etc. (Stakeholders More Generally), (2) Considering Input/Participation From the Public, (3) Socio-economic Considerations & Benefits to Society, (4) Considering Input/Participation From Indigenous and (5) Considering Priorities/Constraints of Participants. Key theme (1) was the most dominant theme with a contribution percentage of 46%, outlining how present-day humans were most commonly included when characterized as stakeholders with an apparent interest in the conservation matter at hand. Generally, the ways in which Present-Day Humans was applied displayed some degree of support for ESL in that present-day humans were explicitly mentioned and their well-being was, in many instances, considered in a manner that 1) makes it known that wildlife conservation cannot happen or be successful

without their input/participation, and 2) appears potentially capable of promoting/ensuring beneficial outcomes for such humans as well as other parties in the Earth system. However, this support for ESL is limited due to 1) not explicitly mentioning a wide range of vulnerable categories of humans and instead focusing mostly on present-day humans as a collective as well as stakeholders deemed (largely by government/government employees, presumably) to be most relevant to a certain conservation matter, 2) not acknowledging/discussing the barriers and obstacles experienced by various (but particularly the most vulnerable) categories of humans and ultimately not accounting for these circumstances to promote their equitable inclusion and the enhanced outcomes that result from such, 3) at times being overly general regarding the inclusion of present-day humans, making one reasonably question the degree of quality or impact from said inclusion, 4) an abundance of control over the inclusion of present-day humans being granted to governments/government employees without apparent measures to hold those in control accountable for the actual quantity and quality of inclusion that will occur, 5) housing the greatest quantity and quality of present-day human inclusion primarily in SARA documents for species/areas that have a more apparent connection to particular categories of present-day humans (Woodland Caribou and their significant and well-known connection to Indigenous peoples, for example), rather than displaying such impactful inclusion to at least a moderate degree in all documents, and 6) many instances where the quality of inclusion does not appear reasonably capable of promoting/ensuring beneficial outcomes for present-day humans as well as other parties in the Earth system, often involving one-sided arrangements that focus on simply informing present-day humans or exploring conversations/possibilities without committing to meaningfully including their input.

Altogether, these items represent misalignments with ESL that do not necessarily extinguish the support for ESL offered through much of Present-Day Humans' expressions, but certainly limit it. Expressions of key theme (1) show some support for ESL through the inclusion of stakeholders (who are sometimes specified/listed), though this inclusion is at times overly general (such as by stating the importance of and intention to foster partnerships with stakeholders without discussing when/how they will be formed or how they will operate to meaningfully consider the well-being of stakeholders) and questionable regarding the ability for said inclusion to enhance the outcomes for present-day humans and other parties in the Earth system (such as by saying the stakeholders will provide advice on a conservation matter without making it clear that said advice will be meaningfully considered by decision-makers). Expressions of key theme (2) are also supportive of ESL at times, though many instances of including the public are overly general, are limited to one-way communications where the public is simply being informed about something, and do not account for inequities experienced by different categories of humans within the collective public. Key theme (3)'s expressions include present-day humans by discussing their potential and known benefits and costs experienced from conservation efforts, which is a key way to meaningfully include present-day humans in support of ESL, though such inclusion is generally kept to a brief amount of words at the end/appendix of a SARA document and these expressions would arguably carry more significance if they occurred throughout each document to better integrate positive/negative impacts on present-day humans into conservation plans/actions. Expressions of key theme (4) often do well to support ESL by including Indigenous peoples, a vulnerable group in human societies, though the barriers and obstacles they experience are not explicitly discussed or

accounted for which likely negatively impacts their ability to be included (meaningfully and in general), and the well-researched benefits of Indigenous-led conservation are not discussed at length in any document. Finally, expressions of key theme (5) include present-day humans by discussing their priorities and limitations regarding conservation efforts and/or in general, which is another key way to include present-day humans in support of ESL, though these expressions often only spoke to those deemed as stakeholders for a particular conservation matter (rather than all kinds of vulnerable groups in human societies) and generally offered no solutions to any outlined limitations to ensure outcomes are still maximized for all parties in the Earth system.

Overall, Present-Day Humans was applied to a relatively large degree and was applied in every document, though it was prioritized in documents with the most apparent connections to select groups of present-day humans while being applied perhaps too infrequently in most other documents. Thematically, its applications generally showed some support for ESL by declaring the inclusion of present-day humans as immensely valuable, even necessary to wildlife conservation and, in numerous instances, including such humans in a manner that could potentially or even likely enhance the outcomes for these humans, species at risk and the Earth system in general. However, the overall support for ESL through the inclusion of present-day humans was fairly limited through the many instances where their inclusion was overly general, failed to give special attention to a wide range of vulnerable individuals/groups in human societies and promote equitable inclusion by accounting for their uniquely experienced barriers/obstacles, and left space for the quality of inclusion to be diminished, namely by allowing governments/government employees to maintain control (with little apparent

accountability) over the quantity and quality of the inclusion (and conservation decision-making in general). Taking all analyses together, SARA could further enhance its support for ESL by 1) enhancing the quantity of meaningful inclusion of present-day humans across all documents, even those with less apparent connections to said humans, and 2) ensuring the inclusion of present-day humans is more meaningful/productive in every instance such that a) the discussed misalignments with ESL are limited/extinguished and b) their inclusion involves a more structured, democratic process where they have more control over the quantity and quality of their own inclusion (and decision-making in general) while ensuring that the common goal (from an ESL perspective) of fostering more sustainable outcomes for all parties in the Earth system (equally) remains the intention and outcome of the inclusion (accounting for possibilities where certain present-day humans, namely those with priorities that likely compete with instead of support the well-being of wildlife, could be granted an inclusion that ultimately corrupts conservation efforts and worsens outcomes for select parties in the Earth system).

g. Inclusivity Code: Present-Day Non-Humans

As an aspect of inclusivity in ESL, the consideration of present-day non-humans (the well-being of those currently alive as they are now) in both decision-making and legal systems more generally is necessary to ensure any present-day planning and/or actions are capable of fostering good outcomes (maximizing the potential benefits while minimizing the potential costs/impacts) for all non-humans who are alive and experiencing life as it is for them today (since human decisions/legal systems typically focus solely on fostering good outcomes for humans) as well as all other parties in the Earth system in the present and future (since a

greater diversity of perspectives arguably makes it more likely that outcomes will be beneficial/sustainable for a wider range of participants in the Earth system). Importantly, this means considering and ensuring beneficial outcomes for not just the collective (all present-day non-humans viewed as a single entity) but every non-human at the individual, population and species level so that every present-day non-human, accounting for their uniquely experienced vulnerabilities/disadvantages in and outside of present-day human societies, is valued equally in both thought and action. As well, the productive inclusion of present-day non-humans must involve (at least in most instances) considering their inherent/non-human-based valuations to ensure their inclusion will legitimately benefit them and not solely or primarily humans. With this, supporting ESL in the context of this study looks like explicitly mentioning present-day non-humans (ideally both the collective and individuals) and considering their well-being in a manner/extent that appears reasonably capable of promoting/ensuring beneficial outcomes for such beings as well as other parties in the Earth system.

As a code, Present-Day Non-Humans was applied the most of any Inclusivity code and was applied at least 25 times in each document. Regarding document types, it was applied the most in RS+APs (with each RS+AP seeing 70 to 227 applications) and the least in Mgmt. Plans (with each Mgmt. Plan seeing 29 to 76 applications). This code's large count of applications (per document and across all documents combined) might suggest strong support for ESL through a high degree of inclusion of present-day non-humans, though it is reasonable to expect such high counts given that the documents intentionally focus on such beings for conservation purposes and their technical inclusion does not equate to being included in a manner that supports ESL.

The ways in which the documents expressed Present-Day Non-Humans revealed six distinct themes. Key themes include: (1) Considering Their Well-Being, Status & Protection, (2) Considering Their Needs (Habitats) & Unique Features, (3) Considering Their Human-Specific Value, (4) Considering Their Environmental Value and (5) Considering Their Intrinsic Value. Key theme (1) is the dominant theme with a contribution percentage of 79%, outlining how present-day non-humans were most commonly included through discussions of assessing and potentially improving their well-being, which is expected given the nature of the documents. Generally, the ways in which Present-Day Non-Humans was applied displayed some degree of support for ESL in that present-day non-humans were explicitly mentioned and their well-being was, to incredible extents, considered in a manner that 1) makes it known that the current and sustained well-being of present-day non-humans, through active conservation/protection and in general, is genuinely a high priority with thoughtful intentions and legitimate efforts put towards it that appear potentially capable of promoting/ensuring beneficial outcomes for such beings as well as all parties in the Earth system, and 2) showcases a range of valuations of wildlife including those that are not human-centric, offering opportunities for present-day non-humans to be included without (or at least with less) severe human biases corrupting the inclusion process and the outcomes to follow. However, this support for ESL is limited due to 1) seemingly reserving more instances of high-quality/productive inclusion for species deemed more relevant/connected and/or charismatic/interesting to humans, both across and within document types (not simply due to species' different extents of being at-risk), 2) doing little to acknowledge/discuss many of the barriers and obstacles experienced by various non-human species/individuals as a result of the human biases mentioned above and ultimately not

accounting for these circumstances to promote their equitable inclusion and the enhanced outcomes that result from such, 3) at times being overly general regarding the inclusion of present-day non-humans, making one reasonably question the degree of quality or impact from said inclusion (such as statements about mitigating impacts on a species without specifying the degree of mitigation to be achieved or how resolutions will be made with humans committing said impacts such that truly sustainable outcomes are fostered for the species), 4) a lack of apparent measures to hold humans accountable for the actual quantity and quality of inclusion that occurs, and 5) the majority of valuations of wildlife being human-focused and subsequently restricting the potential for more sustainable outcomes to be fostered for non-human beings. Altogether, these items represent misalignments with ESL that do not necessarily extinguish the support for ESL offered through much of Present-Day Non-Humans' expressions, but certainly limit it. Expressions of key theme (1) were generally simplistic/straightforward, speaking to the current status of and protection efforts for species as well as the need to protect them in general, which is expected (in general and in such high numbers) given the nature/intention of the documents and SARA as a whole. Still, these expressions (generally speaking) ultimately showed both genuine care for the well-being of present-day non-humans and commitments to actions to support their well-being, thus displaying support for ESL. However, these expressions also saw numerous examples of the ESL misalignments listed above and so any support for ESL is limited. Expressions of key theme (2) revealed an important/particularly thoughtful level of consideration for the well-being of present-day non-humans through statements regarding a species' or population's unique needs and/or characteristics. Such consideration is crucial for their productive/impactful inclusion as it acknowledges the unique qualities of different kinds

of non-humans, arguably enhancing a) one's connection with/valuation of that species or population for the benefit of all parties (since understanding the uniqueness of something arguably increases the potential for building/maintaining a positive relationship with that thing) and b) the ability for beneficial/sustainable outcomes to be fostered for that species or population (as decisions/solutions can be tailored to that species' or population's specific circumstances). With this, these expressions display some support for ESL, but this support is limited as with the expressions of key theme (1). Key themes (3), (4) and (5) are worth examining together, as expressions of key themes (4) and (5) reveal significant support for ESL through non-human-based valuations of wildlife (considering their environmental and intrinsic value, respectively) that are capable of promoting truly beneficial outcomes for present-day non-humans (for all kinds of non-humans and in all circumstances, regardless of human biases/interests) through their acknowledgment. However, expressions of key theme (3) focus on human-based valuations of wildlife and are far more present in every document, presenting a misalignment with ESL by suggesting that human-based valuations of wildlife are more prominent, even in documents designed to enhance the care for/protection of non-humans. Further, expressions of key themes (4) and (5) (particularly the latter) were generally limited to one or a couple paragraphs in each document (often near the beginning or end) rather than being embedded throughout each document, ultimately limiting the impact from acknowledging these non-human-based valuations of wildlife and allowing one to reasonably question the sincerity of their mentions.

Overall, Present-Day Non-Humans was amply applied in general and in each document relative to other codes, which is expected given the nature of the documents but suggests some

support of ESL. Its application was favored in RS+APs, suggesting that conservation plans/actions for species declared more at-risk will see greater overall inclusion of present-day non-humans (which could be argued as reasonable, though it remains important to include these beings to a large degree regardless of the species being discussed to truly support ESL). As well, the code's application was seemingly favored when speaking to species that are deemed more connected/significant and/or charismatic/interesting to humans, suggesting that human bias limited the overall inclusion of present-day non-humans (and thus the overall benefits resulting from such) and subsequently outlining a potential misalignment with ESL. Thematically, the code's applications generally showed some support for ESL by designating the genuine and in-depth consideration/understanding of present-day non-humans' well-being and unique qualities as immensely valuable, even necessary to wildlife conservation and, in numerous instances, including these beings in a manner that could potentially or even likely enhance the outcomes for them and the Earth system in general. However, the overall support for ESL through the inclusion of present-day non-humans was fairly limited through the many instances where their inclusion was overly general, did not address some or all of the inequitable treatment of different non-human species by humans (often failing to grant special attention to species with disadvantages stemming from human biases) and prioritized human-focused valuations of wildlife. Taking all analyses together, SARA could further enhance its support for ESL by 1) enhancing the quantity of meaningful inclusion of present-day non-humans across all documents, even those for species who are seemingly less at risk and/or have less apparent connections/appeal to humans, and 2) ensuring the inclusion of present-day non-humans is more meaningful/productive in every instance such that a) the discussed

misalignments with ESL are limited/extinguished and b) their inclusion is more rooted in non-human-based valuations of wildlife so the intentions and outcomes are more focused on genuinely and effectively enhancing the circumstances/well-being for non-human beings.

Speaking to biocentric and ecocentric perspectives, the thematic analysis of Present-Day Non-Humans revealed moderate support for these perspectives in that non-human beings were explicitly mentioned as being inherently valuable and/or valuable because of what they offer to ecosystems (that are perhaps indirectly suggested as being inherently valuable as well, in some or all of these instances) numerous times overall and at least once in nearly every document. As well, there were many instances where the inherent value of non-human beings/ecosystems was not explicitly stated but their well-being, unique qualities and human-driven protection was still discussed, suggesting some degree of indirect support for biocentric and ecocentric perspectives (as such items being discussed arguably contradicts a complete rejection of these perspectives). However, given the low degree of instances where present-day non-humans were valued inherently or for their environmental contributions, on an absolute basis but especially relative to the more common instances where they were valued according to human benefits, any support for biocentric and ecocentric perspectives from the inclusion of present-day non-humans is limited. Further, much of the language used when including these beings (particularly in expressions of key themes (1) and (2), making up the majority of the code's applications) was an example of purely scientific or legal writing. With this, the value of their well-being (according to many of the code's applications) was arguably less tied to the fact that those living beings/ecosystems are inherently valuable in their existence and should therefore be included in the documents, and more tied to the fact that they resemble a legal obligation

such that the government and other human groups must take action to describe and conserve species or else face consequences within human societies. With this, any support for biocentric and ecocentric perspectives is limited once more. To better support these perspectives, explicit mentions of non-human-based valuations of wildlife should be enhanced (and certainly outnumber instances of human-based valuations) and the inclusion of present-day non-humans should generally go beyond purely technical or legal language to describe their well-being to better acknowledge/consider their value as living individuals.

h. Inclusivity Code: Potential

Potentially rather than clearly/definitively including present-day or future humans or non-humans (in the manners described earlier) is arguably not an aspect of inclusivity in ESL, but instead offers insights regarding displays of inclusivity for ESL through instances where unnamed individuals or groups were directly or indirectly mentioned in a manner that perhaps displayed inclusivity for ESL but didn't state who exactly was being included. By examining these instances, one could outline opportunities to enhance inclusivity for ESL in a given context or document and characterize what potentially versus definitively including someone looks like. Ultimately, the inclusion of someone (or something) only qualifies as being truly supportive of ESL if it is made clear who (or what) is being included, as their identity plays a significant role in indicating whether (and to what degree) the inclusion will support fostering more sustainable outcomes for all parties in the Earth system.

As a code, Potential was applied the third-least of all Inclusivity codes and was applied just once in four documents (and applied five or fewer times in eleven total documents). La Mauricie NP applied this code the most, seeing 29 of the 101 total applications. Importantly,

Potential was a difficult code to apply at first due to its initial definition being overly loose – a potential rather than definitive expression of inclusivity has a large scope and could be too subjective/indefensible for this study (by relying heavily on assumptions made about the text in question). In response to this, the definition was narrowed so that the code was only applied when unnamed individuals or groups were directly or indirectly mentioned and seemingly included, but without any notion of who exactly was being included. This allowed for Potential to be applied relatively easily for the majority of the coding process, which subsequently provided results detailing expressions of inclusivity not assigned to a particular party. Ultimately, the code's low count of applications, in general and across most documents, doesn't suggest any support of or misalignment with ESL.

The ways in which the documents expressed Potential revealed thirteen distinct themes. Key themes include: (1) Partners, (2) Encouraging/Promoting Others to Do Things or Increasing Others' Awareness, (3) Collaboration/Others Contributing to Projects and (4) Technical Committee or Working Group. Key theme (1) was the dominant theme with a contribution percentage of 45%, outlining how the most common form of potential inclusion involved those only referred to as "partners". Generally, the ways in which Potential was applied displayed some level of inclusivity for present-day humans in particular, though it was not clarified in any instance whether such humans are under the umbrella of Normative Inclusivity (humans typically included in decision-making/legal systems), part of a particular and perhaps vulnerable group in human societies apart from an official government, or simply humans in general. In certain instances, one could assume that the general public or a particular stakeholder such as academic experts are being referred to/included, but one could

never be entirely sure. Aside from the unknown identities of the humans being included, the expressions of Potential generally displayed medium-quality examples of inclusivity for ESL in that the instances of inclusion often appeared capable of promoting/ensuring beneficial outcomes for species at risk to some degree, though the connection between their inclusion and wildlife conservation was sometimes overly general (e.g. “help partners protect and restore populations”), arguably limiting the potential for ESL-supportive impact from said inclusion. Altogether, the ways in which Potential was applied (generally speaking) does not display clear support for or misalignments with ESL, but outlines opportunities for ESL to either be supported or contradicted (upon adjusting applications of Potential to clearly define those being included), depending on a) who is being included and whether or not this supports greater equity in decision making/legal systems, and b) the quality of their inclusion regarding its ability to genuinely support the fostering of more sustainable outcomes for all parties in the Earth system. As mentioned, expressions of key theme (1) refer to the unknown humans being included as “partners”, while expressions of key themes (2) and (3) refer to encouraging/educating or collaborating with, respectively, some unknown entity (presumably a specific or general group of humans). Expressions of key theme (4) involve including some kind of technical committee or working group deemed relevant to a particular species/conservation matter, though it is generally not made clear who will be in said committee/group, how they will be selected or how they will participate meaningfully.

Overall, Potential was rarely applied and saw ten or more applications in just four documents. Upon adjusting the code’s definition early into the coding process, it was made easier to apply but this did not result in a large number of total applications. This suggests that

most instances of inclusion in SARA clearly define who is being included and thus limit opportunities for Potential to be applied, which may be a positive sign from an ESL perspective in that unclear examples of inclusion are not made a standard. Thematically, expressions of Potential do not outline any clear support for or contradiction with ESL. Instead, they present opportunities for instances of inclusion to be strengthened by clarifying who is being included, though doing so does not guarantee that support for ESL will be shown through said inclusion as it also depends on why and how someone is being included, not just who. Importantly, an analysis of Potential's expressions in terms of their quality of inclusion (aside from their lack of clarity around who is being included) revealed both varying degrees of support for ESL and misalignments with ESL through different instances of inclusion, which aligns with previously discussed analyses on the quality of inclusivity within the documents.

i. Inclusivity Code: Missed Opportunity

Missed Opportunity was originally considered as an Inclusivity code because it was thought it could be used to outline instances where inclusivity in the Earth system was outright ignored in circumstances where it would have been beneficial (from an ESL perspective) and generally appropriate, even logical/expected, to see a display of inclusivity (essentially revealing clear contradictions to inclusivity in ESL and ESL altogether). Much like No Complexity, though, Missed Opportunity was difficult to apply and was given up on naturally at some point during the coding process. This can be largely explained by the awkward/ambiguous decision-making associated with deciding whether a selection of text could or even should have expressed some form of inclusivity but did not – a difficult thing to do with any degree of certainty (to acquire worthwhile/defendable results) and certainly a difficult thing to do in a reasonable amount of

time and consistently across hundreds of pages of text without slowing down the coding process too much. Ultimately, committing to applying this code across all documents would have likely produced overly subjective and unproductively harsh results regarding the documents' support of inclusivity for ESL, and so its lack of follow-through is deemed acceptable for this study. With this, there is no analysis to discuss regarding Missed Opportunity.

3. Interdependencies

Per the ESL conceptual framework (Figure 1) and the ESL literature explored in the Literature Review, interdependencies are the third and (in this study) final major element of ESL. Specifically, supporting ESL looks like consistently and productively/comprehensively acknowledging the interdependencies between different geographic areas, humans and Earth, humans and non-humans and the present and future in all aspects of legal decision-making and, more generally, the pursuit of justice. Importantly, for such acknowledgements to truly foster sustainable outcomes, one should address how each party depends on the other instead of suggesting or stating only a one-sided relationships exists, as this confirms/solidifies each party's (equal) significance and thus makes it more likely that all parties will be properly considered in decisions and subsequently experience sustainable outcomes. As well, any acknowledgment must also account for historical/maintained imbalances/inequalities (between geographic areas in the Global North versus Global South, humans versus Earth, humans versus non-humans and the present versus future, such that humans, particularly those in the Global North, and the present day are favored) and should therefore take an approach that emphasizes equality and equity to ensure the act of acknowledging interdependencies and the

outcomes from doing so properly and fairly benefit all parties in the Earth system. Ultimately (from an ESL perspective), the purpose of this acknowledgement in legal decision-making is to transform the writing and implementation of human laws to foster more sustainable outcomes for all parties in the Earth system.

Altogether, Interdependencies codes were applied significantly less than those for Complexity or Inclusivity. This could be explained by reasons provided immediately prior to Section 1a as well as Section 2a of the Analysis (the opening paragraphs for Complexity and Inclusivity, respectively). Overall, Interdependencies codes were still applied well given there were only four legitimate codes to apply, though this does not necessarily mean that the documents adequately acknowledged interdependencies in a manner and/or extent that aligns completely with ESL.

a. Interdependencies Code: Geographic Areas

As an aspect of interdependency in ESL, acknowledging interdependencies between different geographic areas in both decision-making and legal systems more generally is necessary to properly recognize these areas as parts of the same Earth system who inherently impact/depend on each other (regardless of man-made borders, geographic distances or, generally speaking, the particular decision/law being drafted or implemented) so that any planning and/or actions in one geographic area are capable of fostering good outcomes (maximizing the potential benefits while minimizing the potential costs/impacts) for all geographic areas and the Earth system as a whole. Importantly, no geographic area should appear as favored in any interdependent relationship (such that beneficial/sustainable outcomes are seemingly or clearly prioritized for that area over another), and any

acknowledgment of interdependencies should seek to account for/correct rather than maintain or worsen any inequities between geographic areas (such as those between areas in the Global North versus Global South) so that outcomes are equally beneficial/sustainable for all areas. With this, supporting ESL looks like addressing two or more geographic areas as participants in an interdependent relationship and considering ways in which they impact/depend on one another in a manner that appears reasonably capable of promoting/ensuring (equally) sustainable outcomes for all geographic areas in the Earth system and other parties as well.

As a code, Geographic Areas was applied the second-least of all Interdependencies codes and was not applied at all in three documents. Six additional documents saw five or fewer applications (though more than zero) and just two documents (Leatherback Turtle and Monarch Butterfly) collectively accounted for over half of the 165 total applications. With this, Geographic Areas was not applied much (in general or in most of the documents), which may suggest a misalignment with ESL through seemingly poor acknowledgment of interdependencies between different geographic areas. Notably, the two documents with the most applications focus on species with well-known migration patterns that make it so the same species and even the same populations spend significant time in multiple geographic areas every year, providing a clearer and stronger connection between their conservation (and thus their SARA documents) and interdependencies between different geographic areas compared to other species and their SARA documents. However, this may justify a larger number of applications for these documents but does not justify such low application numbers for all other documents, as supporting ESL looks like acknowledging interdependencies between different geographic areas more regularly in all circumstances.

The ways in which the documents expressed Geographic Areas revealed nine distinct themes. Key themes include: (1) Knowledge & Data Sharing, (2) Climate Change, (3) Supporting Each Other's Efforts, (4) Receiving Benefits Abroad, (5) Threats Only Abroad and (6) Benefits for the World. Key theme (1) is the dominant theme with a contribution percentage of 41%, outlining how the most common display of interdependence between different geographic areas involves them depending on one another for information about a species. Generally, the ways in which Geographic Areas was applied displayed some degree of support for ESL in that interdependencies between different geographic areas were acknowledged, and such acknowledgements were often framed as significant/crucial to understanding and improving the circumstances of various species as well as confirming the value of wildlife and their conservation as something that extends beyond one geographic area. With this, numerous instances where interdependencies between geographic areas were acknowledged appeared capable of promoting/ensuring sustainable outcomes for wildlife and multiple geographic areas in the Earth system. However, this support for ESL is limited because 1) expressions of the code were generally limited to North America and/or the precise countries where a particular species is presently known to exist, ultimately excluding interdependencies beyond this strict criteria that would have showcased how all kinds of geographic areas depend on one another to support wildlife and the Earth system more generally, 2) as an extension of item 1, expressions of the code generally only referred to certain apparent interdependencies such as knowledge or data or actions that literally cannot be gathered or taken without the direct involvement of another geographic area (due to certain advantages granted to one geographic area over another), ultimately failing to mention ESL-supportive, Earth system-level interdependencies

such as how the well-being of a species (and subsequently an ecosystem) in one geographic area impacts other geographic areas, regardless of which areas the species (or ecosystem) can be found, 3) some expressions of the code were overly general, acknowledging an obscure degree of interdependence between geographic areas that ultimately does not appear capable of promoting/ensuring sustainable outcomes through said acknowledgement, 4) some expressions of the code outlined limitations such that an acknowledgement of interdependencies between geographic areas does not mean that all areas will put in the same effort to foster more sustainable outcomes, or that one area can use an interdependent relationship as permission to ensure (on their own) that the potential for sustainable outcomes is maximized through matters pertaining to another geographic area (e.g., doing everything in their power to minimize a threat to a species that only occurs in another geographic area), as different geographic areas ultimately have distinct rights over their respective area and can choose any course of action they see fit, regardless of any acknowledged interdependencies with other geographic areas and the significance assigned to them – such limitations, when made apparent, weaken the ability for the acknowledgment of interdependencies between geographic areas to effectively promote/ensure sustainable outcomes. Altogether, these items represent potential or actual misalignments with ESL that do not necessarily extinguish the support for ESL offered through much of Geographic Areas' expressions, but certainly limit it. Expressions of key theme (1) align with the above analysis, showing some support for ESL by discussing interdependencies between geographic areas surrounding the collection and utilization of species-specific information and often doing so in a manner that seems capable of promoting sustainable outcomes, but limiting this support by focusing only on geographic areas

known to house a certain species and having some discussions of interdependencies be overly general. Expressions of key theme (2) are unique in that they focus on mentions of climate change, and climate change as a phenomenon inherently speaks to interdependencies between geographic areas since any area can influence climate change to some degree while all geographic areas are impacted by it, however the majority of this theme's expressions do not explicitly mention or indirectly refer to climate change as a display of interdependence between geographic areas but simply an environmental phenomenon that threatens species, limiting the ability for these expressions to offer any support for ESL through the interdependent aspect of climate change. This perhaps outlines an area for SARA to improve upon, as climate change can be used to express interdependence between geographic areas in a manner that promotes sustainable outcomes. Expressions of key themes (3), (4) and (5) are similar to those of key theme (1) in how they show limited support for ESL, though they are particularly guilty of outlining the limitations to do with geographic areas having distinct rights over their respective areas (item 4 of the potential ESL misalignments listed above). Finally, the single expression of key theme (6) arguably fully supports ESL by saying all geographic areas on Earth are interdependent on one another as all areas need healthy species/ecosystems to support the world as a whole, though this only occurred in a single instance and never in a species-specific document (only in the SARA legislative document).

Overall, Geographic Areas saw low application counts (overall and across most documents) and was only applied adequately in select few documents that focus on species with well-known migratory patterns and therefore must involve other geographic areas when discussing the species' conservation. Based on this analysis, SARA could enhance its support for

ESL by acknowledging interdependencies between geographic areas more often in nearly all documents. Thematically, Geographic Areas displayed some support for ESL that could be enhanced further by 1) mentioning geographic areas as well as aspects of interdependence that better reflect the reality of Earth as one system with many interconnected parts, rather than only focusing on geographic areas and their interdependencies specific to a species' various habitats, 2) ensuring acknowledgments of interdependencies between geographic areas include enough details to be reasonably considered capable of promoting/ensuring sustainable outcomes for all parties in the Earth system, 3) outlining plans to address/overcome limitations to do with different geographic areas having distinct rights over their respective areas, such as by establishing accountability measures to ensure all mentioned geographic areas display the same commitment to wildlife conservation and that one will not intentionally limit another's efforts or the combined efforts of all areas, and 4) ensuring acknowledgments of interdependencies between geographic areas account for inequities between the areas so that outcomes genuinely and equally benefit all areas/parties in the Earth system.

b. Interdependencies Code: Present vs. Future

As an aspect of interdependency in ESL, acknowledging interdependencies between present and future time periods (including all parties in the Earth system as they exist in each time period) in both decision-making and legal systems more generally is necessary to properly recognize both time periods as integral parts of the Earth system's (and every living thing's) current, short-term and long-term well-being so that any planning and/or actions based around either time period are capable of fostering good outcomes (maximizing the potential benefits while minimizing the potential costs/impacts) for the Earth system in both time periods.

Importantly, there is generally a bias that favors the present time period in decision-making, and so any acknowledgment of interdependencies should seek to account for/correct rather than maintain or worsen this bias so that outcomes are equally beneficial/sustainable for both time periods. With this, supporting ESL looks like addressing the present and future time period as participants in an interdependent relationship and considering ways in which they impact/depend on one another in a manner that appears reasonably capable of promoting/ensuring (equally) sustainable outcomes across both time periods for the Earth system.

As a code, Present vs. Future was applied the least of all Interdependencies codes with three documents having zero applications and six other documents having just one to five applications. Only RS+APs saw relatively substantial numbers of applications for this code, with Woodland Caribou seeing 31 of the 114 total applications itself (due to the document's extraordinary attention granted to both the present and future well-being of woodland caribou populations across Canada, perhaps brought about by the species' well-known significance to Canadian Indigenous peoples). Altogether, this suggests SARA is misaligned with ESL due to a general lack of acknowledged interdependencies between present and future time periods.

The ways in which the documents expressed Present vs. Future revealed twelve distinct themes. Key themes include: (1) Climate Change, (2) Impact on Future Outcomes, (3) Ensure Long-Term Viability, (4) Preservation for Future Human Generations and (5) Preservation for Future Non-Human Generations. Key theme (1) was the dominant theme with a contribution percentage of 49%, outlining how the most common display of interdependence between present and future time periods involved the phenomenon of climate change. Generally, the

ways in which Present vs. Future was applied displayed a moderate degree of support for ESL in that interdependencies between present and future time periods were mentioned and these instances often did well to state such interdependencies as significant to the guiding principles, planning and actions associated with wildlife conservation. With this, numerous expressions of Present vs. Future appeared capable of promoting/ensuring beneficial outcomes for the Earth system across present and future time periods through the acknowledgement of these time periods' interdependencies. However, some instances were overly general/ambiguous in the acknowledgement of interdependencies between the two time periods, limiting the capability for an acknowledgment to promote/ensure beneficial outcomes as desired for ESL. As well, there were select instances where interdependencies between time periods were outlined or alluded to, but the present time period was seemingly deemed more significant such that it was not held completely accountable for doing its equal part to support its interdependent relationship with the future (e.g. climate change was identified as a threat in a particular context, and it was made clear that its physical impacts would occur in the future but still affect the present in how we both assess a species as at-risk and design strategies to conserve the species, but neither the general nor specific ways in which we can manipulate (accelerate or, more importantly, slow down) climate change itself were mentioned, suggesting that the present time period will not be tasked with fully supporting the future (as much as it can/should to truly foster sustainable outcomes) despite their interdependent relationship). Therefore, the support for ESL offered by expressions of Present vs. Future is ultimately limited and, at times, misalignments with ESL are shown as well or instead. Expressions of key theme (1) align with the above analysis, using climate change to showcase interdependence between

the present and future in a manner that sometimes appears capable of promoting/ensuring beneficial outcomes (for all time periods across the Earth system), though in many instances it appears as though the present time period is favored by not being held totally accountable for its role in climate change impacts expected to occur in the future. Expressions of key theme (2) involve statements that outline how something occurring in the present will or can impact circumstances in the future – a crucial aspect of the interdependence between the two time periods. Such statements represent a direct and productive acknowledgement of this interdependence and are often strongly and specifically connected to the planning and implementing of conservation efforts, therefore appearing capable of promoting/ensuring beneficial outcomes as desired for ESL (generally speaking). Expressions of key theme (3) discuss the long-term viability of a species as a key objective of wildlife conservation, often making it clear that the conservation efforts (or the lack thereof) planned/executed in the present can directly impact a species' long-term viability and that their long-term viability is a key consideration when assessing their well-being/status in the present. With this, these expressions generally show some support for ESL, though some expressions are overly general/ambiguous (with regards to the definition of "long-term viability" itself, among other things), which limits its overall display of support for ESL. Expressions of key themes (4) and (5) discuss the preservation of something (such as a species or population in their entirety) in the present as being beneficial for the future, doing well to confirm the interdependence between the two time periods to the extent that not only can the future benefit from actions taken in the present, but the present can actually benefit from simply knowing the future will

experience certain circumstances over others. These expressions display clear support for ESL, but are few in numbers (only nine expressions in total).

Overall, Present vs. Future was rarely applied, both in general and across most documents, suggesting a misalignment with ESL that can be addressed by acknowledging the interdependencies between present and future time periods more often and more consistently across SARA. Thematically, Present vs. Future was fairly supportive of ESL when it was actually applied, though the recognized bias for the present time period was not entirely extinguished/addressed to fully support ESL and more could have been done in numerous instances to expand on the relationship between the present and future in a manner more capable of promoting/ensuring beneficial outcomes for both time periods across the Earth system. This conclusion somewhat aligns with those drawn for other codes relevant to the future, showcasing how this time period receives less attention and significance than it should from an ESL perspective.

c. Interdependencies Code: Humans vs. Earth

As an aspect of interdependency in ESL, acknowledging interdependencies between humans and the Earth as a whole in both decision-making and legal systems more generally is necessary to properly recognize humans as influential to the Earth's well-being but also as simply another part of the Earth's system who depend on the planet and all its aspects to survive. Through this recognition, one is more equipped to ensure that any planning and/or actions are capable of fostering good outcomes (maximizing the potential benefits while minimizing the potential costs/impacts) for the entire Earth system including humans as opposed to just humans, who are generally favored in decision-making currently (at least

partially because of a lack of acknowledgement/understanding of their interdependence with their own planet, one could argue). With this, any acknowledgment of interdependencies between humans and the Earth should seek to account for/correct rather than maintain or worsen this human bias so that outcomes are equally beneficial/sustainable for all parties in the Earth system (and thus the planet as a whole). Altogether, supporting ESL looks like addressing the Earth and humans as participants in an interdependent relationship and considering ways in which they impact/depend on one another in a manner that appears reasonably capable of promoting/ensuring (equally) sustainable outcomes for all parties in the Earth system.

As a code, Humans vs. Earth was applied the second-most of all Interdependencies codes, though its numbers lagged far behind that of the most-applied code (287 versus 1424 for Humans vs. Non-Humans) and were much closer to those for the two least-applied Interdependencies codes already analyzed here. The code was applied at least three times in each document, and ten documents each applied the code twelve or more times, though none of the Mgmt. Plans did (all had application counts below ten for this code) and the RS+APs saw the most applications of the document types. It is perhaps encouraging for ESL that Humans vs. Earth was applied in every document and moderately well in a fair number of documents, though higher application counts in select documents and in general are likely necessary to fully support ESL.

The ways in which the documents expressed Humans vs. Earth revealed three distinct themes. These themes, which are all considered key themes here, include: (1) Earth Relying on Humans for Protection/Mgmt., (2) Climate Change and (3) Human Well-Being From Earth. Key theme (1) is the dominant theme with a contribution percentage of 86%, outlining how most

mentions of interdependence between humans and the Earth focused on the Earth's dependence on humans (given how influential humans can be on the Earth's well-being). This theme being so dominant arguably represents a misalignment with ESL in that it maintains/worsens the problematic bias where humans are deemed overly significant instead of equal members in an interdependent relationship (and in the Earth system altogether) by focusing far more on how something depends on humans than vice versa, ultimately limiting the recognition of the value of others in the Earth system (and the planet itself) and thus limiting the ability for sustainable outcomes to be promoted/ensured for all parties in the Earth system through any acknowledgment of interdependencies. Generally, the ways in which Humans vs. Earth was applied displayed only limited/inconsistent support for ESL, as most expressions of the code did not address interdependencies between humans and Earth in a manner that appeared capable of promoting/ensuring beneficial outcomes for both humans and the entire world, thus displaying more contradictions with than support for ESL overall. This is primarily due to the fact that humans were generally indicated as the more significant party within the interdependent relationship between humans and Earth (with relatively little attention granted to how humans depend on their own planet), focusing heavily on how humans are capable of both harming and enhancing the Earth's well-being without instilling confidence that, through the recognition of interdependence between the two, decisions will be made to benefit humans and the entire planet equally. There were expressions of Humans vs. Earth that, regardless of the theme, showed support for ESL through recognitions of interdependence tied directly to decisions that appear capable of benefiting the Earth and not just humans, though this was only a minority of the code's expressions. Expressions of key

theme (1) varied greatly in how they stated or suggested ways that Earth is dependent on humans, but generally they did not adequately address interdependence between humans and Earth in a transformative, ESL-supportive way (capable of bringing about better outcomes for all parties in the Earth system) because there was often a lack of direct or indirect language to confirm or suggest that humans will genuinely/truthfully use any recognition of their influence over the Earth's well-being to ensure beneficial outcomes for the entire world (without favoring humans) in every instance. Expressions of key theme (2) focus on climate change, which inherently speaks to interdependencies between humans and Earth given that 1) the climate system is a major aspect of the Earth system that impacts every part of the planet, 2) humans are capable of influencing climate change – one of the many ways that they can manipulate the entire planet's well-being, and 3) climate change, aside from humans' influence, is one of the many ways that Earth itself can manipulate the well-being of humans. However, most expressions of key theme (2) do not emphasize this inherent aspect of climate change and ultimately do little to address any interdependence between humans and Earth through mentions of climate change, instead focusing on how Earth impacts non-humans through climate change (drawing little to no attention to how humans play a role in the phenomenon itself). Expressions of key theme (3) generally involve clear statements on how humans depend on the Earth (for certain benefits and/or their general well-being), often showing support for ESL in doing so. However, there were only 24 of these expressions in total, and some were questionable or limited in their ability to promote/ensure beneficial outcomes for humans and Earth equally (such as expressions where the extent or form of humans' dependence on Earth is framed as weak or subjective rather than inherent/to do with survival).

Overall, Humans vs. Earth was applied relatively often, but too inconsistently/not often enough (in select documents and overall) to fully support ESL. Thematically, Humans vs. Earth appeared to have more examples of misalignments with than support for ESL. Besides simply adding more recognitions of interdependencies between humans and Earth across SARA, support for ESL could be achieved/strengthened by committing to abolishing rather than maintaining any bias that favors humans, ensuring mentions of humans' dependence on Earth match or exceed mentions of Earth's dependence on humans, and consistently using clear and significant examples of interdependence between humans and Earth that are steadfast in their ability to communicate the immense benefits versus consequences associated with supporting both versus one or neither party.

Speaking to biocentric and ecocentric perspectives, the thematic analysis of Humans vs. Earth revealed only weak support for these perspectives as very few code expressions stated or alluded to the intrinsic value of ecosystems and their species. More often than not, the focus was on what humans can do to help the Earth and its species without making it clear that the driving force behind such efforts had to do with something's intrinsic value (generally, the driving forces seemingly pertained to benefiting humans and fulfilling both scientific and legal obligations). To better support biocentric and ecocentric perspectives, particularly the latter, recognitions of interdependencies between humans and Earth should bring more attention to the intrinsic value of Earth and all its parts, including ecosystems and their non-human species, to make it clear that while humans and Earth depend on one another, supporting the Earth's (and our own) well-being effectively and sustainably through this interdependent relationship has a much greater significance.

d. Interdependencies Code: Humans vs. Non-Humans

As an aspect of interdependency in ESL, acknowledging interdependencies between humans and non-humans in both decision-making and legal systems more generally is necessary to properly recognize both groups as equally significant parts of the same Earth system who inherently impact/depend on each other (regardless of common perceptions of humans that depict them as too significantly different from, including more intelligent and/or capable than, non-humans to qualify them as equals) so that any planning and/or actions (performed by humans) are capable of fostering good outcomes (maximizing the potential benefits while minimizing the potential costs/impacts) for both parties in the Earth system equally. Importantly, humans have been/are typically favored in any interdependent relationship, as are certain humans over others (e.g. those of the Global North) as well as certain non-humans over others (e.g. charismatic species), and so any acknowledgment of interdependencies should seek to account for/correct rather than maintain or worsen any inequities between and amongst humans and non-humans so that outcomes are equally beneficial/sustainable for both parties in their entirety. With this, supporting ESL looks like addressing humans and non-humans (specifically or in general) as participants in an interdependent relationship and considering ways in which they impact/depend on one another in a manner that appears reasonably capable of promoting/ensuring (equally) sustainable outcomes for all living things in the Earth system.

As a code, Humans vs. Non-Humans was the most applied Interdependencies code by a large margin (and the most applied code in general), with no document seeing 25 or fewer applications. Four documents each saw 100 or more applications, two of them being RS+APs

(RS+APs in general saw the most applications of the document types). This analysis perhaps suggests support for ESL through the significant recognition of interdependencies between humans and non-humans, though this is perhaps not surprising given the nature of the documents themselves.

The ways in which the documents expressed Humans vs. Non-Humans revealed six distinct themes. Key themes include: (1) Species Gaining From Our Actions, (2) Species Losing From Our Actions, (3) Humans Gaining From Biological Resources, (4) Humans Gaining From Their Existence and (5) Humans Losing From Their Actions or Existence. Key theme (1) was the dominant theme with a contribution percentage of 88%, outlining how most recognitions of interdependence between humans and non-humans focused on non-humans depending on humans for improvements to their well-being. Generally, the ways in which Humans vs. Non-Humans was applied displayed considerable misalignments with ESL and only limited support. Regarding the latter, there were instances where recognitions of interdependence between humans and non-humans clearly indicated how beneficial outcomes (of some form and extent) will likely be fostered for both parties through actions driven by the recognitions themselves. However, the majority of code applications failed to support ESL (in any capacity or beyond a limited capacity, depending on the instance) primarily because 1) the focus was almost entirely on how non-humans depend on humans, ultimately failing to properly and consistently recognize humans and non-humans as equal participants in an interdependent relationship (instead suggesting that humans are the most significant of the two), 2) no apparent (let alone consistent) efforts were made to mention or address inequities amongst humans or amongst non-humans while recognizing interdependencies between humans and non-humans, 3) the

typical favoring of humans was never explicitly mentioned/addressed (as something that exists but should be avoided/corrected) while recognizing interdependencies between humans and non-humans, and 4) while there were considerable examples of humans showing awareness of various forms of human-based threats to non-humans as well as descriptions of how humans can/plan to reduce the presence/extent of these threats and protect/recover non-humans in general, it was often stated or suggested that the degree to which humans can genuinely foster beneficial outcomes for non-humans (and thus do their part to support/maintain their interdependence with non-humans upon recognizing said interdependence) is rather ambiguous/limited instead of definitive/comprehensive due to complexities in human systems (such as rules/laws surrounding land rights and jurisdictional powers and limitations, or the influential desire/perceived need to ensure conservation efforts are deemed cost-effective) and the presence of seemingly unaddressed human limitations and biases (such as both decisions and outcomes being limited by how much select humans believe they know about something at a certain time, or the fact that select humans are trusted to define a species' recovery goals and population/distribution objectives without apparent accountability measures in place to ensure the outcomes will truly benefit non-humans and not favor humans) – these common instances make it so any recognition of interdependence is unlikely to promote/ensure (equally) sustainable outcomes for all living things in the Earth system. Altogether, these items represent misalignments with ESL that were unfortunately more common/significant than any displays of support for ESL expressed by Humans vs. Non-Humans. Expressions of key theme (1) generally align with this analysis, focusing on how the well-being/positive circumstances of non-humans are heavily dependent on the thoughts and actions of humans but not clearly and consistently

indicating that this recognition will genuinely promote/ensure the well-being of non-humans to the greatest extent possible (primarily due to complexities in human systems and/or seemingly unaddressed human biases and limitations). Expressions of key theme (2) instead focus on how the negative circumstances of non-humans are heavily influenced by humans, but the different magnitudes of impacts experienced by certain non-humans over others (due to human biases/non-biological aspects that typically result in them being considered less significant by humans and thus more threatened/less protected) were never addressed and it was often not indicated that a particular threat/negative circumstance for non-humans would be completely eliminated by humans (often because of complexities in human systems and/or human biases and limitations). Expressions of key them (3) speak to humans depending on non-humans for benefits received from the taking of a non-human's physical body, either in legal or illegal circumstances, including benefits that are perceived as intrinsic to the survival and well-being of select humans as well as those that are strictly recreational/not particularly necessary. These expressions generally clarified how humans understand this dependence on non-humans can directly threaten an entire population or species' existence and that the common objective is to sustain these benefits for humans while ensuring no population or species is existentially threatened by providing said benefits, but it is stated or suggested that the primary driver is to abide by laws that promote/ensure beneficial outcomes for humans, reducing the likelihood that any recognition of this aspect of interdependence between humans and non-humans will result in beneficial outcomes for both humans and non-humans equally. Expressions of key theme (4) discuss how humans depend on non-humans for benefits received from non-humans simply existing, including benefits to do with a person's subjective appreciation of a species and

its habitat, a person's particular culture and/or peoples' inherent need for healthy ecosystems with healthy species as a prerequisite to survive on Earth. Some of these expressions displayed clear support for ESL by describing the significance of non-humans in their interdependent relationship with humans and doing so in a manner that appeared capable of promoting beneficial outcomes for non-humans. However, there were relatively few expressions of key theme (4) in general (85 out of 1424 for the code altogether; just a 6% contribution percentage) and in some instances, benefits provided to humans from the existence of non-humans was discussed as a potential or assumed phenomenon rather than something that is intrinsic and undeniable, decreasing the likelihood that this form of recognition of interdependence will promote/ensure beneficial outcomes for both humans and non-humans equally. As well, it was sometimes stated or suggested that the benefits that are more cultural or subjective (not inherent to all humans) granted a species more significance for conservation purposes, making it less likely that beneficial outcomes would be promoted/ensured for all non-humans equally. Expressions of key theme (5) focus on how the well-being of humans can depend on non-humans such that non-humans are capable of bringing about harm/negative circumstances to humans through both legitimate (the destruction of property, livestock, etc. that is key to a person's livelihood) and illegitimate (striking fear or confusion in humans, often due to a person's lack of understanding regarding a particular non-human) ways. In many instances, such harm (perceived or actual) delivered to humans by non-humans results in humans taking countermeasures that not only harm non-humans in return, but are capable of wiping out an entire population or species of non-humans. Generally, it was stated or suggested that these negative responses by humans were/are more harmful than the original harm delivered by the

non-humans, and the focus should be on eliminating/mitigating this perceived or actual harm delivered by non-humans (by manipulating non-humans, humans or both) to undo the need for any countermeasures and ultimately promote/ensure beneficial outcomes for both parties. A select few of these expressions displayed support for ESL, but most misaligned with ESL because, despite any harm delivered to humans by non-humans generally being unintentional/impersonal and despite the fact that humans generally encroach more on non-humans' territory than vice versa, it was often stated or suggested that non-humans rather than humans should be forced to change or move to improve humans' well-being, showing a clear bias for humans amidst recognized interdependence between humans and non-humans.

Overall, Humans vs. Non-Humans was applied immensely, more than any other code across all categories, though this may simply be a result of the documents being designed to address the recovery/protection of non-humans by humans. Thematically, Humans vs. Non-Humans frequently/predominantly contradicted ESL rather than supporting it, leaving significant room for SARA to align better with ESL through the recognition of interdependence between humans and non-humans. Specifically, it is recommended that SARA does more to address the bias that favors outcomes for humans over non-humans (and certain non-humans over others) and to ensure that the majority of recognitions of interdependence between humans and non-humans directly fuel holistic/comprehensive actions that are genuinely capable of promoting/ensuring beneficial outcomes for both parties equally.

Speaking to biocentric and ecocentric perspectives, the thematic analysis of Humans vs. Non-Humans revealed only weak support for these perspectives. While there were code expressions that directly spoke to the intrinsic value of non-humans and ecosystems, such

expressions were infrequent and ultimately weak in their significance. Instead, recognitions of interdependence between humans and non-humans generally discussed non-humans (and their ecosystems more indirectly) as elements capable of being manipulated (rather easily, for better or worse in terms of non-humans' collective/individual well-being) by humans, primarily for the purposes of providing various sorts of benefits for humans. Ideally, recognizing this particular interdependent relationship involves characterizing each party as inherently valuable (both aside from and within the interdependent relationship itself), which would then grant both parties an equal status of immense significance and make it more likely for the discussion of their interdependence (in the contexts of conservation, decision making and legal systems more generally) to promote/ensure equally beneficial outcomes for both parties rather than risking or realizing the favoring of one party over the other (namely humans).