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Wetland loss in Alberta: Identifying successes, barriers, and unintended outcomes of public policy

by

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For Evan, Zachary, and Dylan

May your children also know the joys that come
from peering into the water from the edge of a wetland.

ABSTRACT

The province of Alberta adopted a wetland policy in 1993 to manage wetlands in the central and southern regions of the province. Despite a stated commitment to review the policy every five years, to date, no policy evaluation has been conducted. Consequently, little is known about whether wetland policy goals have been achieved and what factors influence government decision making.

The aim of this research is to describe and explain the factors that have influenced wetland policy implementation and outcomes in Alberta since the inception of the wetland policy. Using a mixed-method approach, this research seeks to: 1) describe key historical events and factors that have influenced contemporary wetland management; 2) quantify compensation outcomes and evaluate outcomes relative to stated management guidelines; 3) examine existing power-relations and identify mechanisms of power that influence the development of contemporary wetland policy discourses and government decision making.

Results reveal a resourcist paradigm that has dominated water policy and wetland management in Alberta since the late 1800s. This has created a legacy of federal and provincial laws and policies that consistently prioritize industrial development ahead of environmental protection. As a result, wetland impacts are rarely avoided and compensation has become a routine decision-making practice. When compensation outcomes were quantified, actual outcomes failed to achieve the standards outlined in provincial guidelines for compensation. This failure was attributed to agency capture, which appears to be driven in part by overhead governance and organizational goal ambiguity. Contemporary wetland decision making and policy development is also influenced by a privileged account that maintains wetland loss should be 'balanced' with economic development. This

privileged account has been maintained through privileged access to key decision makers, and has created structures of knowledge that influence decisions of street-level bureaucrats.

This research provides evidence for the need to give greater attention to the decision-making environment and to consider how power operates to create structures of knowledge that constrain agency decisions. Without giving greater attention to factors that influence how, why, and in whose interest policy decisions are being made, little progress can be made in producing effective, rather than symbolic, policy action.

PREFACE

By necessity, the transdisciplinary nature of this dissertation has lent itself to collaboration with a number of individuals who share a passion for learning, knowledge, and wetlands. As such, I would like to acknowledge my co-authors and collaborates, from whom I learned a great deal and who dedicated their time, energy, thoughts, and patience to the development of one or more of the manuscripts that appear as chapters in this dissertation.

The manuscripts that are presented in this dissertation have been modified and/or expanded to fit within the dissertation as a whole.

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CHAPTER 1

General Introduction and Thesis Overview

1.1. Introduction

Environmental problems are rooted in complex and adaptive ecological and social systems that are dynamic across both space and time (Holling 2001). Due to the dynamic nature of these systems, there is general agreement that the development of effective environmental policy requires a more integrated and holistic systems approach: one that considers issues of ecology, economics, politics, and culture (Peterson 2000; Nightingale 2003; Nygren & Rikoon 2008). Much of the current scholarship examining environmental and resource management problems remains discipline-based and narrowly focused within a single domain of study, with little consideration for how ecological and social systems interact (Pritchard & Sanderson 2002). This constrained view of environmental problems has often led to the development of environmental policy and supporting governance structures that are sub-optimal, rigid, and slow to respond, ultimately resulting in a loss of both ecological and social resilience (Peterson 2000; Holling 2001; Gunderson & Holling 2002).

The management of water resources in Canada is one area of environmental management where government policies and decision making has come under increased scrutiny and criticism. Concerns over water quality and quantity, aquatic habitat loss and species decline, non-native species invasions, and increasing risks of drought and flooding resulting from changing climatic regimes, are just some of

the issues facing water managers across the country. Recent reviews of water management in Canada have been critical, citing problems of horizontal and vertical fragmentation within and between governments, inadequate collection and sharing of data, duplication of effort and lack of coordination between and within governments and non-government agencies, and a lack of monitoring and enforcement of existing laws and policies (Hill et al. 2008; Bakker & Cook 2011; Clare et al. 2011; Corkal et al. 2011). The increasing withdrawal of both the federal and provincial governments from the regulation of water resources, in favour of delegating responsibility for water governance to non-state actors, has also brought forward emerging issues and questions concerning who gets to participate in these new governance arrangements, whether the decision-making process within these new arrangements is equitable and transparent, and to whom these non-state actors are ultimately accountable (Nowlan & Bakker 2010; Bakker & Cook 2011).

From the perspective of maintaining both aquatic and terrestrial ecosystem health, wetlands are considered to be a critically important component of water resource management in Canada. Ecologically, wetlands are a keystone habitat for a large number of aquatic and terrestrial species, as well as being significant components of larger hydrologic systems that provide important ecosystem services to human communities. Considered the "kidneys of the landscape", wetlands serve a crucial role in water filtration and treatment, and help stabilize water supplies through the amelioration of both floods and droughts (Mitsch & Gosselink 2007). Wetland ecosystems also provide a number of less recognized regulating, provisioning, cultural, and supporting services that significantly contribute to human well-being, such as nutrient cycling, erosion control, pollination, and aesthetic appreciation (Millennium Ecosystem Assessment 2005).

Despite the ecological, cultural, and economic importance of wetlands, the loss of these habitats to human development over the last 200 years has been substantial. Across Canada, it is estimated that as much as 14% of wetlands have been lost, with these losses approaching 70% in southern Alberta (Rubec 1994; Alberta Water Council 2008). While Alberta was one of the first provinces in Canada to introduce a wetland policy in 1993, this policy has been restricted to the central and southern settled regions of the province (the "White Area"), where it is estimated that wetland loss continues at an annual rate of between 0.3 to 0.5%

(Alberta Water Council 2008). In large portions of northern Alberta (the "Green Area"), where peatlands are abundant but existing wetland policy does not apply, the historic and annual rate of wetland loss is largely unknown; however, the loss of wetlands in this region has increased substantially over the last decade as a result of rapid oil and gas development (Alberta Water Council 2008).

The continuing loss of wetland habitat and the apparent disparity between wetland policy goals and outcomes in the central and southern regions of Alberta has raised serious concerns over the effectiveness of wetland governance in the province. While policy evaluation is typically considered a critical component of adaptive and responsive management, to date, wetland policy outcomes in Alberta have never been critically evaluated. As a result, very little is known about the extent to which wetland policy goals in Alberta have been achieved or whether the use of selected policy tools contribute positively towards maintaining wetland area and function. In addition, minimal attention has been given to the institutional frameworks, agency culture, and decision-making processes that are associated with wetland governance in Alberta. Thus, little is known about which policy actors are most influential, what values are given the greatest priority in policy development, and what regulatory approaches are considered realistic or legitimate for guiding decisions about wetland management and conservation. This lack of transparency has prevented the public from fully understanding the factors that continue to drive contemporary wetland loss, which threatens the legitimacy of the existing wetland policy. Understanding the factors that continue to drive wetland loss in Alberta is particularly germane at this point in time, as the provincial government is engaged in developing a new wetland policy that will direct land use decisions and wetland management throughout the province (Government of Alberta 2010).

1.2. Defining the Research

1.2.1. Research Aim and Objectives

While a wetland policy has been in place in Alberta since 1993, the government has never comprehensively reviewed or evaluated policy outcomes. Consequently, there is very little known about the extent to which policy goals have been achieved over the last 19 years, or whether the use of selected policy tools have positively contributed towards the maintenance of wetland functions and

benefits. Thus, the primary aim of this research is to describe and explain the factors that have influenced wetland policy implementation and compensation outcomes in central and southern Alberta since the inception of the interim wetland policy in 1993. Specifically, this study employs both qualitative and quantitative methods to achieve the following research objectives:

1. Identify and describe key historical events and factors (i.e., ecological, social, economic, and political) that have influenced contemporary wetland management and policy decisions in Alberta.

2. Quantify key policy outcomes, including wetland avoidance and compensation, and evaluate these outcomes relative to stated management objectives and guidelines.

3. Examine existing power-relations among key policy actors and identify mechanisms of power that have influenced the development of contemporary wetland policy discourse and government decision making.

1.2.2. Research Scope and Approach

Wetland management in Alberta includes a vast array of actors and interests that operate and change across temporal and spatial scales, making wetland policy evaluation a challenging task. Given the complexity of including multiple actors across large geographic and temporal scales, the scope of this dissertation was narrowed to focus on specific policy actors, locations, and periods of time that were most relevant to the research question under consideration. The strength of this work lies in the transdisciplinary lens that was used to examine each of the major research questions, and the application of both qualitative and quantitative methods to uncover, describe, and measure both the perceptions and realities of wetland policy implementation and outcomes in Alberta.

While there is a vast number and array of policy actors who actively influence wetland policy decisions in Alberta, this research draws heavily on in-depth, semi-structured interviews with key informants (see Appendix A for interview guide). Key informants are individuals within a group or community who possess 'expert' or specialized knowledge, and as a result, offer an 'insider's

perspective' on issues or problems (Tremblay 1957; Given 2008). The use of the key informant technique was essential to achieving the aim of this study, as key informants possess first-hand, in-depth, and privileged knowledge about wetland policy implementation in Alberta.

In total, 34 key informants were purposively sampled using a snowball or network sampling approach (Tongco 2007), and were selected from a broad range of organizations, including: municipal, provincial, and federal governments (17 interviews); environmental non-governmental organizations (5 interviews); industry (including agriculture, oil and gas, and land development sectors - 6 interviews); and environmental and engineering consultants (6 interviews). Semi-structured interviews were used to allow for comparisons between responses, such that variations and commonalities between the responses could be identified (Given 2008). Interviews ranged in length between one and three hours, and were held in a location of the participants choosing, which most typically included a private office setting. All interviews were transcribed and where organized into conceptual themes in NVivo (QSR International Pty Ltd. 2008) using inductive coding (Thomas 2006). Data from these interviews were used in each of the chapters presented in this dissertation to provide a description of the social, cultural, and political context that has influenced wetland management in Alberta. Data collected from interviews were also used as the foundation of a Q methodological study designed to examine the various discourses that exist around the current and unfolding wetland policy process in Alberta.

In addition to qualitative data gathered from interviews, quantitative data from *Water Act* approvals were used to document wetland impacts in the province between 1999 and 2010. These approval data were primarily gathered for the Beaverhill subwatershed, an area in central Alberta characterized by private and public land-use that ranges from agriculture and urban development, to oil and gas extraction and refining. A subset of *Water Act* approval data was also collected to characterize the wetland impacts that have occurred throughout the White Area of the province. Wetland compensation data from Ducks Unlimited Canada were also used to characterize wetland restoration and compensation activities in the province.

1.3. Theoretical Framework

As a natural scientist who spent nearly a decade working as a wildlife consultant before returning to graduate school, I came to this dissertation research very aware of the phenomenon that has been observed by Peterson (2000), which is that natural scientists, in an effort to remain 'objective' in their work, often ignore the politics of human societies. More often than not, this tendency leads to inadequate or ill-conceived policy recommendations that ultimately result in suboptimal conservation outcomes. As a consequence, there has been increased call to unify, or at the very least, bridge the disciplines of natural and social sciences (Wilson 1998; Gunderson & Holling 2002; Nie 2003; Hobbs & Fowler 2008). This move away from examining environmental problems from a strictly disciplinary perspective is critical to formulating more effective natural resource policy because, as Nygren and Rikoon (2008 p. 773) have observed, "political, ecological, and sociocultural processes of environmental change mingle together in such a complex way that strict distinctions between the natural and the social become artificial". Thus, approaching complex environmental problems from multiple points of entry helps to uncover how ecological conditions both produce, and are contingent upon various social, economic, and political conditions (Nightingale 2003; Nygren & Rikoon 2008).

The unification of disciplinary knowledge is enormously challenging due in part to epistemological differences, as well as frequent difficulties for practitioners and academics to effectively communicate across disciplines. In an effort to help bridge the gap between ecological and social understandings of wetland management in Alberta, this dissertation weaves together empirical and conceptual work from a number of interrelated disciplines, including landscape ecology, environmental sociology, and political ecology. Specifically, this research has been grounded in, and informed by, a number of key concepts that recur as central themes throughout the dissertation, including scale, power, and discourse.

1.3.1. Scale

Scale is generally considered a central theme in landscape ecology and political ecology, as both of these disciplines are interested in the temporal, spatial, and functional scales at which human and non-human individuals, communities, networks, patterns, and processes organize, interact, and function. Despite this

common interest, mismatches between ecological and social scales frequently occur, thereby leading to policies or programs intended to address a specific environmental problem, but that nevertheless result in degradation or loss of habitat and biodiversity (Stevens et al. 2007; Satake et al. 2008). This mismatch occurs primarily because the scale at which social institutions are developed to manage ecosystems is inappropriate given the scale(s) at which internal and external ecosystem processes operate (Dietz et al. 2003; Cumming et al. 2006; Euliss et al. 2008).

For example, in the case of wetland management, landholders exercising their private property rights make land use decisions at small spatial scales, and these land use decisions rarely include more collective or coordinated land use planning at the regional, national, or international scales. This small-scale decision making often conflicts with large-scale ecological drivers, such as climate and hydrology, which influence internal wetland processes such as nutrient cycling and decomposition (Euliss et al. 2008). Such mismatches have historically resulted in land conversion practices that lead to high rates of wetland loss and impairment, even in instances where conservation or policy efforts have succeeded in maintaining individual, isolated wetlands on the landscape. Given the importance of understanding how these mismatches in scale can produce sub-optimal or unintended policy outcomes, this dissertation gives specific attention to how formal institutions have been structured across time and space to manage wetlands in Alberta.

1.3.2. Power

While it is important to understand *how* formal institutions have been structured to manage wetlands in Alberta, a more provocative question is *why* the institutions created to manage wetlands are structured as they are. A deeper examination of how the dynamics of wetland ecology have influenced the cultural meanings that have been attached to wetlands, as well as the dynamics of political struggles for control over these ecosystems, provides critical insight into the institutional context of environmental governance in Alberta (Neumann 2005; Nygren & Rikoon 2008).

Acknowledging that there are multiple and competing interests involved in agenda setting, policy formulation, and regulatory decision making is an important

first step in understanding problems of wetland management; however, this recognition alone is insufficient for improving policy outcomes. Rather, it is important to examine and understand the underlying power-relations and mechanisms used by various policy actors to establish and maintain access to, and control over, natural resources and key government decision makers (Ribot & Peluso 2003; Freudenburg 2005). It is only through more carefully examining why particular decisions are made over others, what factors influence those decisions, and whose interests are being served by those decisions, that the effects of systemic or 'hidden' power can be uncovered in the patterns of agency decision making, or conversely, in the act of non-decision making (Bachrach & Baratz 1970; Stone 1980; Lukes 2005).

Systemic power, which differs from more direct and overt 'power over' relationships, is situational and fundamentally shapes the context (e.g., institutions, practices, rules, norms) within which decisions are made, thereby conferring an advantage to particular groups or individuals over others (Stone 1980; Lukes 2005). This hidden power is often overlooked in policy evaluation, an oversight that fundamentally undermines attempts at improving policy implementation and outcomes. As Neumann (2005 p.9) has observed "human transformation of natural ecosystems cannot be understood without consideration of the political and economic structures and institutions within which the transformations are embedded". Thus, examining how powerful actors produce, shape, or structure the decision-making environment is as important as examining the nature of the decisions themselves (Haugaard 2010). This dissertation examines the nature of systemic power in the development and implementation of wetland policy in Alberta, and investigates how power-relations have shaped the practices, rules, norms, and behavior of agency decision makers over time.

1.3.3. Discourse

One way in which powerful actors influence and shape the decision-making environment is to control how problems are understood or framed in the public sphere (Feindt & Oels 2005; Neumann 2005). By influencing the ways in which environmental problems are socially constructed, particular storylines or discourses become dominant over others, thereby "holding in place meanings associated with concepts, objects, and subject positions, which distribute power and privilege

among actors (Hardy & Phillips 2004 p. 300). Discourse and power are thus mutually constitutive, and over time, dominant discourses can become 'privileged accounts' that are taken for granted and largely go unchallenged by the public (Foucault 1977; Freudenburg 2005). Through the naturalization of dominant or privileged accounts, alternative discourses become marginalized, and particular ways of understanding, defining, and acting in response to environmental problems are accepted as legitimate, while others are 'ruled out' as being unreasonable or irrational (Hardy & Phillips 2004).

Discourse can thus operate to structure knowledge in ways that influence the perceptions and practices of key decision makers (Foucault 1977; Rossi 2004; Freudenburg 2005). Understanding how environmental problems are framed and whose interests are being served in the promotion of a particular discourse is an important component to understanding the context for environmental decision making. Thus, this dissertation gives attention to how public discourse around wetland management has been constructed, who has been included or excluded from this construction, and whose interests are being served in the promotion of particular discourses over others.

1.4. Thesis Structure

This dissertation is composed of six chapters, with Chapters 2 through 5 written as stand-alone manuscripts. In Chapter 2, I provide the historical context and background on wetland management and policy development in Alberta. This chapter engages theory from political ecology to better understand and explain how social, economic, and political decisions, attitudes, and practices have been shaped by the physical realities of wetlands on the landscape. In turn, this chapter examines how prevailing social attitudes, legal precedents, and economic decisions have influenced or constrained contemporary wetland management and policy development. Chapter 3 takes a broader view of the contemporary approach to wetland management in North America. Specifically, this chapter examines the 'mitigation sequence' that is commonly used as a framework to direct wetland management decisions. Using a combination of data from interviews and information drawn from a comprehensive literature review, this chapter compares and contrasts experiences and outcomes of the mitigation sequence in Alberta with

that of other jurisdictions in the United States. The objective of this chapter is to better understand why the first step of the mitigation sequence – wetland avoidance – is commonly overlooked in jurisdictions that have adopted this approach to wetland management. The findings of this chapter provide the foundation and rationale for Chapter 4, which more carefully examines the routine practice of wetland compensation in Alberta.

Chapter 4 uses both interview data and quantitative data from *Water Act* approvals to examine wetland compensation outcomes in Alberta. The objective of this chapter is to compare compensation outcomes to key statements made in the provincial compensation guidelines, to determine the extent to which actual compensation outcomes conform to expected outcomes. This chapter specifically examines whether there is evidence of bureaucratic slippage in the implementation of wetland compensation guidelines in Alberta, and if so, whether this slippage is evidence of underlying agency capture.

Chapter 5 examines the public discourse that has recently dominated the wetland policy debate in Alberta. This discourse has called for economic development to be 'balanced' with wetland conservation, yet there is little understanding of how, by whom, and for whom economic prosperity and wetland conservation should be balanced. Drawing on a number of different power theories, this chapter utilizes Q methodology to examine the various discourses that exist around the notion of what 'balance' means in the context of wetland management. This chapter also examines where key government decision makers are positioned within the discourse relative to other powerful policy actors, such as those representing key industries in Alberta.

The final chapter of this dissertation summarizes the key insights and findings of the research, and assesses the strengths and weaknesses of the dissertation as a whole. This chapter also provides suggestions for future research, a summary of conceptual and theoretical contributions, and recommendations for how to improve wetland policy implementation and outcomes in Alberta moving forward.

1.5. Literature Cited

Alberta Water Council. 2008. Recommendations for a New Alberta Wetland Policy. Page 38. Alberta Water Council, Edmonton, AB, Can.

Bachrach, P., and M. Baratz. 1970. Power and poverty: Theory and practice. Oxford University Press, New York, NY, USA.

Bakker, K., and C. Cook. 2011. Water Governance in Canada: Innovation and Fragmentation. International Journal of Water Resources Development 27:275–289.

Clare, S., N. Krogman, L. Foote, and N. Lemphers. 2011. Where is the avoidance in the implementation of wetland law and policy? Wetlands Ecology and Management 19:165–182.

Corkal, D. R., H. Diaz, and D. Sauchyn. 2011. Changing Roles in Canadian Water Management: A Case Study of Agriculture and Water in Canada's South Saskatchewan River Basin. International Journal of Water Resources Development 27:647–664.

Cumming, G. S., D. H. M. Cumming, and C. L. Redman. 2006. Scale mismatches in social-ecological systems: causes, consequences, and solutions. Ecology And Society 11:14.

Dietz, T., E. Ostrom, and P. Stern. 2003. The struggle to govern the commons. Science 302:1907–1912.

Euliss, N., L. Smith, D. Wilcox, and B. Browne. 2008. Linking ecosystem process with wetland management goals: charting a course for a sustainable future. Wetlands 28:553–562.

Feindt, P., and A. Oels. 2005. Does discourse matter? Discourse analysis in environmental policy making. Journal of Environmental Policy & Planning 7:161–173.

Freudenburg, W. 2005. Privileged access, privileged accounts: toward a socially structured theory of resources and discourses. Social Forces 84:89–114.

Foucault, M. 1977. Power/Knowledge: Selected interviews and other writings, 1972-77. Pantheon, New York, NY, USA.

Given, LM. 2008. The SAGE encyclopedia of qualitative research methods. SAGE Publications, Inc. Thousands Oaks, CA, USA

Government of Alberta. 2010. Wetlands - Policy Intent. Government of Alberta.

Gunderson, L. H., and C. S. Holling (Eds.). 2002. Panarchy: Understanding Transformations in Human and Natural Systems. Island Press, Washington, DC, USA.

Hardy, C., and N. Phillips. 2004. Discourse and power. Pages 299–316 in D. Grant, C. Hardy, C. Oswick, and L. Putnam, editors. The Sage Handbook of Organizational Discourse. Sage Publications Ltd., London, England.

Haugaard, M. 2010. Power: A “family resemblance” concept. European Journal of Cultural Studies 13:419–438.

Hill, C., K. Furlong, K. Bakker, and A. Cohen. 2008. Harmonization versus subsidiarity in water governance: A review of water governance and legislation in the Canadian provinces and territories. Canadian Water Resources Journal 33:315–332.

Hobbs, L., and C. W. Fowler. 2008. Putting humans in ecology: Consistency in science and management. Ambio 37:119–124.

Holling, C. 2001. Understanding the complexity of economic, ecological, and social systems. Ecosystems 4:390–405.

Lukes, S. 2005. Three Dimensional Power. in Power: A Radical View Second Edition. Palgrave, New York, NY, USA.

Millennium Ecosystem Assessment. 2005. Ecosystems and human well-being: wetlands and water synthesis. Millenium Ecosystem Assessment. World Resources Institute, Washington, DC, USA.

Mitsch, W., and J. Gosselink. 2007. Wetlands, 4th edition. John Wiley & Sons, Inc., Hoboken, NJ, USA.

Neumann, R. 2005. Making political ecology. Hodder Arnold, London, UK.

Nie, M. 2003. Drivers of natural resource-based political conflict. Policy Sciences 36:307–341.

Nightingale, A. 2003. Nature–society and development: social, cultural and ecological change

in Nepal. Geoforum 34:525–540.
Nowlan, L., and K. Bakker. 2010. Practicing shared water governance in Canada: A primer. University of British Columbia Program on Water Governance, Vancouver, BC, Canada.
Nygren, A., and S. Rikoon. 2008. Political Ecology Revisited: Integration of Politics and Ecology Does Matter. Society and Natural Resources 21:767–782.
Peterson, G. 2000. Political ecology and ecological resilience: An integration of human and ecological dynamics. Ecological Economics 35:323–336.
Pritchard, L., and S. Sanderson. 2002. The dynamics of political discourse in seeking sustainability. in L. Gunderson and C. Holling, editors. Island Press, Washington, DC, USA.
QSR International Pty Ltd. 2008. NVivo Qualitative Data Analysis Software.
Ribot, J.C. & Peluso, N.L., 2003. A Theory of Access. Rural Sociology 68(2):153–181.
Rossi, B. 2004. Revisiting Foucauldian Approaches: Power Dynamics in Development Projects. Journal of Development Studies 40:1–29.
Rubec, C. D. A. 1994. Wetland policy implementation in Canada: proceedings of a national workshop. Winnipeg, MA, Can.
Satake, A., T. K. Rudel, and A. Onuma. 2008. Scale mismatches and their ecological and economic effects on landscapes: A spatially explicit model. Global Environmental Change 18:768–775.
Stevens, C. J., I. Fraser, J. Mitchley, and M. B. Thomas. 2007. Making ecological science policy-relevant: issues of scale and disciplinary integration. Landscape Ecology 22:799–809.
Stone, C. N. 1980. Systemic power in community decision making: A restatement of stratification theory. The American Political Science Review:978–990.
Thomas, D. R. 2006. A General Inductive Approach for Analyzing Qualitative Evaluation Data. American Journal of Evaluation 27:237–246.
Tongco, MDC. 2007. Purposive Sampling as a Tool for Informant Selection. Ethnobotany Research & Applications 5: 147-158.
Tremblay M. 1957. The Key Informant Technique: A Nonethnographic Application. American Anthropologist 59: 688–701.
Wilson, E. O. 1998. Consilience: The unity of knowledge. Knopf Publishing Group, Westminster, MD, USA.

CHAPTER 2

Looking Back: Understanding the History and Political Ecology of Wetland Management in Alberta[1]

2.1. Introduction

Alberta has long been recognized for its bounty of natural resources, from fertile soils and vast grasslands, to majestic forests and abundant reserves of coal, oil, and natural gas. This wealth of natural resources has influenced the direction of economic growth and development in the province over the last century, with the agricultural, forestry, and energy sectors forming the foundation of Alberta's economy. The dependence on resource extraction, use, and export to fuel the economy began early in the history of the province, and has resulted in a human-environmental relationship where the value of natural resources is measured primarily by their "indirect utility" or economic exchange value (Bridge 2009). As a result, natural resources in Alberta have become highly commodified and the landscapes that produce these resources have become primary commodity zones where the environmental and social costs of resource extraction have largely been externalized (Bridge 2001). Over time, this focus on resource extraction, coupled with international trends in economic policy, has led to a neoliberalization of political and institutional structures in Alberta (Timoney & Lee 2001; Davidson & Gismondi 2011), which many scholars argue produce relaxed environmental standards, permissive regulatory processes, and favorable tax regimes that promote capital investment (Peck & Tickell 2002; Boyd 2003; Hessing et al. 2005). In turn,

[1] *A version of this chapter has been submitted for publication. Clare, Krogman, and Foote 2012. The Political Ecology of Alberta, Routledge.*

this history of economic growth and governance has significantly influenced social-environmental relationships in Alberta, and in particular, social perceptions about the value and importance of wetland habitats.

While the scientific community has long recognized the ecological value and importance of wetlands, there has been far less understanding and acknowledgement by the general public that wetlands contribute significantly to ecosystem health and human well-being. As a result, wetland loss over the last century has been substantial. Globally, it is estimated that nearly 50% of wetlands have been eliminated, with losses of inland and coastal wetlands in Europe and North America estimated to be approximately 70% (Worldwatch Institute 2001; Millenium Ecosystem Assessment 2005). In Alberta, wetland loss in the central and southern regions of the province is estimated to be between 60 and 70% (Dahl & Watmough 2007; Alberta Water Council Wetland Policy Project Team 2008), and while Alberta was one of the first provinces in Canada to introduce a wetland policy in 1993, the decline of wetlands in the settled regions of the province continues today at a rate of approximately 0.5% per year (Alberta Water Council 2008).

The objective of this chapter is to examine the historical events, processes, attitudes, and legal precedents that have shaped social perceptions and structural relations between the state, civil society, and the market in an effort to help better explain the continuing history of wetland loss in Alberta. Specifically, this chapter follows the "event ecology" approach of Vayda and Walters (1999), which first identifies the environmental change or event of interest (in this case, wetlands loss), and subsequently works "backward in time and outward in space so as to enable [the construction of] chains of causes and effects leading to those events or changes" (Vayda and Walters 1999 p. 169). In particular, I examine the time and space across which the public and political understanding and perceptions of wetlands have evolved and changed since the late 1800s, and how these attitudes have influenced or constrained contemporary wetland management in Alberta (Marcus 1995; Burawoy 2000). Further, this chapter answers the call from Nygren and Rikoon (2008) to provide a "more thorough examination of shifting relations between ecology and politics in analysis of environmental change" (p.768), by examining the physical and ecological characteristics of wetlands that have influenced political decisions and social action over time. This work primarily draws from the published

literature on wetlands and wetland management in North America and Alberta, but also includes primary data collected from 34 semi-structured key-informant interviews conducted throughout Alberta between 2009 and 2010.

This chapter starts with an examination of wetland management through time, beginning with European settlement in the late 1800s and ending with a description of the current and unfolding wetland policy process. This examination includes the identification of five key historical periods, which are all marked by significant environmental, social, or political events that have had a lasting impact on wetland management in Alberta. The chapter concludes with a general discussion, recommendations, and conclusion.

2.2. The History of Wetland Conservation and Management in Alberta

2.2.1 A Time of Optimism: The Agrarian Settlement of Alberta

The contemporary management of wetlands in Alberta has been largely informed by a resourcist paradigm that has dominated the social and political culture of the province since settlement began in the late 1800s (Figure 2-1). From the earliest days of the agrarian settlement of the province, common law and statutes were designed to maximize agricultural production by granting secure access rights for water withdrawal or diversions, thus easily allowing for wetland drainage. At the same time, a great deal of uncertainty existed around the ownership and property rights of wetlands, with increasing conflicts arising between customary and legal management systems (Adger & Luttrell 2000).

One of the first examples of water law that was enacted for the benefit of the agricultural community was the *Northwest Irrigation Act* of 1894 (Table 2-1). This *Act* came in response to a growing irrigation movement in southern Alberta, and was spurred by concerns over common law riparian rights that restricted water use to landowners whose lands abutted a watercourse or water body (Percy 1993). In response to this restriction, the *Northwest Irrigation Act* was enacted, which amended riparian rights and vested property and water rights in the Crown, thus allowing the federal government to allocate rights to divert and use water to anyone who obtained a license. The ability of the federal government to provide secure water rights to license holders, regardless of whether their lands abutted a water body, encouraged agricultural settlement in southern Alberta. Between 1897 and

1905, approximately 40,000 homesteads were established, with the population in the region increasing from less than 75,000 people, to over half a million (Government of Alberta 2002). By 1920, with the assistance of various government programs, subsidies, and laws, agriculture had become the primary industry driving the provincial economy and irrigation was widespread throughout southern Alberta.

The economic success of the agricultural industry during the settlement of the province set in motion a period of dramatic wetland loss, as wetlands were regularly drained to maximize agricultural production. While the *Northwest Irrigation Act* technically regulated wetland drainage by requiring a license to divert water, the federal government lacked the capacity to enforce this law over their vast territory, and wetland drainage was likely seen as an economic imperative that did not warrant sanction for failing to obtain a license (Percy 1993). This lack of enforcement likely created conditions in which agricultural producers were unaware of the statutory requirement to obtain a license, contributing to a culture where wetland drainage was simply accepted as a regular part of life in rural Alberta (personal communication, senior provincial government employee, June 8, 2009).

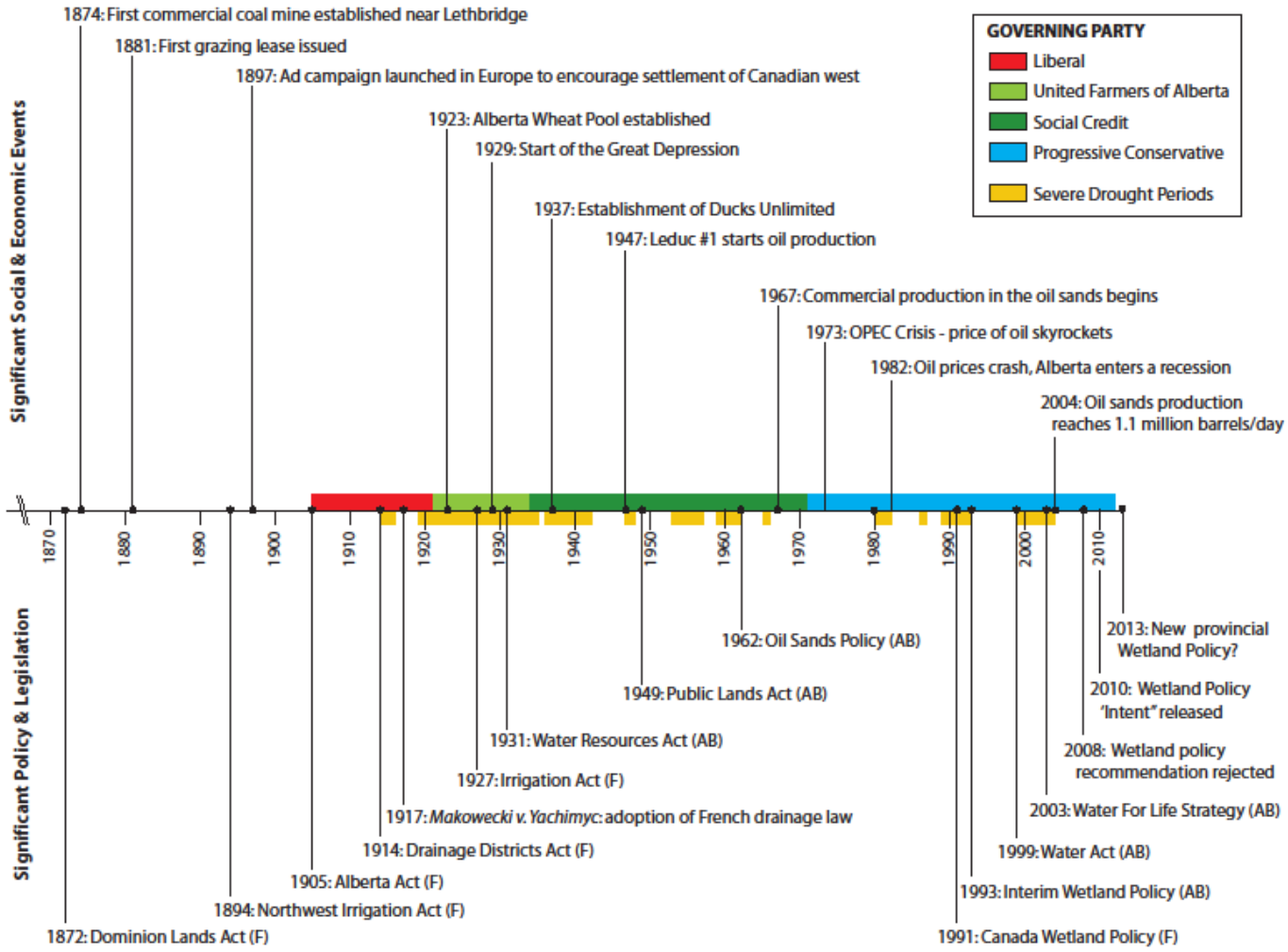

Figure 2-1. Abbreviated history of Alberta since the confederation of Canada, as it relates to natural resource development and water-policy and legislation. Severe drought periods were estimated using a 5-year Standardized Precipitation Index for the Canadian Prairies (Bonsal and Regier 2007).

Table 2-1. Federal and provincial legislation or court rulings that have significantly influenced wetland conservation and management in Alberta over the last 150 years.

Legislation or Ruling	Year	Description
Northwest Irrigation Act	1894	• Transferred property and interest in the bed and shore of "any lake, river, stream or other body of water" to the Crown and established licensing for water allocation that encourage irrigation works
Irrigation Districts Act	1914	• Allowed land owners to organize into local cooperatives for the construction of large irrigation projects
Makowecki v. Yachimyc	1917	• Resulted in a legal ruling that adopted civil law, which effectively allowed for the undisputed right of an upper land owner to drain naturally accumulated water through a channel onto lower landowner property without obstruction, thus encouraging more drainage of land than permitted under the common law
Drainage Districts Act	1921	• Created locally organized and governed drainage districts to oversee large-scale drainage projects
Alberta Natural Resources Act	1930	• Transferred federal control of public lands and natural resources to the province of Alberta, including the bed and shore of wetlands and other water bodies
Water Resources Act	1931	• Prohibited the use or diversion of any water vested in the Province without a license, with the exception of water diversions for "domestic purposes"
Canadian Wheat Board Act	1935	• Developed grain delivery quotas that were determined by the total cultivated land acreage, rather than volume of grain produced, creating incentives to cultivate marginal agricultural lands, such as wetlands
Public Lands Act	1984	• Amended after a court case to redefine a "water body" to include permanent water bodies only, which eliminated protection for ephemeral or seasonal wetlands
Income Tax Act	1970	• Provided tax incentives "for clearing land, leveling land or installing a land drainage system for the purpose of the business"[2]
Western Grain Stabilization Act	1976	• Provided production subsidies to grain producers, resulting in the cultivation of marginal lands that may not be profitable under market conditions
Water Act	1999	• Replaced the Water Resources Act and requires a permit for any activity that impacts a water body, including a wetland, with exemptions for "agricultural users" and "household purposes"

[2] *Income Tax Act* 1970, c.63, s.1 "30"

While wetland drainage was commonplace in Alberta, it was not without controversy, and often resulted in conflicts between landowners. The common law governing drainage at the time was not clear on how to resolve these conflicts, and the prevailing perception was that landowners had the right to drain casual surface water, provided that the upstream landowner did not deposit excess water onto neighbouring lands or into a watercourse (Percy 1993). This interpretation effectively limited large-scale drainage projects, given that such activities could not be undertaken without substantially affecting downstream landowners. This understanding of the drainage law in Alberta was challenged in court in 1917[3], which resulted in the adoption of the French civil law rule as it applied to drainage (Table 2-1). Under this rule, upper landowners had the undisputed right to drain naturally accumulated water into a channel, and the lower landowner was required to receive this drainage without obstruction, provided the natural flow in the channel did not increase to the detriment of the lower landowner. In practical terms, adoption of this rule allowed for more drainage than was permitted under common law, and created a judicial and statutory right to drain wetlands in Alberta (Percy 1993).

The economic incentive to drain wetlands to increase agricultural production was also manifest in the creation of drainage districts under the *Drainage Districts Act* of 1921. Under this legislation, a drainage work could be undertaken if at least two-thirds of landowners affected by the proposed work were amenable to the project. The passing of the *Drainage Districts Act* and the creation of nine drainage districts in Alberta, which are still in existence today, created a permissive legislative environment that incentivized large-scale drainage projects in Alberta.

Change to, and enactment of, various drainage laws in the early 1900s, coupled with the economic focus on agricultural production, has had a substantial impact on wetland loss in the central and southern regions of the province. Alberta is part of the Prairie Pothole Region (PPR), a 780,000 km^2 area stretching from Iowa to Alberta that is characterized by an abundance of depressional wetlands that were formed by glaciation during the Pleistocene period (Mitsch & Gosselink 2007). Dependent primarily on precipitation for hydrological inputs, these pothole

[3] *Makowecki v. Yachimyc* (1917), 10 ALR 366; 1 WWR (1917) 1279; 34 DLR (1917) 130 (ASC, App Div).

wetlands are subject to climate fluctuations that drive frequent wet-and-dry cycles, which results in exceptionally productive ecosystems that support between 50 and 75% of North America's waterfowl populations (Mitsch & Gosselink 2007).

Of the millions of wetlands that existed in the PPR prior to settlement, it is estimated that only 10% of the original wetlands remain today, with the majority of these losses attributed to agriculture (Mitsch & Gosselink 2007). While changes to the common law rule of drainage played a significant role in the loss of wetlands in Alberta, it can be argued that these changes to law were driven by the physical realities of the prairie pothole landscape. Water from heavy rains and melting snow remained on the landscape in abundance, particularly in the spring, and this abundance of water severely hindered agricultural production in an area where the federal and provincial governments created incentives to attract new ranchers and farmers to increase 'land productivity'. Thus, the adoption of many of the regulations and laws aimed at eliminating standing water on the landscape came as a direct response to the physical nature and abundance of wetlands in the region.

2.2.2 Climactic Reality Strikes: Technological & Political Response to Drought

While the first decade of settlement in the province was characterized by general optimism and rapid growth of the agricultural industry, the climatic realities of settling in a region prone to drought and dramatic climate variation began to take hold by 1914 (Marchildon et al. 2008). Between 1914 and 1938, a series of severe droughts affected the province and seriously threatened the livelihoods of many of the new settlers. The provincial and federal governments responded to the drought with institutional adaptations, including the creation of the Prairie Farm Rehabilitation Administration (PFRA) in 1935, and the Special Areas Board in 1938. While these institutions supported the relocation of farms and ranches to other areas of the province more suitable for agriculture, the primary focus of both organizations was to provide financial relief to farmers and their families to encourage them to remain on their lands (Marchildon et al. 2008). In addition, a great deal of effort was directed toward developing technological solutions to overcome drought conditions, such as the construction of extensive irrigation systems and dams. This institutional response, which was focused on prevailing over nature, both contributed to, and was an early result of, a staples economy that

prioritized large-scale agricultural production above small-scale agricultural practices that were less transformative of the environment.

The agrarian colonization and subsequent droughts of the early 1900s not only had a profound impact on how Albertans viewed and interacted with nature, but also significantly influenced the political landscape of the province (Figure 2-1). The provincial Liberal party, which had been in power since the establishment of the province in 1905, lost an election in 1921 to a newly established political party: the United Farmers of Alberta (Jones 2002; Marchildon et al. 2008). The victory of the United Farmers of Alberta set the course for more than 90 years of socially and fiscally conservative governments that have consistently focused on attracting capital investment for natural resource extraction to maximize economic growth. This political hegemony has resulted in the establishment of institutions that are rigid and slow to change, and has created a high degree of path dependency as a result of substantial investments that have been made to create and maintain existing institutional structures (Duit & Galaz 2008).

The political events of the 1920s contributed to a deep sense of alienation that existed amongst Albertans as a result of on-going conflicts and power struggles between the provincial and federal governments over control of the province's natural resources. Alberta joined Confederation in 1905, yet the federal government maintained authority over natural resources in the province until 1930, when the *Natural Resources Transfer Agreement* was signed. This transfer of power was significant, and then, as now, conferred considerable wealth of natural resources to the province, thus positioning Alberta to become a powerful economic force in the Confederation.

Following the signing of the *Natural Resources Transfer Agreement*, the provincial government enacted the *Water Resources Act* in 1931, which vested authority over all water within its borders to the government of Alberta, and created a requirement for a license to divert water, except in instances of water use for 'domestic purposes'. This exemption had major impacts on wetland habitats, as 'domestic purposes' were generally defined as unlimited use of water for the purposes of "human consumption, sanitation, fire prevention, and watering animals, gardens, lawns and trees" (Tkachuk 1993). Presumably, much of the water used for domestic purposes was either drained or diverted from wetlands, and uses such as

stock watering likely resulted in serious degradation of wetland habitat as a result of clearing or trampling of riparian and shoreline vegetation.

The *Water Resources Act* also authorized the Minister of the Environment to bypass the licensing process to permit water management projects, including drainage projects that utilized public funds or were part of a cost-sharing arrangement between the provincial government and local authorities (personal communication, Senior Provincial Government Employee, 2009). This permissive orientation towards exempting activities that directly or indirectly impacted a wetland reinforced the notion that these habitats were not worthy of protection, thereby contributing to the culture of non-compliance in instances where a license was required for work impacting a wetland.

In the late 1930s, after more than a decade of severe drought, the dominant public perception that wetlands were wastelands began to change. Anthropogenic wetland losses due to agriculture were compounded by loss due to drought, which contributed to massive declines in waterfowl populations across North America. In recognition of the need to maintain wetland habitats for waterfowl protection, Ducks Unlimited was established in 1937, followed by of Ducks Unlimited Canada in 1938. The establishment of these organizations signaled one of the first public awakenings to the idea that wetlands offered ecological goods and services that warranted protection (Nichol 2007). Despite the conservation efforts of Ducks Unlimited, wetland loss continued across the prairies and there was little change in the dominant perception that the best and highest use for wetlands was conversion to alternative land uses that maximized short-term profit for landowners.

2.2.3 Oil and Gas: A New Era of Resource Triumphalism

The political and economic focus on resource extraction in Alberta reached a new height in 1947, with the discovery of oil near Leduc. This discovery heralded in a new era of resource triumphalism in Alberta, and the provincial economy shifted from a reliance on agriculture to a focus on oil and gas production. Upstream oil and gas production quickly became the cornerstone of the Alberta economy, and by the 1970s, oil and gas was fueling both the provincial and Canadian economy. Rising oil prices turned international attention to the oil sand deposits in northern Alberta, as the capital investment required to develop this largely untapped resource was now within reach. In 1967, the Suncor project became the first oil sands operation in

Alberta, and was quickly followed by the Syncrude Project in 1973, which shipped its first barrel of oil in 1978 (Syncrude Canada Ltd 2012). To spur investment in the development of the oil sands, both the provincial and federal governments negotiated agreements with considerable concessions, including tax breaks, royalty holidays, a guaranteed rate of return on investment, and publicly financed infrastructure (e.g., roads) that encouraged and supported industrial development (Pratt 1977; Davidson & Gismondi 2011). These negotiations set the stage for future relations between the provincial government and private oil and gas interests, and began to shift the political power away from the agricultural sector towards the energy sector.

As the oil and gas industry grew in economic importance and influence, efforts to protect and conserve Alberta's wetlands were dealt another serious legal blow in the 1980s. Under the *Public Land Act* of 1949, the ownership of the bed and shore of "all rivers, streams, watercourses, lakes and other bodies of water" was vested in the Crown; however, the question of whether this public ownership extended to include wetlands was challenged in a 1983 Alberta Court of Queen's Bench case (*R*. v. *Very* 1983[4]). The final ruling was that wetlands (or "sloughs") were not included in the definition of "lakes", as a lake:

> "Is a body of water of considerable depth surrounded by a well-defined beach or bank and with a reasonably permanent nature where one can swim if the water is not too cold. On the other hand, a slough is a shallow body of dirty water usually full of weeds and insects or aquatic life where one would not consider swimming. Sometimes there is water present in the slough and sometimes there is not" (Percy 1993).

The judge went on to assert that wetlands are not considered waters as defined under the *Public Lands Act*, because:

> "A slough does not fall into the same genus or category [as rivers, streams, watercourses, or lakes] and is not included in that term as it does not have well defined banks, it dries up on occasion, and it is of no particular value to society other than, perhaps, for the seasonal watering of livestock." (Tkachuk 1993)

The judge went on to emphasize his own view of the value of wetlands by stating:

[4] R. v. Very (1983), 149 D.L.R. (3d) 688

> "Rivers, streams, watercourses and lakes all contain water which is of benefit or value to society as a whole for such purposes as fishing, navigation, or recreation. They are not considered to be 'nuisance waters' which may, in fact, have counter-productive effects on society, for instance, when they become breeding grounds for insects." (Tkachuk 1993)

This ruling directly resulted in a 1984 amendment to Section 3(1) of the *Public Lands Act,* which now states that the Crown has title to "the beds and shores of (a) any ***permanent*** and naturally occurring bodies of water, and (b) all naturally occurring rivers, streams, watercourses, and lakes"[5] [emphasis added]. This change effectively eliminated all protection previously afforded to ephemeral or semi-permanent wetlands under the *Public Lands Act*, and clearly illustrates how the negative social perceptions of wetlands have been reflected and enshrined in provincial law. Given that climate change and other natural and anthropogenic processes may lead to a transition of permanent wetlands towards seasonally flooded or ephemeral wetlands (Winter 2000; Johnson et al. 2005), the lack of protection for ephemeral wetlands under the *Public Lands Act* may have serious implications for the cumulative loss of wetlands in Alberta.

2.2.4 The Klein Years: The Rise of Neoliberalism in Alberta

Neoliberalism has been defined by Buscher and Dressler (2012 p. 367) as the "(re)fashioning of social and political dynamics in market terms", and the rise of neoliberalism globally has been characterized as operating in two distinct phases: the deregulation and dismantling of the state and the reregulation and 'roll-out' of state-sponsored neoliberal programs that support capitalist expansion (Peck & Tickell 2002; Buscher & Dressler 2012). In Alberta, the process of neoliberalization began in earnest during the 1990s, with the election of Ralph Klein as provincial Premier in 1993. Throughout his 14 years as premier, Ralph Klein oversaw the dismantling of government social programs, including massive cuts to education and health care funding, while at the same time, working with industry to put in place a royalty regime that encouraged unprecedented growth in the oil and gas industry (Davidson & Gismondi 2011).

Alongside his efforts to promote economic growth, Klein was also exceptionally skilled in his ability to reframe the public debate around environmental issues. Rather than allowing the spotlight to focus on the significant

[5] *Public Lands Act,* R.S.A. 2000, c P-40, §3(1)

environmental impacts of oil and gas development, Klein claimed that economic performance and job security were threatened by environmental regulation, thereby deflecting attention away from substantive environmental concerns related to a rapidly expanding oil and gas industry (Davidson & Gismondi 2011). The result was a decade and a half where natural resources were regulated within a government culture where economic development was the imperative, resulting in a more permissive political culture that favored capital investment and economic growth over environmental regulation (Urquhart 2005; Davidson & Gismondi 2011).

It was during the Klein years that the government of Alberta introduced a policy to direct the management of wetlands in the province. The 'interim' wetland policy, which was introduced in 1993, focused on the management of marsh wetland habitats in the White Area (Figure 2-2). The stated goal of the policy, which is still in place today, is to "sustain the social, economic, and environmental benefits that functioning wetlands provide, now and in the future" (Alberta Water Resources Commission 1993 p. 1). The framework for meeting this goal is to first avoid wetland habitats; second, to mitigate for the loss or degradation of unavoidable impacts as near to the site of impact; and third, to enhance, restore, or create wetland habitat in areas where they have been depleted or degraded. The policy states that "wetland management will be balanced to recognize that objectives for wetlands may conflict with objectives for other natural resources and all management objectives may not be met for every wetland", and that "land use activities that are compatible with wetlands will be permitted" (Alberta Water Resources Commission 1993 p. 3). These statements clearly indicate that wetland conservation would not be given first priority in land use decisions, but rather, would be 'balanced' with other considerations, such as draining and filling wetlands to achieve economic and social objectives.

In 1994, the government developed a 'draft' wetland policy for the Green Area, which was focused on the management of peatlands in northern Alberta (Rubec & Hanson 2008). While this draft policy was intended to complement the existing interim policy, it was never approved by Cabinet, and thus, has never been implemented. Consequently, the province has been left with an "interim" wetland

policy that applies exclusively to the settled region, and excludes approximately 60% of lands in the province.

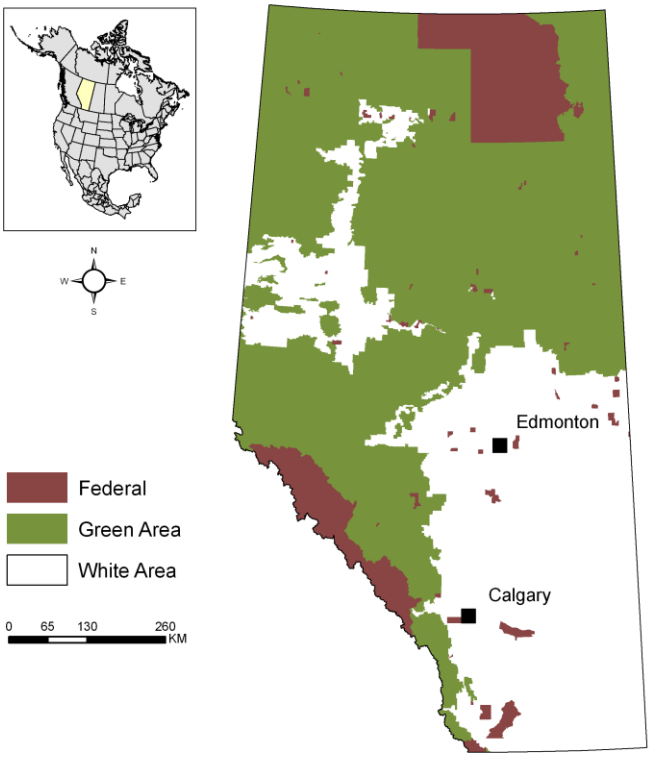

Figure 2-2. Land tenure in Alberta. The majority of historical wetland losses have occurred in the settled region (the "White Area") of the province. The "Green Area" covers approximately 60% of the province, is sparsely populated and is dominated by vast areas of peatland (bog and fen) habitats. The existing Interim wetland policy applies only to the White Area of the province.

While the province adopted the interim wetland policy in 1993, there was no accompanying legislation that could be used to enforce the goals of the policy. Consequently, very little progress was made towards wetland policy implementation until December of 1999, when the government replaced the *Water Resources Act* with the *Water Act*. This new legislation required a permit for any activities impacting a 'water body', which included wetlands (Alberta Environment 2001). As a result, the *Water Act* became the regulatory tool for enforcing the goals of the interim wetland policy.

With the introduction of the *Water Act*, the government required an approval for any project or activities that impacted, or had the potential to impact, a wetland. Like the proceeding *Water Resources Act*, however, the *Water Act* included

exemptions for agricultural water use of up to 6250 cubic meters per year[6], as well as exemptions for household water use of up to 1250 cubic meters per year[7]. These exemptions have functioned to create a great deal of confusion with respect to who holds wetland property rights. Even in instances where a landowner may be aware of their legal obligation to obtain an approval to drain or fill a wetland, many have reported inconsistencies in how the *Water Act* is applied, and a general reluctance by the government to enforce the *Water Act* in cases of illegal drainage (Clare et al. 2011). The failure of government to enforce regulations has led to questions about the fairness and legitimacy of the policy, with many people asserting that the government lacks any authority to direct wetland management decisions, particularly in light of the fact that the policy is still considered an 'interim' policy (personal communication, 2009).

2.2.5 Special Interest Politics: Developing a New Wetland Policy in Alberta

In 2003, after several years of severe drought, the Alberta government introduced the *Water for Life* strategy in an effort to help better manage water quality and supply in the province. In 2004, the government established the Alberta Water Council (AWC), a multi-stakeholder group that was delegated the task of monitoring the implementation of the *Water for Life* strategy. In June of 2005, the AWC struck the Wetland Policy Project Team (WPPT) - which consisted of 25-members representing industry, non-governmental organizations, and the regional and provincial government - to develop consensus-based recommendations for a new wetland policy and implementation plan. The deadline for delivering these recommendations to government was the fall of 2006, with a stated commitment by government to have a new wetland policy in place by 2007 (Government of Alberta 2003; Alberta Water Council 2005). Given the enormous task of bringing together the various disparate perspectives of the WPPT in a consensus-based process, the team quickly fell behind schedule in their efforts to fulfill their mandate.

In 2007, the WPPT undertook a public consultation process to help inform their work, which included workbook submissions and public workshops. Of the more than 800 Albertans who participated in the consultations, 90% of the workbook respondents and 86% of workshop participants strongly or somewhat

[6] *Water Act*, R.S.A. 2000, c. W-3, §19(1)
[7] *Water Act*, R.S.A. 2000, c. W-3, §1(1)x.

agreed that wetland conservation was important, even if conservation meant foregoing other land-use activities (Alberta Water Council Wetland Policy Project Team 2008). A further 90% of workbook respondents and workshop participants somewhat or strongly agreed that the goal of the new provincial wetland policy should be to maintain or increase wetland area (Alberta Water Council Wetland Policy Project Team 2008). The results of the public consultation overwhelmingly documented the strong desire of Albertans to have a new wetland policy that placed priority on the protection and conservation of wetlands in the province. By all accounts, this was a relatively clear insight, through an open and democratic process, into the public desire for a new wetland policy.

Following the public consultation, the WPPT submitted their policy recommendations to the Alberta Water Council Board of Directors in June of 2008. At that time, the Board deferred any decision until September of 2008, to allow members of the WPPT to ratify the documents within their sectors before taking the recommendations to the Alberta government. In July of 2008, the Alberta Chamber of Resources (ACR) and the Canadian Association of Petroleum Producers (CAPP), who represented the interests of the mining and the oil and gas industry on the Water Council, submitted letters of non-consensus. In their letters to the Water Council Board, the ARC and CAPP outlined several issues of concern, including an objection over what was perceived by industry to be an unfair financial burden associated with wetland compensation. As stated in the letter of non-consensus from CAPP (Canadian Association of Petroleum Producers 2008 p. 2):

> "The GOA [Government of Alberta] needs to recognize that the land base and monetary cost for compensating for wetland (mostly peatland) loss at the scale of oil sands mining projects will be substantial."

This view was echoed by ACR (Alberta Chamber of Resources 2008 p. 3):

> "There is a public perception that because the price of resource commodities is so high, resource development companies have more than enough money to bear the costs of reclamation by themselves. While it is the responsibility of companies to do their fair share of reclamation, the costs of implementing the proposed Wetland Policy could pose a significant financial barrier to investment."

It was suggested by the ACR that these costs, which were estimated to be between $170 million and $560 million, "would be reduced by allowing large mining

projects to replace less than a 1:1 ratio of wetlands – or in other words, to have 'a net loss of wetlands' for the projects" (Alberta Chamber of Resources 2008 p. 3). CAPP also supported this position, suggesting that the government allow a net loss of wetlands in the Green Area, provided that the losses were compensated for through the establishment of "alternate land uses" (e.g. forestry, upland wildlife habitat). Ultimately, both ACR and CAPP suggested revisions to the policy recommendations that would allow for a net loss of wetland area in northern Alberta, an area heavily impacted by in-situ and surface mining of bitumen.

This position by ACR and CAPP was in clear contrast to the strong support by the public for a new wetland policy (Alberta Water Council Wetland Policy Project Team 2008). Further, after almost three full years of negotiation and compromise by all members of the Wetland Policy Project Team, ACR and CAPP were the only members that did not fully support the new policy recommendations, and only formally expressed their objections in the final weeks preceding submission of the recommendations to government. This last-minute withdrawal of support for the policy recommendations was seen by many to be a tactic to co-opt a legitimate, publicly endorsed policy process that had the potential to constrain future opportunities for industrial development, and increase costs for business–as-usual operations (Personal communication, Wetland Policy Project Team member, 2009).

Despite the WPPT non-consensus, the Alberta Water Council forwarded the policy recommendations to government in September of 2008. Since that time, the Alberta government has been very slow to act on the implementation of a new wetland policy, despite their previously stated commitment to have a new policy in place by 2007. This delay is perceived as being related to efforts by government to create a new policy that will placate the oil and gas industry (The Canadian Press 2009; Water Matters 2009). This perception may be warranted, as the ACR recently claimed that:

> "The province has agreed to three of the four changes to the proposed wetlands policy that (the Alberta Chamber of Resources) requested in a letter of non-consensus delivered to the Ministry of the Environment." (Cotter 2010)

This claim of victory comes despite the fact that a new wetland policy has not been publically released. In response to this claim, Rob Renner, who was then the Minister of Environment, responded by saying "we [Alberta Environment] accept arguments that some have made. We take those arguments and we try and maintain that balance" (Cotter 2010).

The notion of 'balancing' economic development and the environment has been a prominent and consistent message from the provincial government, particularly with regard to environmental policy and the oil and gas industry. There is some question, however, as to how successful the government has been at achieving this balance, given the tension that often exists between environmental protection and economic development. Not only is the notion of balance paradoxical, but it also appears that business interests are often prioritized above wetland protection, as expressed in an interview with a senior government regulator who said:

> "The major economic drivers in this province right now, of course, are oil and gas, along with agriculture and forestry, and sometimes I think it's seen that wetlands, or conservation of wetlands, is an impediment to the development of our resources. So, there may be a lack of political will to move forward in a really direct way."

Moving forward with a new province-wide wetland policy will prove to be a significant challenge for the Government of Alberta if the goal is to 'balance' wetland protection with economic development. It is estimated that the boreal region of Alberta contains approximately 35% of the world's wetlands (Woynillowicz et al. 2005) and 15% of the world's proven oil reserves (Alberta Department of Energy 2007). Without question, the extraction and processing of these vast bitumen deposits is having, and will continue to have, profound impacts on wetlands at a regional, provincial, and global scale. Several policy actors, including the mining and oil and gas industries, have suggested that wetlands in the northern portion of the province can be lost provided that these losses are compensated for through restoration of wetlands in the southern portion of the province, where the majority of the historical losses have occurred (Alberta Chamber of Resources 2008).

This approach seems reasonable if the goal of the wetland policy is to simply ensure that wetland area in the province is maintained. What it lacks, however, is consideration of the larger social and environmental issues of relocating wetland

habitats across vast distances into different watersheds, and ignores completely the fact that restoration of a marsh wetland habitat in southern Alberta does not replace the lost function of a peatland in northern Alberta. Further, there is a general lack of scientific understanding regarding the threshold of wetlands that can be lost in northern Alberta before these losses result in a cascade of irreversible effects through ecological and social systems at various spatial scales.

The suggestion that extensive wetland losses in northern Alberta resulting from bitumen extraction can be compensated for by restoring wetlands in southern Alberta is also shortsighted when climate model projections for Alberta over the next 50 to 80 years are considered (Figure 2-3). These models suggest that the mean annual temperature in central and southern Alberta will rise by as much as 3°C, with an increase in average winter precipitation and a decrease in average summer precipitation (Flato et al. 2000). Climatic variables, particularly temperature and precipitation, drive wetland ecosystem structure and function, and thus have a strong influence on wetland habitats (Burkett & Kusler 2000). A decrease in annual summer precipitation, coupled with an increase in mean annual temperature, may result in increased rates of evapotransporation and decreased soil moisture, which is likely to result in a decrease in surface runoff and groundwater flowing into wetland habitats (Burkett & Kusler 2000; Mitsch & Gosselink 2007).

This type of scenario is not favourable for wetlands in southern Alberta, as the majority of the ephemeral and seasonal wetlands that currently exist in the region may be lost under such conditions, or wetlands may shift from one class (e.g. permanent) to another (e.g. semi-permanent). For example, Johnson et al. (2005) examined the potential effects of climate change on the Prairie Pothole Region and concluded that any increase in temperature, coupled with a decrease in precipitation, would result in significant wetland loss. Such changes may be beyond the limits of the adaptive capacity and tolerance of many of the species that rely on wetland habitats, thereby resulting in their extirpation or extinction (Burkett & Kusler 2000).

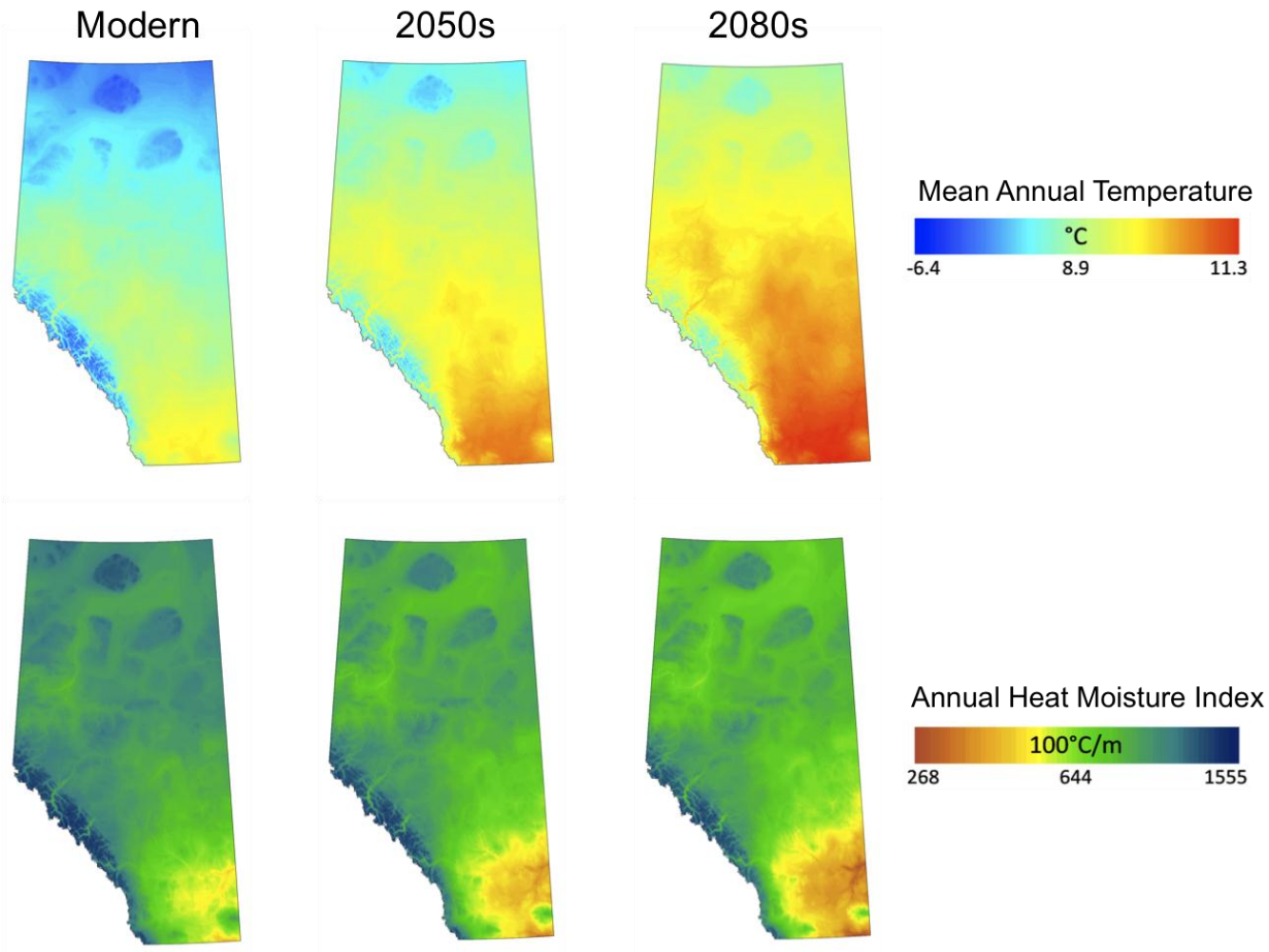

Figure 2-3. Mean annual temperature (MAT) and mean heat moisture index (MHMI) for Alberta for the modern period (1961 to 1990 climate normals) and projections for the 2050s and 2080s. The second version of the Coupled Global Climate Model (CGCM2) (Flato et al. 2000), A2 emissions scenario (IPCC 2001), was used to calculate MAT and AHMI, which are considered to represent "middle-ground" predictions for both climate and emissions. Annual heat moisture index was calculated as (Mean Annual Temperature + 10)/(Mean Annual Precipitation × 1000) (Wang et al. 2006).

2.3. Conclusions

The objective of this chapter was to follow an "event ecology" approach to identify the key ecological, social, and political events that have lead to the continued loss of wetlands in the province of Alberta. By taking this approach, one can begin to see how the notion of progress, as defined through land development and conversion practices wholly focused on the accumulation of economic wealth, has driven wetland loss in Alberta for more than a century. Through equating continued economic growth and progress with general human welfare, land conversions that destroy wetlands are justified by key industries that cultivate political support within the provincial government. The long history of conservative governments, and a continued reliance of these governments on maintaining a strong economy as a mechanism for maintaining political power, has resulted in complicit politicians who appear content to maintain the status quo, rather than concretely design policies to protect wetlands. By focusing the public discourse on a false notion of 'balance' between financial benefits and wetland loss, public attention has been diverted from the vulnerabilities and risks that wetland loss poses to ecological and social systems.

Alberta's historical focus on continued growth of a staples economy, coupled with a growing neoliberal approach to governance, has resulted in the development of symbolic environmental laws and policies, weak enforcement, and under-resourcing of government agencies responsible for environmental management. While there has been increasing international and local criticism leveled at environmental practices in Alberta, particularly in regards to oil sands development, the provincial government has successfully framed environmental issues as peripheral and secondary to maintaining economic growth, jobs, and asserting the province's right to manage its natural resources. Increasingly, the Alberta public is demanding that wetlands be protected and conserved; yet the Government of Alberta has been slow to respond. More than four years after the Alberta Water Council submitted its recommendations for a new wetland policy to government, the policy process continues to unfold in the province. Current signals suggest that despite a long and collaborative process by a wide range of stakeholders to develop recommendations for a wetland policy, business interests - and in particular the

interests of the oil and gas sector - have persuaded the Alberta government to seek weak rules that the majority of other policy actors view as inadequate..

Part of the pathway for change in how wetlands are perceived and regulated in Alberta is likely through greater public understanding of the critical importance of wetlands, attendant pressure on government for greater democratic debate around energy and land use policy, increased accountability for conservation and protection of wetland habitats (beyond talking about it), transparency about the state of wetlands (i.e., extent and condition) in the province, and a system of data collection and analysis that will allow for critical evaluation of wetland policy success. Increased awareness about the ecological and social benefits of wetlands, combined with periods of drought, floods, and other economic declines associated with peak oil and reduced agricultural productivity, may also provide human experiences and motivation that will challenge to the legitimacy of Alberta's resourcist paradigm.

2.4. Literature Cited

Adger, W., and C. Luttrell. 2000. Property rights and the utilization of wetlands. Ecological Economics 35:75–89.

Alberta Chamber of Resources. 2008. Letter to Gordon Edwards, Executive Director, Alberta Water Council.

Alberta Department of Energy. 2007. Alberta's Oil Sands 2006. Government of Alberta. Retrieved from http://www.energy.gov.ab.ca/OilSands/pdfs/osgenbrf.pdf.

Alberta Environment. 2001. Administrative Guide for Approvals to Protect Surface Water Bodies Under the Water Act. Queen's Printer, Edmonton, AB, Canada.

Alberta Water Council. 2005. Wetland Policy Project Team Terms of Reference. Edmonton, AB, Canada. Retrieved February 2010, from http://www.albertawatercouncil.ca/Portals/0/pdfs/WPPT%20ToR%20Final.pdf.

Alberta Water Council. 2008. Talking to Albertans About a new wetlands policy and implementation plan. Retrieved from http://www.awchome.ca/Portals/0/pdfs/WPPT%20Workbook.pdf.

Alberta Water Council Wetland Policy Project Team. 2008. Talking with Albertans about a new wetland policy and implementation plan: What we heard summary. Pages 1–16. Alberta Water Council, Edmonton, AB, Canada.

Alberta Water Resources Commission. 1993. Wetland management in the settled area of Alberta: an interim policy. Pages 1–18. Alberta Water Resources Commission, Edmonton, AB, Canada.

Bonsal, B. and M. Regier. 2007. Historical comparison of the 2001/2002 drought in the Canadian prairies. Climate Research 33(3): 229-242.

Boyd, D. 2003. Unnatural law: Rethinking Canadian environmental law and policy. UBC Press, Vancouver, BC, Canada.

Bridge, G. 2001. Resource triumphalism: postindustrial narratives of primary commodity production. Environment and Planning 33:2149–2173.

Bridge, G. 2009. Material Worlds: Natural Resources, Resource Geography and the Material Economy'. Geography Compass 3:1217–1244.

Burawoy, M. 2000. Global ethnography: Forces, connections and imaginations in a postmodern world. University of California Press, Berkeley, CA, USA.
Burkett, V., and J. Kusler. 2000. Climate change: potential impacts and interactions in wetlands of the United States. Journal of the American Water Resources Association 36.
Buscher, B., and W. Dressler. 2012. Commodity conservation. The restructuring of community conservation in South Africa and the Philippines. Geoforum 43:367–376. Elsevier.
Clare, S., N. Krogman, L. Foote, and N. Lemphers. 2011. Where is the avoidance in the implementation of wetland law and policy? Wetlands Ecology and Management 19:165–182.
Cotter, J. 2010. Alberta Chamber of Resources says Alberta to change wetlands plan. The Canadian Press. Retrieved from ProQuest database.
Davidson, D., and M. Gismondi. 2011. Challenging Legitimacy at the Precipice of Energy Calamity, 2011th edition. Springer.
Duit, A., and V. Galaz. 2008. Governance and Complexity—Emerging Issues for Governance Theory. Governance: An International Journal of Policy, Administration, and Institutions 21:311–335.
Flato, G. M., G. Boer, W. Lee, N. McFarlane, D. Ramsden, M. Reader, and A. Weaver. 2000. The Canadian Centre for Climate Modelling and Analysis global coupled model and its climate. Climate Dynamics 16:451–467.
Government of Alberta. 2002. Agriculture in Alberta: The History of Agriculture in Alberta. Government of Alberta. Retrieved June 22, 2012, from http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex2.
Government of Alberta. 2003. Water For Life: Alberta's Strategy for Sustainability. Edmonton, AB, Canada.
Hessing, M., M. Howlett, and T. Summerville. 2005. Canadian natural resource and environmental policy: Political economy and public policy. UBC Press, Vancouver, BC, Canada.
Johnson, W., B. Millett, T. Gilmanov, R. Voldseth, G. Guntenspergen, and D. Naugle. 2005. Vulnerability of northern prairie wetlands to climate change. Bioscience 55:863–872.
Jones, D. 2002. Empire of Dust: Settling and Abandoning the Prairie Dry Belt. University of Calgary Press, Calgary, AB, Canada.
Marchildon, G. P., S. Kulshreshtha, E. Wheaton, and D. Sauchyn. 2008. Drought and institutional adaptation in the Great Plains of Alberta and Saskatchewan, 1914–1939. Natural Hazards 45:391–411.
Marcus, G. E. 1995. Ethnography in/of the world system: the emergence of multi-sited ethnography. Annual Review of Anthropology:95–117.
Millennium Ecosystem Assessment. 2005. Ecosystems and Human Well-being: Wetlands and Water Synthesis. World Resources Institute, Washington, DC, USA.
Mitsch, W., and J. Gosselink. 2007. Wetlands, 4th edition. John Wiley & Sons, Inc., Hoboken, NJ, USA.
Nichol, B. 2007. Ducks Unlimited turns 70. Ducks Unlimited Canada. Retrieved March 19 2010, from http://www.ducks.org/DU_Magazine/DUMagazineJanFeb2007/2973/DUTurns70.html.
Peck, J., and A. Tickell. 2002. Neoliberalizing space. Antipode 34:380–404.
Percy, D. 1993. Wetlands and the Law in the Prairie Provinces of Canada. Environmental Law Center, Edmonton, AB, Canada.
Pratt, L. 1977. The state and province building: Alberta's development strategy. in L. Panitch, editor. The Canadian State: Political Economy and Political Power. University of Toronto, Toronto, ON, Canada.
Rubec, C. D. A., and A. R. Hanson. 2008. Wetland mitigation and compensation: Canadian experience. Wetlands Ecology and Management 17:3–14.
Syncrude Canada Ltd. 2012. Unlocking the potential of the oil sands: Oil sands history. Syncrude Canada Ltd. Retrieved July 4, 2012, from http://www.syncrude.ca/users/folder.asp?FolderID=5657.

The Canadian Press. 2009. Activists criticize Alberta for wetland policy delay. CBC News. Retrieved from http://www.cbc.ca/news/technology/story/2009/11/22/edmonton-water-management-wetlands-policy.html.
Timoney, K. and P. Lee. 2001. Environmental management in resource-rich Alberta, Canada: first world jurisdiction, third world analogue? Journal of Environmental Management 63: 387–405.
Tkachuk, D. 1993. Alberta's wetlands: Legal incentives and obstacles to their conservation. Page 33. Canadian Institute of Resources Law, Calgary, AB, Canada.
Urquhart, I. 2005. Alberta's land, water, and air: Any reason not to despair? in T. Harrison, editor. The Return of the Trojan Horse: Alberta and the New World (Dis)Order. Black Rose Books, Montreal, QC, Canada.
Vayda, A., and B. Walters. 1999. Against Political Ecology. Human Ecology 27:167–179.
Wang, T., A. Hamann, D. L. Spittlehouse, and S. N. Aitken. 2006. Development of scale-free climate data for Western Canada for use in resource management. International Journal of Climatology 26:383–397.
Water Matters. 2009, December. Another delay for the wetlands policy. Retrieved March 2010, from http://www.water-matters.org/story/342.
Winter, T. 2000. The vulnerability of wetlands to climate change: A hydrologic landscape perspective. Journal of the American Water Resources Association 36:305–311.
Worldwatch Institute. 2001. Vital signs 2001: The Trends that are Shaping our Future. W.W. Norton & Company, Inc, New York, NY, USA.
Woynillowicz, D., C. Severson-Baker, and M. Reynolds. 2005. Oil sands fever: the environmental implications of Canada's oil sands rush. Page 76. The Pembina Institute, Drayton Valley, AB, Canada.

CHAPTER 3

Where is the Avoidance in the Implementation of Wetland Law and Policy?[8]

3.1. Introduction

Many jurisdictions in North America use a 'mitigation sequence' to protect wetlands: First, avoid impacts; second, minimize unavoidable impacts; and third, compensate for irreducible impacts through the use of wetland restoration, enhancement, creation, or protection. Despite the continued reliance on this sequence in wetland decision making, there is broad agreement among scholars, scientists, policymakers, regulators, and the regulated community that the first and most important step in the mitigation sequence, avoidance, is ignored more often than it is implemented (Burgin 2008; Environmental Law Institute 2009; Hough & Robertson 2009; Murphy et al. 2009a). While many studies have shown that compensatory laws and policies have not been effective in maintaining wetland area and function (Roberts 1993; Zedler 1996; Malakoff 1998; Cole & Shafer 2002; Spieles 2005; Hough & Robertson 2009), and often have unintended social impacts

[8] *A version of this chapter has been published. Clare, Krogman, Foote and Lemphers. 2011. Wetland Ecology and Management. 19(2): 165-182*

(Ruhl & Salzman 2006; Bendor et al. 2007; 2008; Burgin 2008; Hough & Robertson 2009; Murphy et al. 2009a), few explicate *why* these laws and policies have failed, or suggest alternative approaches to regulating and managing wetland impacts.

Toward that end, the key objective of this chapter is to summarize research explaining why wetland avoidance is commonly overlooked in the permitting process, and to advance what are considered to be key policy modifications or alternatives to incentivize wetland avoidance as a workable alternative to compensation. By critically examining factors that influence wetland permitting decisions, improvements can be made to wetland law, regulation, and policy such that losses can be prevented, rather than following the heretofore pattern of permitting losses and hoping that compensation will replace lost wetland area, values, and functions.

While there are many countries worldwide that have made strides in wetland regulation, the examination of existing wetland law, regulation, and policy has been limited to the United States and Canada, and specifically, to the province of Alberta. As carried out in other environmental policy and conservation strategy evaluation studies (Brooks et al. 2006a; Lovell & Sullivan 2006; Reed 2008), a web-based search of wetland management literature from peer-reviewed sources and widely available grey literature published between 1989 and 2010 was conducted using ISI Web of Knowledge, JSTOR, Web of Science, and Google Scholar. Keyword search terms included: wetland, plan, success, assessment, avoidance, and compensation. This work was also informed by 33 semi-structured, key-informant interviews conducted in Alberta between 2009 and 2010. Key informants were asked questions about the effectiveness of the existing wetland policy and the sample consisted of regulators, agency decision makers, scientists, industry representatives, and consultants who were intimately familiar with the policy. This sociological methodological approach has been applied previously in the evaluation of wetland policy implementation in Louisiana (Krogman 1999). Interviews were conducted until saturation was reached, i.e., no new arguments were advanced among respondents (Krogman 1996), and all interviews were recorded, transcribed, and coded across themes using the qualitative data analysis software program NVIVO (QSR International Pty Ltd. 2008).

3.2. Background: Wetland Regulatory Context

3.2.1 United States

Wetland regulation has a long and complex history in the United States, going back to 1972 and the introduction of Section 404 of the Federal Water Pollution Control Act (more commonly known as the Clean Water Act). The principal intent of the Act was to "restore and maintain the biological, chemical, and physical integrity of the Nation's waters" in part through the establishment of the Section 404 permitting program. This regulatory process requires that an Individual Permit be issued for any activity that results in the discharge of dredged or fill materials into waters of the United States, including wetlands (Chertok & Sinding 2005; Williams & Connolly 2005; Hough & Robertson 2009). Both the Army Corps of Engineers (the Corps) and the Environmental Protection Agency (EPA) were given jurisdiction over the permit program, with the Corps being responsible for overseeing day-to-day permitting activities, and the EPA being given authority ("in conjunction with" the Corps) to develop guidelines for permit approvals, as well as the authority to override any permit approval issued by the Corps (Ellis 2005).

In 1977, amendments were made to the Clean Water Act that allowed the Corps to issue General Permits for activities that resulted in "only minimal adverse environmental harm"[9]. These General Permits lacked the more rigorous environmental oversight of Individual Permits (Taylor & Geoffroy 2005; Hough & Robertson 2009), and clearly signaled that the goal of restoring and maintaining the integrity of wetlands was not going to be achieved by simply denying permits and avoiding impacts. Consequently, other regulatory and policy mechanisms began to emerge, and the concept of "mitigating" the damage to wetlands through impact minimization or compensation began to gain traction as an alternative to wetland avoidance (Kruczynski 1990; Hough & Robertson 2009).

In 1980, the Section 404(b)(1) Guidelines were released, putting new restrictions on the discharge of dredged and fill materials and formalizing the concept of "sequencing" wetland permit decision making. Under Section 230.10 (a-d) of the Guidelines, a permittee must demonstrate that there is no other available, feasible, or environmentally preferable alternative to the proposed project: the so-called least environmentally damaging practicable alternative (LEDPA) analysis

[9] 33 U.S.C. Section 1344 (e)(1) (2000)

(Pifher 2005). While these regulations formally prioritize wetland avoidance over impact minimization and compensation, permittees can argue that there are no other "practicable alternatives" to the proposed project by citing limitations presented by factors such as land ownership and availability, geographic scope, economic viability, logistics, and/or technological feasibility (Pifher 2005). Further, permittees can define their overall project purpose in a way that effectively makes alternatives to wetland loss impracticable; they can also argue that their project is "water dependent", or that alternative sites would result in less desirable environmental outcomes (Pifher 2005; Hough & Robertson 2009). The Corps and the EPA have also acknowledged that there is a need for "flexibility" in the application of the alternatives analysis, given that impacts to wetlands may vary in their extent, severity, and duration (Pifher 2005). Combined, these factors have led to a general failure by both the Corps and EPA to strictly enforce the mitigation sequence as written in the 404(b)(1) Guidelines, and have arguably contributed to the creation of a regulatory culture where "mitigation" and "compensation" are generally seen as being one and the same (Hough & Robertson 2009).

The reliance on compensation over avoidance as a mechanism for achieving wetland management goals was reinforced in 1989, with the adoption of the "no net loss" policy by the Bush administration. While many felt that this new policy elevated the issue of wetland loss in the national consciousness, there was also a recognition that the no net loss goal "was not merely to be achieved through the denial of permits, or even the avoidance and minimization of impacts, but rather through allowing impacts and requiring compensation" (Hough & Robertson 2009 p. 26). As the use of wetland compensation grew throughout the 1990s, there was mounting pressure from industry to move away from on-site and in-kind wetland mitigation, and towards the use of wetland mitigation banking as a market mechanism that would allow for the increasing use of off-site compensation (Salzman & Ruhl 2005; Ruhl et al. 2009). This approach to wetland compensation was seen by government agencies to "ensure wetlands conservation at minimum economic and political cost" (Salzman & Ruhl 2005 p. 2), and by 2005 wetland banking had grown to account for as much as 30% of all mitigation being carried out in the US (Wilkinson & Thompson 2006). The increasing use of wetland banking as a form of permittee-responsible mitigation drove the need for clearer and more

consistent standards and procedures. As a result, the Corps and the EPA jointly issued new rules for wetland mitigation in April of 2008. Though designed to improve compensation outcomes by creating clear performance standards and administrative procedures, concerns have emerged that the procedures outlined in the new rule will become yet another regulatory mechanism that further institutionalizes the use of compensation over avoidance (Stokstad 2008). Given that less than one percent of permits in the US are denied by the Corps (Murphy et al. 2009b), and the general assumption by proponents that they will not be denied a permit (Nichols 2008), it seems apparent that compensation, over avoidance or minimization, has become the preferred mechanism by which to achieve the goal of no net loss in the United States (Kruczynski 1990; Race & Fonseca 1996; Hough & Robertson 2009).

3.2.2 Alberta, Canada

Wetland management and regulation in Canada has a much shorter history than that of the United States, and wetland policy in many Canadian jurisdictions is either non-existent or is in early stages of development (Rubec & Hanson 2008). One exception to this is Alberta, where the trajectory of wetland policy can be said to resemble that of the United States, particularly with respect the growing trend towards the use of compensation over avoidance as a mechanism to meet wetlands policy goals.

In 1993, Alberta introduced a regional wetland policy that primarily applied to marsh wetlands in the settled areas of the province. While the stated policy goal is to "sustain the social, economic, and environmental benefits that functioning wetlands provide, now and in the future" (Alberta Water Resources Commission 1993), the implementation of the policy has focused on achieving a no net loss of wetland area through conserving wetlands in a natural state, mitigating the degradation or loss as close to the site as possible, and enhancing, restoring, or creating wetlands in areas where they have been depleted or degraded (Alberta Water Resources Commission 1993; Rubec & Hanson 2008). While Alberta was one of the first provinces in Canada to adopt a wetland policy, very little progress was made with respect to implementation of the policy until December of 1999, when the outdated Water Resources Act was replaced by the Water Act. This new legislation shifted the focus away from solely regulating the allocation of water, and

instead included a more comprehensive purpose for supporting and promoting the "conservation and management of water, including the wise allocation and use of water"[10]. Under the Act, any activity that "causes, may cause or may become capable of causing an effect on the aquatic environment"[11] requires an approval, and in making a decision about granting an approval, the government "may consider any existing, potential or cumulative effects on the aquatic environment"[12]. Notwithstanding this more conservation-oriented language, the Purpose of the Act also specifies that decisions about the management of water resources must also recognize "the need for Alberta's economic growth and prosperity"[13].

As in the United States, the mitigation sequence has been used to help inform and direct wetland decision making in Alberta, and outcomes have been similar with respect to a pervasive tendency to skip over any serious consideration of wetland avoidance, and to instead move immediately to compensation for wetland loss. One of the most significant differences between these jurisdictions in their approach to wetland regulation, however, is that Alberta has no equivalent process to the alternatives analysis, and no formal process for defining the basic project purpose. Once a proponent enters the permitting process, there is often very little consideration given to whether there are alternatives to the proposed project location, as expressed by one government approval writer who said:

> What we found is that avoidance just doesn't seem to be an option for most of [the permit applicants] out there. They've already planned their project; they know what they want to do. It's very difficult to work around that. (Approval writer, personal communication, June 2009)

In fact, many policy actors in Alberta feel that wetland avoidance is simply not a practical option in light of other considerations, such as economic development. There is often an acceptance that there is no alternative to filling the wetland and simply compensating for the loss, as summarized by another government approval writer who said:

> We would want you to avoid the impact whenever and wherever possible, but there is a realization that it's not practical and development will occur,

[10] Water Act, R.S.A. 2000, c. W-3, §2
[11] Water Act, R.S.A. 2000, c. W-3, §1(1)(b)(i)(D)
[12] Water Act, R.S.A. 2000, c. W-3, §38(2)(b)(i)
[13] Water Act, R.S.A. 2000, c. W-3, §2(b)

> and so then we have to go to minimize, mitigate, and compensate. (Approval writer, personal communication, August 2009)

The general failure to avoid wetland impacts in both the US and in Alberta, despite this preference being stated in regulation and policy, has led to an overall decline in the number and quality of natural wetlands in many jurisdictions across North America (Zedler & Kercher 2005; Walters & Shrubsole 2005; Dahl & Watmough 2007). It has also spurred a lively debate over whether the mitigation sequence of avoid, minimize, and compensate is an effective approach for managing wetland habitats within a no net loss framework. For example, Burgin (2010) suggests that "the outcome for wetland mitigation may not be an 'unmitigated disaster' but it is, at best, modestly successful" (p. 53), and Murphy et al. (2009b) go so far as to say that "mitigation activities continue what can only be described as a 'cockeyed optimist' approach to aquatic resources permitting – one that is destined to lead to further deterioration of the nation's aquatic resource base" (p. 3112). Given that many jurisdictions have adopted the mitigation sequence as a means to achieve a no net loss of wetlands, it is critical that we begin to better understand the key factors that lead to the pervasive tendency to skip-over avoidance.

3.3. Key Failures in the Avoidance of Wetlands

Five key factors emerged from the literature, and were supported by interview data, as being central to the failure of decision makers to prioritize wetland avoidance and minimization above compensation in the mitigation sequence:

1) A lack of agreement on what constitutes "avoidance";
2) Current approaches to land use planning do not identify and prioritize wetlands in advance of development;
3) Wetlands are economically undervalued;
4) A "techno-arrogance" is associated with wetland creation and restoration, resulting in increased wetland loss;
5) Requirements for compensation are inadequately enforced.

3.3.1 A Lack of Agreement on What Constitutes "Avoidance"

Foremost on the list of problems associated with the wetland mitigation sequence is the absence of a clear understanding on what constitutes "avoidance", and a lack of standardized methods or guidelines for evaluating or interpreting this regulatory requirement (Yocom et al. 1989; Environmental Law Institute 2009). While the regulatory understanding around wetland mitigation in the US has historically included a sequencing of "avoid, minimize, and compensate", these words were never expressly written into US regulation until the Final Rule on Compensatory Mitigation for Losses of Aquatic Resources was issued in April of 2008. Prior to this regulation, the concept of wetland mitigation was only vaguely defined as a sequence of decisions that make up the alternatives analysis, which was further clarified in a Memorandum of Agreement between the Corps and the EPA in 1990. A critical component of the alternatives analysis is how the proponent has defined the basic project purpose, and whether the regulator accepts the project purpose as presented. While the regulator is not obligated to accept the basic project purpose as proposed by the permittee, this step alone has the potential to foreclose on any opportunity to avoid wetland impacts; if the purpose has been too narrowly defined, alternatives may be considered impracticable (Pifher 2005). The language that allows compensation if avoidance or minimization "is not practicable" becomes a *de facto* loophole in its non-specificity, allowing developers to skirt the intent of the law and move directly to compensation. Given that there is no rigorous and repeatable process under which to consider "practicability" (Murphy et al. 2009a), the availability of options other than avoidance, such as compensation, are too easily considered by regulators. For example, in the US, Krogman (1999) found that administrative momentum, or the implicit assumption that regulators need to find a way to make it *work for the applicant*, makes asking the permit applicant to consider other sites for development seemingly unreasonable.

Once there is agreement on the basic project purpose and the proponent has demonstrated there is no other practicable alternative in terms of project location, there is still a requirement under Section 230.10 of the 404(b)(1) Guidelines to make the on-site impacts to the wetland as small and innocuous as possible, including giving consideration to how the project can be designed to avoid or minimize impacts (Hough & Robertson 2009). In this step there is additional

confusion over the meaning of avoidance; to some regulators on-site avoidance means preventing direct impacts, such as placing fill material directly into a wetland. To other regulators, "an attempt constitutes avoidance" (Environmental Law Institute 2009 p.3), meaning that any effort to modify a project – regardless of whether the project ultimately results in a direct impact – is considered avoidance. The language around the "minimization" of wetland impacts is also sufficiently vague, and in many cases, avoidance and minimization are lumped together such that "any measures to reduce impacts usually are applied to satisfy both requirements" (Environmental Law Institute 2009 p.6).

Given that Alberta does not have a formal process to examine alternatives to the project location, most of the consideration for avoidance and minimization is given to project design, and many regulators have indicated that they lack clear guidance on when to deny permits on the grounds that the applicant has not demonstrated wetland avoidance on-site. This concern was expressed by one wetland approval writer who commented:

> [The mitigation sequence] is more of a mechanism for enabling [wetlands] to be disturbed. We don't really have a good mechanism of saying, 'When should we say no?' If you have a sensitive vegetation species, should we be saying no? If there's sensitive wildlife, should it be no? We don't have clear guidelines on that. (Approval writer, personal communication, August 2009)

Given the lack of clarity around what constitutes avoidance and minimization, in addition to an absence of clear standards or guidelines, wetland permit decisions in both the US and Alberta are subject to a high degree of subjective interpretation by regulators. This ambiguity leads to an approval process that is characterized by inconsistent decision making and uncertainty within and between jurisdictions (Environmental Law Institute 2009). In Alberta, one regulator is quoted as saying:

> Consistency is an issue…and personally, I think it looks bad in the department. We should [have] a standard approach. Maybe you have different flavors from different offices, but the requirement…and the expectations should be the same across the board (Approval writer, personal communication, August 2009)

Some government agencies also consider their role to be about managing for development, rather than conserving or protecting wetland resources (Krogman

1996; 1999). For example, one regulator from the United States was quoted as saying, "Let's be real, this is not a prevention program, it is a regulatory program" (Environmental Law Institute 2009 p. 3). Such attitudes lead to more permissive application processes where regulators rarely deny approvals (Hough & Robertson 2009; Murphy et al. 2009b), but rather work together with applicants to achieve the applicant's desired outcome. For instance, one wetland approval writer in Alberta said:

> Well, there's always the ability to say no. Do we say no very often? Not really. What we try to achieve is the best outcome. (Approval writer, personal communication, June 2009)

In most cases, the "best outcome" does not include the avoidance of wetland impacts, but rather, approval of development plans and permit conditions that are palatable and acceptable to the applicant, which most often includes wetland compensation (Nichols 2008).

3.3.2 Poor Planning in Advance of Development

Failure to identify, recognize, and specifically designate wetlands or wetland communities that should be prioritized for conservation, protection, or restoration enables continued incremental losses of wetland area and function at both local and regional scales (Brody & Highfield 2005). Indeed, LaPeyre et al. (2001) found that states with a wetland management plan understand their resources and relevant actions for management better than states lacking a wetland management plan. More comprehensive land use planning that identifies high priority wetlands would allow land managers, developers, and individual land-holders to make more informed decisions about land acquisition, and gives them the ability to weigh the potential benefits and costs associated with development. Designating ecologically significant wetlands in advance of development would allow for the avoidance of high priority sites, thereby connecting larger regional management goals (and ecological function), with site-by-site permitting decisions. Brody & Highfield (2005) argue, for example:

> A clear understanding of the adverse impacts caused by urban development and resource degradation can assist planners in mitigating loss of ecosystem structure and function. When incorporated into a planning process and final plan, this information communicates the importance of protecting wetland function and integrity at the watershed level (p. 173).

From the perspective of land developers, better regional planning and prioritization of high-value wetlands provides increased certainty and decreases risks associated with the existing permitting process. For example, a senior executive in a land development company in Alberta indicated that improved watershed planning would be an additional tool that could be used to help evaluate future projects, and:

> If there [are] areas of wetlands that are significant, well then if we know that up front, we wouldn't go out and purchase them and try to develop them. (Sr. Executive, Land Development Company, personal communication, June 2009)

This sentiment was echoed by a government employee who said:

> I think the [wetland protection and conservation] debate needs to be taken up to a land use discussion to talk about what areas of wetlands do we want to preserve? Where should we keep them, where should we not? Where is it okay to develop, where is it not? It's a broader context, and I find that our [wetland approval] process tends to get leveraged a little bit in those discussions. (Approval writer, personal communication, August 2009)

Despite the existence of available technologies to assist in the prioritization of wetlands for protection, such as GIS-based synoptic land cover maps, rapid ground-based assessments, and intensive field assessments (Brooks et al. 2004), many land use planners do not prioritize significant wetlands or wetland communities. The failure to prioritize is often due to limited wetland mapping, inadequate wetland assessment methodologies, and poor linkages between wetland management actions and outcomes (LaPeyre et al. 2001). The result is that rare, unique, or high-value wetlands are treated with the same regard as common or low-quality wetlands, and few barriers to their loss have been brought to bear, thereby contributing to persistent and incremental losses of wetlands. Murphy et al. (2009a) concur, suggesting that even new and stricter rules that favor wetland avoidance in the United States "allow for a project-by-project analysis of mitigation that need not look at the entire watershed and its needs" (p. 15).

Ambiguous and competing goals within and between government agencies can also contribute to the lack of prioritization and planning in wetland regulation and management at various scales. Without clear goals for maintaining wetland ecosystem function or protecting wetlands that are highly valued socially, simple

rules of minimizing harm and trading-off one wetland for another has become the norm (Ehrenfeld 2000; Mann & Goldman-Carter 2008). An Alberta example of this problem shows that land use planning and regulatory decisions are made at different scales by multiple governments and agencies, including: municipalities for land-use zoning and bylaws; Alberta Energy for mineral rights; Alberta Sustainable Resource Development for forest resources and public lands; Alberta Environment for water and air; and Fisheries and Oceans Canada for fish and fish habitat. To further complicate matters, wetland policy implementation varies between the white zone (the southern one third of the province that is mostly private land and dominated by agricultural land use) where wetland impacts are regulated by an interim wetland policy, and the green zone (the northern two thirds of province comprised primarily of publicly owned forested lands) where the interim policy does not currently apply. This fragmentation of decision making and general failure to better integrate planning at multiple scales has contributed to the ineffectiveness of the wetland policy in Alberta.

Divergent goals for wetland management can also occur between regulators and restoration service providers (Environmental Law Institute 2006). In this case, the intention of (or task assigned to) the restoration service provider is to meet a specified goal or set of minimum criteria to ensure, for example, a no net loss of wetland area, even if the compensatory wetland is not of the same replacement value as the wetland that was lost. Indeed, many in-lieu fee programs in both Alberta (personal communication, August 2009) and the US (Environmental Law Institute 2006) allow restoration service providers to accept wetland compensation funds before mitigation sites are even identified or secured. There are also concerns in Alberta that without more coordinated planning, wetlands that have been restored or avoided will remain vulnerable to future incursions, particularly in areas where adjacent land values rise substantially, as they have in the more urbanized southern portion of the province and in northeastern Alberta where oil sands production is the dominant industry.

Reconciling this pluralism of goals at multiple scales of planning is a significant challenge in the management of wetlands across jurisdictions, and has been described by Huppes & Midden (1991) as a great social dilemma in wetland policy. Finding a balance between site-specific decision making that focuses on the

management of a single wetland, versus adopting a broader and more regional approach to wetland permit decisions, requires a fundamental (and likely structural) change in how wetlands are regulated. As Huppes & Midden (1991) suggest, "it is not so much individual projects that have to be improved, on an ad-hoc basis, but the overall development strategy" (p. 204); thus, the current approach in the US and Alberta of simply focusing on wetland impacts, permitting, and compensation at the project-level needs to be re-evaluated. Providing more clarity around the most appropriate scale (or scales) at which the alternatives analysis, and thus avoidance, should be applied would go a long way in resolving some of these issues in the US. In Alberta, the introduction of regulation that requires both a site-specific and a regional evaluation of impacts would contribute towards a more ecologically relevant approach to wetland management.

As a caveat, land use planning at the watershed level is not an answer in and of itself for integrating broader wetland values into permitting decisions. Throughout the land use planning literature are examples of plans and policies that have been adopted with little or no attempt to measure progress toward achieving stated goals and objectives (Baer 1997; Seasons 2003; Wenig 2006). Brody & Highfield (2005) summarized a host of studies and concluded that far more effort is put into planning than is accorded to the details of implementation. Similarly, in Alberta, there have been a number of elaborate land use planning efforts that have not resulted in measurable land use changes, such as new regulations and prioritized land uses (Wenig 2006; Fluett & Krogman 2008). Following through with effective implementation of land use planning and wetland prioritization is as important as the process of planning itself, and requires sufficient allocation of resources (e.g. financial and personnel) to be successful.

3.3.3 Wetlands are Economically Undervalued

The inexorable demand for developable land has resulted in the emergence of market-based mechanisms that have re-focused the discussion away from avoiding and minimizing wetland impacts, towards a more permissive orientation that allows for the "exchange" of wetland area or function between impact and compensation sites. The emergence of wetland banking and in-lieu fee payments has, in part, been driven by the perception that wetland avoidance in areas of economic conflict, such as residential subdivisions, is impracticable because the

"assumed" value of wetlands is often much lower than the more immediate and tangible wealth generated by development. While accounting tools for ecosystem services do exist, they are complex (Moeltner & Woodward 2009) and are employed by relatively few specialized resource economists; consequently, the substantial economic value that flows from wetlands in the form of ecosystem goods and services (Mitsch & Wilson 1996; Turner et al. 2000; Boyer & Polasky 2004; Birol & Cox 2007; Costanza et al. 2008; Moeltner & Woodward 2009) is rarely considered in the permitting process.

Increasingly, off-site wetland exchanges are favoured by permittees because they are seen as being faster, easier, and more cost-effective than avoidance. The use of off-site compensation mechanisms also allows land developers to pass on the liability for meeting permit conditions for compensation to a third party, such as a wetland broker or restoration agency. It is for these reasons that the use of in-lieu fee payments in Alberta has increased substantially over the last five years, as articulated by one government regulator who said:

> You really have to dig at the avoidance and mitigation piece…a lot of proponents, especially in the land development side of things, they just want to skip right to, "Let's write a cheque". (Approval writer, personal communication, August 2009)

This approach to simply "bundling" wetland functions and services and exchanging them across long distances has led to wetlands being "abstracted from their place-specificity" (Robertson 2000), and has resulted in broad changes in the distribution, type, size, quality, and connectivity of wetlands. For example, in Alberta, wetlands have been replaced out-of-kind (i.e. not type-for-type), and many small wetlands have been replaced by a single large wetland, often in a different watershed. Further, decisions about where to locate compensation sites in Alberta are rarely driven by ecological criteria, but are instead influenced heavily by land availability, as articulated by a wetland restoration agency employee who said:

> The controlling factor for wetlands in the province, even though the water is provincial jurisdiction, [is that] the ownership of that land is private…if you could just go out and rebuild [wetlands] wherever you wanted it'd be real easy to do, but unfortunately they have to have approval from those landowners. (Wetland restoration agency employee, personal communication, August 2009)

Robertson & Hayden (2008) have also reported a trend in the Chicago region where mitigation banks are frequently located in areas where land value prices are considerably lower than at the site of impact. This arguably creates a large subsidy for industry and land developers who are able to buy credits in a wetland bank for far less money than they receive when their product is sold in the marketplace. While private interests gain considerably in this arrangement, the public largely pays this subsidy in the form of lost ecosystem goods and services (Mitsch & Gosselink 2000; De Groot et al. 2010), and there are often unanticipated social costs associated with the redistribution of wetlands through the use of compensation (Bendor et al. 2007; 2008).

The reliance on wetland banking or in-lieu fee payments as a mechanism to replace wetlands assumes that the values, functions, and services provided by the compensatory wetland are in some way equivalent to those that were lost, and are thus fungible (items freely interchangeable with another to satisfy an obligation). Where wetlands are assumed to be fungible, trade in these wetlands grows and the demand for comparability emerges. In Alberta, all of the government regulators that were interviewed indicated that the most common metric used for comparability or equivalency between impacted and compensatory wetlands is area, with very little consideration given to wetland functions or services. Wetlands have thus become a commodity in a market where the measure of comparability between the items being exchanged disregards ecological and social values and functions. As many other scholars have argued, wetlands vary considerably in their value and function by type, landscape context, and spatial scale (Mitsch & Gosselink 2000; Hein et al. 2006; De Groot et al. 2010); therefore, it is difficult to meet the goal of maintaining the biological, physical, and chemical integrity of wetlands in a market where area is the only criteria used to assess comparability.

3.3.4 "Techno-arrogance" Associated with Wetland Creation and Restoration Results in Increased Wetland Loss

The term "techno-arrogance" has been used by other scholars to describe humankind's approach to using technology to "solve" problems in the natural world, such as climate change, alien species invasions, or toxic pollutants, which have come about through anthropogenic activities (Meffe 1992; Ehrenfeld 2001). This thinking aptly characterizes the emerging industry of wetland creation and restoration in

North America. Underlying the notion that wetlands can be "created" is an implicit "faith" that with sufficient money, engineering, heavy equipment, and selection of materials, a wetland can be designed to fully mimic the values of a natural system as if it were a simple piece of machinery. In Alberta, there has been increasing pressure for the government to accept naturalized storm water management facilities (NSWMF) as complete or partial compensation for the loss of natural wetlands in urban growth areas. While these facilities are highly engineered and require continuous maintenance, many proponents argue that NSWMF are of higher quality than the wetlands they are replacing, as expressed by one land developer who said:

> We have to come up with a new scenario where we actually can recreate [the wetland]. The outline of that wetland is the same as it is in a natural state, but it'll be in an urban environment and fed [by] storm water through a pipe, and it'll be much better, at least aesthetically, than it is today. (Sr. Executive of a land development company, personal communication, August 2009)

The idea that a constructed wetland that visually resembles a natural wetland is adequate compensation ignores that wetlands grow and develop according to a myriad of highly variable inputs over time, including stochastic weather, random arrival events of species, competition, surface and groundwater interactions, and many others. The fluctuations and interactions of wetland ecosystems are more akin to human metabolism than they are to an automotive engine, with dynamic interacting components such as wetland soils, hydrologic regimes, riparian zones, and water chemistry that are linked to their surroundings. Constructed wetlands must grow, mature, and evolve, often requiring decades to centuries to stabilize and broadly resemble naturally occurring wetlands. Such time frames are rarely considered in the price of compensation.

Despite the complexity of wetland ecosystems, optimistic and naive land developers, economists, engineers, and policy makers often argue for compensation over avoidance, confident in the notion that constructed wetlands can adequately replace the values and functions of a natural wetland. The lack of focus on wetland avoidance allows for engineered compensatory wetlands to receive more political and economic value than their natural counterparts, as they provide decision makers the options, flexibility, and negotiation room beyond a hard and fast requirement to relocate the proposed development to a non-wetland site. The premise of compensatory offset wetland policies is that habitat loss can be mitigated

through the creation or restoration of habitat that is equivalent to that which was lost. The challenges associated with measuring, let alone reproducing, the full suite of ecological, social, and economic values and functions of a natural wetland makes the reliance on this policy approach untenable in all cases, and highlights the need to give greater consideration to avoidance in the mitigation sequence.

3.3.5 Inadequate Enforcement and Compliance of Wetland Law and Policy

Enforcement and compliance are key components to the success of any wetland regulatory program. The focus of enforcement action is on preventing "front-end" violations; that is, ensuring that wetlands are not filled without first securing a government permit or approval. For many wetland programs, ensuring that a permit has been issued prior to the loss of a wetland is a difficult task, as illustrated by a Massachusetts study that found more than 50% of the wetland acres filled in 2001 were "illegal or likely illegal" and occurred without a permit (Massachusetts Division of Watershed Management 2008). The problem of illegal wetland filling is certainly not unique to Massachusetts; in Alberta, an environmental consultant who was interviewed estimated that up to twenty percent of their clients had impacted a wetland prior to securing an approval (Sr. Environmental Scientist, personal communication, July 2009). Many in Alberta feel that this failure is due primarily to ignorance about the law and confusion over private versus public property rights, as articulated by one government employee who said:

> There is a large segment of the [agricultural] producer population that doesn't understand that bodies of water are crown land. [The wetland is] on their land, it's surrounded by [their land] – it must be theirs. (Alberta Government employee, personal communication, May 2010)

While there are clearly enforcement problems in many jurisdictions, there is also a growing need for "back-end" monitoring to ensure that compensation sites are performing adequately and are meeting the conditions set out in the permit. The list of studies documenting non-compliance in the United States is long (Zedler & Callaway 1999; for example see Brown & Veneman 2001; Turner et al. 2001; Reiss et al. 2009), and clearly articulate the general failure of permit holders to replace wetland functions through off-site compensation (Roberts 1993; Zedler 1996; Malakoff 1998; Cole & Shafer 2002; Spieles 2005; Burgin 2010). The lack of

government oversight to follow-up and ensure that the conditions of approvals for wetland losses are met over an appropriate timeframe reinforces the preference for compensation over avoidance; if permit holders are not held accountable, then compensation is much easier and economical than avoidance.

There are many recorded failures to meet the ecological conditions stipulated in wetland permits, yet few studies have examined why regulatory compliance has been so weak. One such study, conducted by the (United States Government Accountability Office 2005), highlighted a number of major shortcomings of the regulatory process, including a general reluctance by the regulators to sanction violators, preferring instead to rely on negotiation to resolve the contravention. In many cases, legal recourse for non-compliance was not an option, as the conditions of the permits were not specific enough to allow for enforcement action against the violator, harkening back to the simple and vague language mentioned earlier.

In Alberta, an Auditor General's report released in 2010 criticized the government for its failure to adequately follow-up on wetland approvals to ensure that wetland compensation requirements were being met, and insisted that "[the Department of] Environment needs stronger systems to ensure that … approval holders comply with the conditions in their authorizations" (Auditor General of Alberta 2010). The lack of follow-up action appears to be related to the administrative structure of the compliance and enforcement program, in which staff are primarily focused on responding to violations that come to the attention of the government through public complaints or self-reporting (Environmental Protection Officer, personal communication, July 2009). Further, Department of Environment efforts are focused almost entirely on enforcement action for violations that occur without an approval, rather than sanctioning proponents who violate the conditions of an existing approval; once an approval for a wetland impact has been issued there is very little credible threat of sanction for non-compliance. As one government approval writer pointed out:

> The department is really good at issuing the approvals and doing the up-front work … we're not as good as following up with the monitoring and the back-end stuff, just because you get busy with the next project. There's always something coming up, the next fire to manage. (Approval writer, personal communication, August 2009)

This reactive, rather than proactive, approach to wetland regulation in Alberta appears to be related, at least in part, to a lack of government capacity and resources, as expressed by another approval writer who said:

> I think we need to be more proactive, and probably any person that you talk to would agree with that statement – that the government needs to be proactive, but it's a matter of resources … it's pretty obvious to me that we're somewhat understaffed in terms of our ability to deal with some of these approval situations, and probably even more so in the enforcement and compliance end of things where we just don't have the capacity to be proactive. We're a reactive organization right now. (Approval writer, personal communication, June 2009)

Some authorities claim that increased oversight by regulatory agencies, such as more frequent interaction with permit holders, regular site visits, and more frequent enforcement actions, could improve compliance outcomes (National Academy of Sciences' National Research Council 2001; Schulte-Hostedde et al. 2007; Reiss et al. 2009). More rigorous record keeping (Kentula et al. 1992; Minns et al. 1996) and better coordination of policy within and between jurisdictions and agencies responsible for wetland permitting (Race & Fonseca 1996; Austen & Hanson 2007) have also been suggested as a means for achieving better compliance. By improving compliance, not only would outcomes for compensatory habitat creation be improved, it may act as an adequate deterrent if the costs associated with meeting compensation requirements outweighed those of avoiding the wetland in the first place.

3.4. Alternatives to Address Key Failures in Wetland Avoidance

In order to establish stronger links between avoidance mechanisms, land use planning, and regulation, jurisdictions that rely on the mitigation sequence to manage wetlands will need to consider a variety of different policy tools. Below are some thoughtful, though mostly untested, considerations for re-instituting avoidance as a workable option in wetland management, including: watershed-based planning; more comprehensive economic and social valuation of wetlands; and long-term citizen-based monitoring schemes.

3.4.1 Watershed-based Planning

Watershed planning can provide an ecologically relevant alternative to the current piece-meal and compensation-focused approach to land use planning. The National Academy of Sciences' National Research Council report (2001 p. 4) on wetland losses concluded that:

> A preference for on-site or in-kind mitigation should not be automatic, but should follow from an analytically based assessment of the wetland needs in the watershed and the potential for the compensatory wetland to persist over time.

By placing wetlands within a broader landscape context, watershed planning can help to prioritize the conservation of high value wetlands, or identify land uses that may not be compatible with regional wetland conservation goals (Stein & Ambrose 1998; Brooks et al. 2006b; Chavan et al. 2008). Using science-informed watershed plans, wetlands can be managed within a larger hydrologic and ecologic regime that considers issues of water quantity and quality, habitat connectivity, and biodiversity in all of its complexity (Margules & Pressey 2000; National Academy of Sciences' National Research Council 2001).

A powerful science-based decision support tool that can be utilized for conservation planning at the watershed scale is systematic conservation planning (SCP). Systematic conservation planning is a rigorous, transparent, and repeatable framework that attempts to reduce the "uninformed opportunism" of traditional conservation planning by integrating multiple criteria (e.g. ecological, sociopolitical, economic) into broader landscape planning and decision making (Margules & Pressey 2000; Sarkar et al. 2006; Pressey & Bottrill 2008). The framework for systematic conservation planning generally consists of several key steps (Margules & Pressey 2000; Groves 2003): setting conservation goals; identification of conservation criteria; development of a conservation strategy; identification of conservation areas; implementation and prioritization; and finally, monitoring and management. By utilizing this framework and systematically identifying wetland conservation criteria – the elements of biological and physical diversity that will be the focus of planning efforts – meaningful conservation goals can be set within a watershed, and priorities for wetland conservation, protection, or alternative management approaches can be identified in advance of development.

One key strength of SCP is the potential to involve local resource users and other key social actors at various stages in the process, including setting conservation goals, developing criteria and management strategies, and monitoring outcomes (Cowling & Pressey 2003; Pierce et al. 2005; Sarkar et al. 2006). Through SCP, local and regional conservation plans can be tailored to reflect the local context, allowing for the inclusion of a wide variety of perspectives and values in the planning process. The resulting user-friendly and target-driven planning tools that are the products of SCP can be used by authorities at various jurisdictional levels, from municipal to regional, to help inform land use planning and decision making (Pierce et al. 2005). Wetlands can thus be framed in both time and place by iteratively and adaptively identifying future land use pressures and potential risks, thereby allowing for a greater emphasis being placed on the avoidance of wetlands that have been identified as being high-priority for management.

More comprehensive watershed-based planning also allows for the development and use of region-specific wetland functionality indicators that can be derived through the use of benchmark or reference sites. Matthews & Endress (2008) suggested that the use of benchmarks could help agencies with permit approvals, selection of mitigation site locations, calculation of compensation ratios, development of performance criteria, and implementation of post-construction monitoring protocols. Bedford (1999) argued that wetland restoration would be more successful if individual wetland restoration decisions are made in light of past and present regional profiles, and Olsen and Christie (2000) highlighted the importance of locally and socially relevant indicators to build local ownership of coastal (wetland) management, especially for direct users/abutters of wetlands. Watershed planning can also provide rich opportunities for more place-based and prescriptive restoration goals (Olsen & Christie 2000; Stanturf et al. 2001), thereby addressing some of the competing goals (individual to structural) that limit overall restoration effectiveness.

As landscape-level approaches to wetland management replace previous command-and-control style regulations, planners among different levels of government will need to coordinate carefully (BenDor & Doyle 2010), particularly in areas where watershed plans cross jurisdictional boundaries. The coordination required for watershed management can help clarify jurisdictional issues and

uncertainties (Environmental Law Institute 2009), and improve interagency communication (Olsen and Christie 2000). While BenDor et al. (2007) found tension between local authorities as watershed-based management proponents, such tension was not necessarily disadvantageous, as it provided an avenue to help local and extra-local stakeholders more clearly articulate goals for restoration projects. Ehrenfeld (2000) acknowledged such tension as an important component of projects because it "sets expectations, drives the detailed plans for actions, and determines the kind and extent of post-project monitoring".

Globally, climate change poses considerable threats to wetlands due to forecasted changes in hydrological regimes (Acreman et al. 2009; Johnson et al. 2010). As climate change planning is increasingly incorporated into natural resource management, watershed-based planning offers an effective mechanism in which to accommodate the impacts of climate change on wetlands (Simenstad et al. 2005; Erwin 2009). In certain parts of the world where climate change begins to negatively impact water resources, the water storage, filtration, carbon sequestration, biodiversity maintenance, and other ecological goods and services offered by wetlands will become increasingly valuable. Thus, watershed planning will allow for more accurate assessments of a region's vulnerability to climate change-related risks, such as drought (Hurd et al. 1999), and will be an important tool for assigning priority for the management of high-value wetlands.

This approach to wetland management is not novel, and has previously been applied in some jurisdictions in one form or another, with varying degrees of success. For example, the US Environmental Protection Agency has an Advanced Identification (ADID) planning program that identifies wetlands that are "suitable or unsuitable for the discharge of dredged and fill materials", with the intent of providing local communities with "information to help them better understand the values and functions of wetlands in their areas" (Environmental Protection Agency 2009). While this approach has merit, the program is not widespread and is not mandatory; thus, it is likely of limited use in planning and management at large scales. The concept of watershed planning also confronts tensions over the management of common pool resources on private property. This conflict is very real and presents itself as a significant challenge in the development and implementation of any watershed plan. For example, Ando & Getzner (2006)

examined the role of land ownership in wetland conservation decisions in Australia, and found that wetlands were more likely to be protected on public versus private lands, and concluded "ownership status is a significant factor in the pattern of wetland conservation" (pg. 302). While land ownership issues are a barrier to watershed-level planning and conservation, there is an emergence of new policy tools that may offer some opportunities in this regard, including biodiversity off-sets (tenKate et al. 2004), transfer of development credits (Pruetz & Standridge 2009), and reverse auctions (Packman 2010), to name only a few. Whether these tools are able to overcome the challenges of managing wetlands on private property remains to be seen.

3.4.2 More Comprehensive Ecological and Social Valuation of Wetlands

Making informed decisions about the economic trade-offs associated with a given permit application are difficult for both developers and wetland regulators because the ecological, social, and economic values of wetlands are difficult to identify, combine, compare, value, and aggregate, resulting in a chronic undervaluation of wetland habitats (Turner et al. 2000; Carlsson et al. 2003; Costanza et al. 2008). Under current accounting practices and market orientation, the economic value of land adjacent to a wetland often exceeds the "assumed" value of the wetland itself, which leads to the belief that wetland avoidance is an impracticable economic option. This tendency to perceive wetlands as economic liabilities may be overcome if ecosystem services and social values were accounted for in permit and planning processes. Incorporating economic and social valuation processes into wetland permit approvals may help link the desired ecosystem goods and services to benefit-cost analyses of areas being considered for development. In turn, increased economic values attached to those broader ecosystem and other non-market services (e.g. aesthetics, recreation, education) may provide disincentives to wetland development and help to focus development in non-wetland areas. By including environmental and social considerations in the accounting standards under which wetland regulators and land developers make their decisions, the notion of wetland compensation takes on a new meaning. It becomes much more costly to compensate for wetlands loss when the "true cost" of that loss is borne by the permittee, rather than the public.

3.4.3 Long-term Citizen-based Monitoring Schemes

One of the reasons identified for the policy failure of wetland avoidance is inadequate enforcement of compensation requirements. This lack of enforcement can occur because of shrinking budgets for enforcement personnel, or it may be due to a deficiency in the quality or quantity of information available to enforce regulations, such as inadequate assessment or monitoring data. If wetland regulators do not have reliable data on the performance of natural, reclaimed, or constructed wetlands, it becomes very difficult to make evidence-based land use planning decisions. At the same time, environmental policy in North America is experiencing a move away from command-and-control style management towards self-enforcing market-based policies (Daley 2007), and increasingly towards resilience management such as adaptive co-management, networked, or collaborative environmental governance (Armitage 2008; Reed 2008).

One type of program that has strong potential in this emergent policy space is the use of long-term, citizen-based monitoring schemes to help manage local wetlands. These schemes would not only encourage local stewardship of wetlands, but would also provide data to help regulators gauge approval compliance, potentially resulting in improved environmental outcomes. For example, citizens have been trained to identify functional and structural characteristics of wetlands, and report on these measures in a consistent, reliable manner, at low cost to local institutions (Koontz & Thomas 2006). Inherent to this program might be an empirical expression of human valuation and appreciation for the wetlands, giving greater opportunity to measure the intangible social value of these habitats. With this new data and more engaged local citizens, it is more likely that wetlands will be avoided during development, as compared to decisions that are made in the absence of data and a locally organized wetland group. The inadvertent creation of local political will and interest in wetlands may be an antidote to public apathy, thereby resulting in more careful scrutiny of development plans and the elevation of avoidance as the key policy activity for wetlands protection.

While the use of citizen scientists is a relatively recent phenomenon, citizens are increasingly being included in conservation and restoration planning (Oscarson & Calhoun 2007; Currin et al. 2008) and have been found to be effective assistants to local land managers (Sharpe & Conrad 2006). If a standard protocol is used (e.g.

Christmas Bird Count), a diverse public can be used as a local resource that is capable of collecting data on both wetland structure and function (Currin et al. 2008). By utilizing citizen participation, not only are costs lowered compared to traditional data collection methods, but local stewardship is also promoted, with local communities benefiting directly from the educational value of participation (Hudson 2001). The outcome may be a more engaged and informed citizenry that can bring political pressure to bear on the issues of wetland conservation, making wetland avoidance a more practicable option from a sociopolitical perspective. For example, (Meyer & Konisky 2007) found that local environmental institutions that have included a broad array of community-based efforts to increase local participation in environmental decision making, particularly though local bylaws that protect wetlands, outperform jurisdictions that lack similar bylaws on numerous wetland measures.

3.5. Conclusions

Wetland avoidance needs to be reinstituted as the first, and most preferred option for wetland management in jurisdictions that utilize the mitigation hierarchy. While there is recognition in the literature that wetland avoidance is not practicable in all circumstances, there is overwhelming consensus that in order to meet wetland management goals, more emphasis needs to be placed on avoidance. Government decision making is highly influenced by the subjective and ill-defined notion of *balancing* development and the environment; hence, governments are often fraught with a permissive orientation that makes avoidance optional, or even an afterthought. Where wetland avoidance is ignored, impact minimization and compensation become the default regulatory processes for wetland conservation. Decision makers and regulators need to better consider the public goods and services that flow from wetlands, and account for these losses in all compensation schemes using the best social and ecological data available. A move towards a true cost accounting approach may help address the inequitable behavior of societies where a select number of individuals reap the short-term benefits of wetland loss, while the public pays the cost for generations to come.

The literature clearly suggests that avoidance is not synonymous with preventing wetland loss. A proactive approach to protecting wetlands requires land

use planning that safeguards the ecological, social, and economic value and function of wetlands, both locally and within the larger landscape. This can be achieved by systemically planning for wetland conservation in advance of development, engaging the public in the monitoring and management of wetlands, and developing a more comprehensive valuation scheme that acknowledges the complex ecological and social values of wetlands at multiple spatial scales. For meaningful areas of natural wetlands to remain in jurisdictions that rely on the wetland mitigation sequence, the public's ability to identify and communicate wetland values will need to develop commensurately with the unfolding development being leveled at wetlands, as this provides the greatest long-term hope for sustained public interest in policies that promote wetland conservation.

3.6. Literature Cited

Acreman, M. C., J. R. Blake, D. J. Booker, R. J. Harding, N. Reynard, J. O. Mountford, and C. J. Stratford. 2009. A simple framework for evaluating regional wetland ecohydrological response to climate change with case studies from Great Britain. Ecohydrology 2:1–17.

Alberta Water Resources Commission. 1993. Wetland management in the settled area of Alberta: an interim policy. Pages 1–18. Alberta Water Resources Commission, Edmonton, AB, Can.

Ando, A., and M. Getzner. 2006. The roles of ownership, ecology, and economics in public wetland-conservation decisions. Ecological Economics 58:287–303.

Armitage, D. 2008. Governance and the commons in a multi-level world. International Journal of the Commons 2:7–32.

Auditor General of Alberta. 2010. Report of the Auditor General of Alberta - April 2010. Pages 1–224. Office of the Auditor General, Edmonton, AB, Canada.

Austen, E., and A. Hanson. 2007. An analysis of wetland policy in Atlantic Canada. Canadian Water Resources Journal 32:163–178.

Baer, W. 1997. General plan evaluation criteria: An approach to making better plans. Journal of American Planning Association 63:329–344.

Bedford, B. 1999. Cumulative effects on wetland landscapes: links to wetland restoration in the United Sates and southern Canada. Wetlands 19:775–788.

BenDor, T., and M. W. Doyle. 2010. Planning for Ecosystem Service Markets. Journal of the American Planning Association 76:59–72.

Bendor, T., N. Brozovic, and P. Pallathucheril. 2007. Assessing the socioeconomic impacts of wetland mitigation in the Chicago region. Journal of American Planning Association 73:263–282.

Bendor, T., N. Brozovic, and V. Pallathucheril. 2008. The Social Impacts of Wetland Mitigation Policies in the United States. Journal of Planning Literature 22:343–357.

Birol, E., and V. Cox. 2007. Using choice experiments to design wetland management programs: The case of Severn Estuary Wetland, UK. Journal of Environmental Planning and Management 50:363–380.

Boyer, T., and S. Polasky. 2004. Valuing urban wetlands: A review of non-market valuation studies. Wetlands 24:744–755.

Brody, S., and W. Highfield. 2005. Does Planning Work?: Testing the Implementation of Local Environmental Planning in Florida. Journal of the American Planning Association 71:159–175.

Brooks, J., M. Franzen, C. Holmes, M. Grote, and M. Mulder. 2006a. Testing hypotheses for the success of different conservation strategies. Conservation Biology 20:1528–1538.
Brooks, R. P., D. H. Wardrop, and C. A. Cole. 2006b. Inventorying and Monitoring Wetland Condition and Restoration Potential on a Watershed Basis with Examples from Spring Creek Watershed, Pennsylvania, USA. Environmental Management 38:673–687.
Brooks, R., D. Wardrop, and J. Bishop. 2004. Assessing wetland condition on a watershed basis in the mid-Atlantic region using synoptic land-cover maps. Environmental Monitoring And Assessment 94:9–22.
Brown, S., and P. Veneman. 2001. Effectiveness of compensatory wetland mitigation in Massachusetts. Wetlands 21:508–518.
Burgin, S. 2008. BioBanking: an environmental scientist's view of the role of biodiversity banking offsets in conservation. Biodiversity and Conservation 17:807–816.
Burgin, S. 2010. "Mitigation banks" for wetland conservation: a major success or an unmitigated disaster? Wetlands Ecology and Management 18:49–55.
Carlsson, F., P. Frykblom, and C. Liljenstople. 2003. Valuing wetland attributes: an application of choice experiments. Ecological Economics 47:95–103.
Chavan, P. V., K. E. Dennett, and E. A. Marchand. 2008. Behavior of pilot-scale constructed wetlands in removing nutrients and sediments under varying environmental conditions. Water, Air, & Soil Pollution 192:239–250.
Chertok, M., and K. Sinding. 2005. Federal jurisdiction over wetlands: "Waters of the United States." Pages 59–104 in K. Connolly, S. Johnson, and D. Williams, editors. Wetlands law and policy. American Bar Association, Chicago, IL, USA.
Cole, C., and D. Shafer. 2002. Section 404 wetland mitigation and permit success criteria in Pennsylvania, USA, 1986 - 1999. Environmental Management 30:508–515.
Costanza, R. R., O. O. Pérez-Maqueo, M. L. M. Martinez, P. P. Sutton, S. J. S. Anderson, and K. K. Mulder. 2008. The value of coastal wetlands for hurricane protection. Ambio 37:241–248.
Cowling, R., and R. Pressey. 2003. Introduction to systematic conservation planning in the Cape Floristic Region. Biological Conservation 112:1–13.
Currin, C. A., P. C. Delano, and L. M. Valdes-Weaver. 2008. Utilization of a citizen monitoring protocol to assess the structure and function of natural and stabilized fringing salt marshes in North Carolina. Wetlands Ecology and Management 16:97–118.
Dahl, T. E., and M. D. Watmough. 2007. Current approaches to wetland status and trends monitoring in prairie Canada and the continental United States of America. Canadian Journal Of Remote Sensing 33:S17–S27.
Daley, D. M. 2007. Voluntary Approaches to Environmental Problems: Exploring the Rise of Nontraditional Public Policy. The Policy Studies Journal 35:165–180.
De Groot, R., R. Alkemade, L. Braat, L. Hein, and L. Willemen. 2010. Challenges in integrating the concept of ecosystem services and values in landscape planning, management and decision making. Ecological Complexity 7:260–272.
Ehrenfeld, D. 2001. The arrogance of humanism. Oxford University Press, New York, NY, USA.
Ehrenfeld, J. 2000. Defining the limits of restoration: The need for realistic goals. Restoration Ecology 8:2–9.
Ellis, W. 2005. The EPA veto and related matters. Pages 283–304 in K. Connolly, S. Johnson, and D. Williams, editors. Wetland law and policy. American Bar Association, Chicago, IL, USA.
Environmental Law Institute. 2006. The status and character of in-lieu fee mitigation in the United States. Pages 1–144. Environmental Law Institute, Washington, DC, USA.
Environmental Law Institute. 2009. Wetland avoidance and minimization in action: perspectives from experience. Pages 1–14. Environmental Law Institute, Washington, DC, USA.
Environmental Protection Agency. 2009. Advanced identification (ADID). Retrieved from http://www.epa.gov/owow/wetlands/facts/fact28.html.
Erwin, K. L. 2009. Wetlands and global climate change: the role of wetland restoration in a changing world. Wetlands Ecology and Management 17:71–84.

Fluett, C., and N. Krogman. 2008. Barriers to changing Alberta's oil and gas tenure system: Lessons from an oil dependent state. Projections: MIT Journal of Planning 8:120–139.
Groves, C. 2003. Drafting a Conservation Blueprint. Island Press, Washington, DC.
Hein, L., K. Vankoppen, R. Degroot, and E. Vanierland. 2006. Spatial scales, stakeholders and the valuation of ecosystem services. Ecological Economics 57:209–228.
Hough, P., and M. Robertson. 2009. Mitigation under Section 404 of the Clean Water Act: where it comes from, what it means. Wetlands Ecology and Management 17:15–33.
Huppes, G., and C. Midden. 1991. Regulations and incentives as solutions to the social dilemma in wetland management. Landscape And Urban Planning 20:197–204.
Hurd, B., N. Leafy, and R. Jones. 1999. Relative regional vulnerability of water resources to climate change 35:1399–1409.
Johnson, W. C., B. Werner, G. R. Guntenspergen, R. A. Voldseth, B. Millett, D. E. Naugle, M. Tulbure, R. W. H. Carroll, J. Tracy, and C. Olawsky. 2010. Prairie Wetland Complexes as Landscape Functional Units in a Changing Climate. Bioscience 60:128–140.
Kentula, M., J. Sifneos, J. Good, M. Rylko, and K. Kunz. 1992. Trends and patterns in Section 404 permitting requiring compensatory mitigation in Oregon and Washington, USA. Environmental Management 16:109–119.
Koontz, T., and C. Thomas. 2006. What Do We Know and Need to Know about the Environmental Outcomes of Collaborative Management? Public Administration Review 66: 111-121.
Krogman, N. 1996. Frame disputes in environmental controversies: the case of wetland regulations in Louisiana. Sociological Spectrum 16:371–400.
Krogman, N. 1999. Bureaucratic slippage in organizations responsible for protecting the environment: the case of wetlands regulation. Research in Social Problems and Public Policy 7:163–181.
Kruczynski, W. 1990. Mitigation and the Section 404 program: A perspective. in J. Kusler and M. Kentula, editors. Wetland creation and restoration: The status of the science. Island Press.
LaPeyre, M., M. Reams, and I. Mendelssohn. 2001. Linking actions to outcomes in wetland management: an overview of US state wetland management. Wetlands 21:66–74.
Lovell, S. T., and W. C. Sullivan. 2006. Environmental benefits of conservation buffers in the United States: evidence, promise, and open questions. Agriculture Ecosystems & Environment 112:249–260.
Malakoff, D. 1998. Restored wetlands flunk real-world test. Science 280:371–372.
Mann, R., and J. Goldman-Carter. 2008. Avoidance: still the best solution to the compensatory mitigation challenge. National Wetlands Newsletter July-August:8–10.
Margules, C., and R. Pressey. 2000. Systematic conservation planning. Nature 405:243–253.
Massachusetts Division of Watershed Management. 2008. Massachusetts year 2008 integrated list of waters final listing of the condition of Massachusetts' water pursuant to Sections 303(d) and 305(b) of the Clean Water Act. Division of Watershed Management Watershed Planning Program, Worcester, MA, USA. Retrieved from http://www.mass.gov/dep/water/resources/08list2.doc.
Matthews, J. W., and A. G. Endress. 2008. Performance criteria, compliance success, and vegetation development in compensatory mitigation wetlands. Environmental Management 41:130–141.
Meffe, G. 1992. Techno-Arrogance and Halfway Technologies: Salmon Hatcheries on the Pacific Coast of North America. Conservation Biology 6:350-354.
Meyer, S., and D. Konisky. 2007. Local Institutions and Environmental Outcomes: Evidence from Wetlands Protection in Massachusetts. The Policy Studies Journal 35:481–502.
Minns, C., J. Kelso, and R. Randall. 1996. Detecting the response of fish to habitat alterations in freshwater ecosystems. Canadian Journal of Fisheries and Aquatic Science Suppl.1:403–414.
Mitsch, W., and J. Gosselink. 2000. The value of wetlands: importance of scale and landscape setting. Ecological Economics 35:25–33.
Mitsch, W., and R. Wilson. 1996. Improving the success of wetland creation and restoration

with know-how, time, and self-design. Ecological Applications 6:77–83.
Moeltner, K., and R. Woodward. 2009. Meta-Functional Benefit Transfer for Wetland Valuation: Making the Most of Small Samples. Environmental & Resource Economics 42:89–108.
Murphy, J., J. Goldman-Carter, and J. Sibbing. 2009a. Avoidance avoided. How the new rule fails to adequately promote avoidance and places difficult-to-replace systems at risk. National Wetlands Newsletter March-April:14–15.
Murphy, J., J. Goldman-Carter, and J. Sibbing. 2009b. New Mitigation Rule Promises More of the Same: Why the New Corps and EPA Mitigation Rule Will Fail to Protect Our Aquatic Resources Adequately. Stetson Law Review 38:311–336.
National Academy of Sciences' National Research Council. 2001. Compensating for Wetland Losses Under the Clean Water Act, 1st edition. National Academy Press, Washington, DC.
Nichols, S. 2008. Enhancing wetland protection through improved avoidance and minimization. National Wetlands Newsletter January-February:5–7.
QSR International Pty Ltd. 2008. NVivo Qualitative Data Analysis Software.
Olsen, S., and P. Christie. 2000. What are we learning from tropical coastal management experiences? Coastal Management 28:5–18.
Oscarson, D. B., and A. J. K. Calhoun. 2007. Developing vernal pool conservation plans at the local level using citizen-scientists. Wetlands 27:80–95.
Packman, K. A. 2010. Investigation of Reverse Auctions for Wetland Restoration in Manitoba. MSc Thesis. University of Alberta, Edmonton, AB, Can.
Pierce, S., R. Cowling, A. Knight, A. Lombard, M. Rouget, and T. Wolf. 2005. Systematic conservation planning products for land-use planning: Interpretation for implementation. Biological Conservation 125:441–458.
Pifher, M. 2005. The Section 404(b)(1) guidelines and practicable alternatives analysis. Pages 221–252 in K. Connolly, S. Johnson, and D. Williams, editors. Wetland law and policy. American Bar Association, Chicago, IL, USA.
Pressey, R. L., and M. C. Bottrill. 2008. Opportunism, Threats, and the Evolution of Systematic Conservation Planning. Conservation Biology 22:1340–1345.
Pruetz, R., and N. Standridge. 2009. What Makes Transfer of Development Rights Work? Success Factors From Research and Practice. Journal of the American Planning Association 75:78–87.
Race, M., and M. Fonseca. 1996. Fixing compensatory mitigation: What will it take? Ecological Applications 6:94–101.
Reed, M. S. 2008. Stakeholder participation for environmental management: A literature review. Biological Conservation 141:2417–2431.
Reiss, K., E. Hernandez, and M. Brown. 2009. Evaluation of Permit Success in Wetland Mitigation Banking: A Florida Case Study. Wetlands 29:907–918.
Roberts, L. 1993. Wetlands trading is a loser's game, say ecologists. Science 260:1890–1892.
Robertson, M. M. 2000. No net loss: wetland restoration and the incomplete capitalization of nature. Antipode 32:463–493.
Robertson, M., and N. Hayden. 2008. Evaluation of a market in wetland credits: entrepreneurial wetland banking in Chicago. Conservation Biology 22:636–646.
Rubec, C. D. A., and A. R. Hanson. 2008. Wetland mitigation and compensation: Canadian experience. Wetlands Ecology and Management 17:3–14.
Ruhl, J., and J. Salzman. 2006. The effects of wetland mitigation banking on people. Florida State University College of Law Public Law and Legal Theory Working Paper 179:20.
Ruhl, J., J. Salzman, and I. Goodman. 2009. Implementing the new ecosystem services mandate of the Section 404 Compensatory Mitigation Program - a catalyst for advancing science and policy. Stetson Law Review 38:251–272.
Salzman, J., and J. Ruhl. 2005. No net loss - instrument choice in wetland protection. Duke Law School of Science, Technology and Innovation Research Paper Series Research Paper 1:25.
Sarkar, S., R. Pressey, D. Faith, C. Margules, T. Fuller, D. Stoms, A. Moffett, K. Wilson, K. Williams, and P. Williams. 2006. Biodiversity conservation planning tools: present

status and challenges for the future. Annual Review of Environment and Resources 31:123-159.
Schulte-Hostedde, B., D. Walters, C. Powell, and D. Shrubsole. 2007. Wetland management: An analysis of past practice and recent policy changes in Ontario. Journal of Environmental Management 82:83–94.
Seasons, M. 2003. Monitoring and evaluation in municipal planning. Journal of American Planning Association 69:430–440.
Sharpe, A. A., and C. C. Conrad. 2006. Community based ecological monitoring in Nova Scotia: challenges and opportunities. Environmental Monitoring And Assessment 113:395–409.
Simenstad, C., D. Reed, and M. Ford. 2005. When is restoration not?: Incorporating landscape-scale processes to restore self-sustaining ecosystems in coastal wetland restoration. Ecological Engineering 26:27–39.
Spieles, D. 2005. Vegetation development in created, restored, and enhanced mitigation wetland banks of the United States. Wetlands 25:51–63.
Stanturf, J. A., S. H. Schoenholtz, C. J. Schweitzer, and J. P. Shepard. 2001. Achieving Restoration Success: Myths in Bottomland Hardwood Forests. Restoration Ecology 9:189–200.
Stein, E. D., and R. F. Ambrose. 1998. A rapid impact assessment method for use in a regulatory context. Wetlands 18:379–392.
Stokstad, E. 2008. Environmental Regulation: New Rules on Saving Wetlands Push the Limits of the Science. Science 320:162.
Taylor, W., and K. Geoffroy. 2005. General and nationwide permits. Pages 151–190 in K. Connolly, S. Johnson, and D. Williams, editors. Wetland law and policy. American Bar Association, Chicago, IL, USA.
tenKate, K., J. Bishop, and R. Bayon. 2004. Biodiversity Offsets: Views, Experience, and the Business Case. Cambridge, London, IUCN. Insight Investment. International Union for Conservation of Nature and Natural Resources and Insight Investment Management (Global) Ltd, London, UK.
Turner, R., A. Redmond, and J. Zedler. 2001. Count it by acre or function - mitigation adds up to net loss of wetlands. National Wetlands Newsletter 23:5–16.
Turner, R., J. van den Bergh, T. Soederqvist, A. Barendregt, J. van der Straaten, E. Maltby, and E. van Ierland. 2000. Ecological-economic analysis of wetlands: scientific integration for management and policy. Ecological Economics 35:7–23.
United States Government Accountability Office. 2005. Wetlands protection: Corps of Engineers does not have an effective oversight approach to ensure that compensatory mitigation is occurring. Pages 1–47 Report GOA 05-898. United States Government Accountability Office, Washington, DC, USA.
Walters, D., and D. Shrubsole. 2005. Assessing efforts to mitigate the impacts of drainage on wetlands in Ontario. The Canadian Geographer 49:151–171.
Wenig, M. 2006. The sleeping giant of watershed protection. Law Now. Retrieved from http://www.pekisko.ca/docs/D_060501_SleepingGiant.pdf.
Wilkinson, J., and J. Thompson. 2006. 2005 Status Report on Compensatory Mitigation in the United States. Environmental Law Institute:110.
Williams, D., and K. Connolly. 2005. Federal wetlands regulation: An overview. Pages 1–26 in K. Connolly, S. Johnson, and D. Williams, editors. Wetlands law and policy. American Bar Association, Chicago, IL, USA.
Yocom, T., R. Leidy, and C. Morris. 1989. Wetland protection through impact avoidance: A discussion of the 404(B)(1) alternatives analysis. Wetlands 9:283–297.
Zedler, J. 1996. Ecological issues in wetland mitigation: an introduction to the forum. Ecological Applications 6:33–37.
Zedler, J., and J. Callaway. 1999. Tracking wetland restoration: Do mitigation sites follow desired trajectories? Restoration Ecology 7:69–73.
Zedler, J., and S. Kercher. 2005. Wetland resources: Status, trends, ecosystem services, and restorability. Annual Review Of Environment And Resources 30:39–74.

CHAPTER 4

Bureaucratic Slippage and Environmental Offset Policies: The Case of Wetland Management in Alberta[14]

4.1. Introduction

Governments worldwide are increasingly being called upon to 'green' their economies, while at the same time, maintain or increase economic growth and prosperity. In order to meet these demands, many governments have turned to the use of economic instruments, such as environmental trading or offset programs, to help inform trade-off decisions between ecosystem protection and resource development. As a result, environmental trading programs have become popular tools for managing natural resources, from rare species and biodiversity, to carbon dioxide and wetlands (tenKate et al. 2004; McKenney & Kiesecker 2010). The goal of these programs is to achieve a 'no net loss' or 'net environmental benefit' by reducing or eliminating residual impacts, after first making efforts to avoid or minimize impacts. Mechanisms employed in these programs commonly include compensation, offsetting, banking, in-lieu fee (ILF) payments, or auction/brokering schemes, and well-known examples include US Wetland Mitigation, the Australian BushTender, BushBroker, and BioBanking programs, and the European Union's Natura 2000 network (McKenney & Kiesecker 2010).

These programs are fundamentally premised on the idea that the units being traded are in some way fungible; however, as many have argued, there are serious

[14] *A version of this chapter has been accepted and is in press: Clare and Krogman. 2012. Society and Natural Resources.*

challenges associated with effective program design and implementation, such as determining the appropriate timing, location, duration, currency, or equivalency of the trade (tenKate et al. 2004; Gibbons & Lindenmayer 2007; Walker et al. 2009; McKenney & Kiesecker 2010). For example, the US Wetland Mitigation program, which is one of the oldest and most well-studied trading programs in existence, has been plagued by failures attributed to inadequate assessment and exchange currencies, exchange rules that are poorly structured, and a lack of enforcement and compliance (Robertson 2000; Salzman & Ruhl 2000; Walker et al. 2009; Burgin 2010). Despite these challenges and failures, trading programs are considered to be promising policy tools that foster 'sustainable development' by allowing for decisions that 'balance' economic considerations with conservation objectives (tenKate et al. 2004).

To date, much of the scholarship examining the efficacy of trading programs has focused on evaluating the 'nuts-and-bolts' of program design, with a focus on currency and exchange adequacy (Gibbons & Lindenmayer 2007; McKenney & Kiesecker 2010). While program design is undoubtedly important, little work has been done to understand how design inadequacies may be manifest in policy implementation or regulatory oversight, and specifically, how decision making in these emerging policy arrangements facilitate or hinder policy performance. Some scholars suggest that design inadequacies, such as overly simplistic currencies and lax exchange restrictions, coupled with unequal power and divergent goals of the regulators and the regulated community, make trading programs difficult to administer and open to perversion of the public interest (Salzman & Ruhl 2000; Walker et al. 2009). Sociologists have also found that as government decision makers are called upon to use 'discretion' in the interpretation of environmental policies, regulations, and guidelines, final outcomes are often far afield from stated intentions (Freudenburg & Gramling 1994; Krogman 1999; McSpirit et al. 2005).

The failure of government agencies to fully and effectively implement environmental law and policy is not a new phenomenon, and because of this, there have been calls to more carefully attend to the details of policy implementation (Freudenburg & Gramling 1994; Schneiberg & Bartley 2008). While previous attention has been given to the effectiveness of regulatory enforcement, it has tended to focus on characterizing the specific acts or strategies of enforcement, with

less attention being given to how such enforcement is reshaped or influenced by ongoing and negotiated relations between regulators and those they regulate (Coslovsky et al. 2011). It is here, in the space where agency mandates and goals are interpreted and multiple interests are negotiated and traded, that both regulators and the regulated community significantly shape environmental outcomes. In his work on 'street-level bureaucrats'[15] Lipsky (1980) noted that in contrast to established laws, policies, and guidelines, it is "the decisions of street-level bureaucrats, the routines they establish, and the devices they invent to cope with uncertainties and work pressures (that) effectively *become* the public policies they carry out" (original italics). Thus, the requirement of front-line decision makers to contend with, and interpret, broad and ambiguous regulatory or policy statements over time and across multiple layers of implementation can result in decisions that deviate from, or even contradict, originally stated goals of the agency, often in ways that favor particular interests over others (Freudenburg & Gramling 1994; Krogman 1999; McSpirit et al. 2005; Coslovsky et al. 2011).

This study answers the call to more carefully attend to the details of policy implementation, and in particular, examines how front-line decision makers use their discretion to make wetland compensation decisions in Alberta, Canada. Following Freudenburg and Gramling (1994), the objective of this study is to measure "bureaucratic slippage" in the implementation of wetland compensation guidelines by empirically quantifying outcomes of wetland policy decisions, in order to compare these outcomes to agency guidelines that provide direction for compensation decisions. The relationship between bureaucratic slippage and agency capture is also explored, and the mechanisms that operate to produce agency capture in this case study are described to elucidate how agency design and culture contribute to incremental regulatory decisions that tend to favor regulated parties.

Bureaucratic slippage has been described by Freudenburg and Gramling (1994) as being a manifestation of, and a way to directly measure, the phenomenon of agency capture: that is, the ability of the regulated community to generally control regulatory decisions and/or performances that serve the interests of the regulated community over the interests of the public (Bernstein 1955). Traditionally, capture theory has focused on identifying blatant forms of capture, such as political

[15] Government agency workers with discretion over the dispensation of benefits or the allocation of public sanctions.

corruption or the replacement of neutral governance with biased role incumbents (the so called "revolving door"), which has typically been explained using the self-interested, rational actor model of public choice theory (Stigler 1971). Increasingly, however, capture theory has expanded to include consideration of situational factors and power relations that influence "how the stage is set, who has the power to set it, and what the purpose of the staging is" (Hanson & Yosifon 2003 p.149). Capture is thus not an "all or nothing" phenomenon that is wholly dependent upon the disposition of rational actors; rather, capture can be manifest incrementally through time and across jurisdictional space by decisions that are made by front-line bureaucrats whose choices may be constrained, either knowingly or unconsciously, by a myriad of situational factors (Hanson & Yosifon 2003; Balla 2011; Mitnick 2011).

While agency capture is difficult to empirically measure, bureaucratic slippage has been put forward as one way to reveal outcomes that arise from power relations that are hidden from view and often overlooked in the evaluation of policy outcomes (Freudenburg & Gramling 1994). Central to the concept of bureaucratic slippage is that capture can be identified in the 'details' of policy implementation, which can be measured through critical examination of agency performance (Freudenburg & Gramling 1994). By comparing implied commitments made in environmental law, policy, or guidance documents with the observable and tangible actions of those agencies responsible for administering government commitments, intentional and unintentional as well as subtle and blatant obfuscations of policy commitments can be measured through slippage. By measuring bureaucratic slippage and examining the underlying mechanisms that lead to capture, greater attention can be brought to bear on how agency design and culture, rather than simply regulator preference, contribute to regulatory decisions that favor powerful actors over time.

What follows in Section 4.2 is background that provides context for understanding the existing regulatory requirements and approach to wetland management in Alberta. This section is followed by a description of the methods that were used to quantify wetland compensation outcomes between 1999 and 2010, in addition to describing methods for identify the underlying factors that have influenced compensation decisions during that time. Section 4.4 presents the results

of this study, and includes a discussion of the mechanisms that drive agency capture in the implementation of wetland compensation guidelines. Finally, Section 4.5 provides concluding remarks and recommendations on how to improve wetland compensation outcomes.

4.2. Wetland Management in Alberta: Background and Context

Approvals for disturbing or destroying a wetland in Alberta are granted under the *Water Act* on a case-by-case basis. In each instance, government regulators and permitees negotiate the conditions of the permit, and these negotiations are directed by a wetland policy with the goal of sustaining "social, economic and environmental benefits" of functioning wetlands by applying a mitigation hierarchy of avoidance, minimization, and compensation (Alberta Water Resources Commission 1993). At the same time, regulators are bound by statutory requirements of the *Water Act*, the stated purpose of which is to "support and promote the conservation and management of water", while also "recognizing the need for Alberta's economic growth and prosperity"[16]. Thus, in each instance of negotiation, front-line decision makers must contend with ambiguous goals within an agency context where the prevailing discourse emphasizes the need to 'balance' wetland conservation with economic development (Clare et al. 2012).

A rise in the incidence of wetland compensation in the early 2000s, coupled with clear differences in how compensation decisions were being made by regional government offices, prompted the Alberta government to issue compensation guidelines in 2005 (which were reissued with minimal changes in 2007) to clarify expectations around acceptable types of compensation, preferred compensation site location, and suitable compensation ratios. While these rules are considered to be 'guidelines' and are not legally enforced, they were put in place to create a conformity of standard for wetland compensation decisions, and are the only 'formal rules' that guide wetland compensation practices in Alberta (for a more thorough discussion of the wetland permit process, see Clare et al. 2011).

Despite being very clear in the stated expectations around how wetland compensation should be carried out, there has been inconsistency in how these compensation guidelines have been interpreted and applied by regulators over time.

[16] Water Act, R.S.A 2000, c. W-3, §2

It is this discrepancy between what the guidelines say, and how those guidelines are applied by regulators over time that this study strives to quantify, thereby providing evidence of bureaucratic slippage and underlying agency capture, in the wetland approval process in Alberta.

4.3. Methods

This work was informed by 34 semi-structured, key-informant interviews that were conducted with a range of policy actors who regularly interacted with wetland policy, and included regulators and agency decision makers (17 interviews), employees of environmental organizations (5 interviews), industry representatives (6 interviews), and consultants (6 interviews). Key informants were asked a series of questions that probed their experiences working with wetland policy. Interviews ranged between one and three hours in duration and were held privately in an office setting. Interviews were transcribed and organized into conceptual themes in NVivo (QSR International Pty Ltd. 2008) using inductive coding (Thomas 2006). The views expressed by regulators and the regulated community regarding their experiences with the wetland approval process and wetland compensation decisions and outcomes were generally very similar, and quotes are representative of the range of responses heard in interviews. This conformity of views suggests that both regulators and the regulated community experienced similar challenges relating specifically to the wetland compensation decision-making process.

Quantitative wetland permit data were gathered from approvals issued in the central and southern regions of the province (i.e., the "White Area"), as well as approvals that were issued specifically for the Beaverhill subwatershed. The data came from three sources:

1) Department of Environment *Water Act* approval provincial database. A request was made for all *Water Act* approvals issued in the White Area between 1999 and August 2011. The data returned included: approval number; proponent name; date of approval issue and expiry; wetland activity; and location information for the site of impact. No information on wetland compensation was returned, as this information is not tracked in this database.

2) Department of Environment Northern Region Office *Water Act* approval files. Between June 23 and July 4, 2009, and July 12 and 16, 2010, files associated with approvals that were issued in the Beaverhill subwatershed for wetland impacts occurring between 1999 and 2009 were physically examined. The following information was gathered from the files and entered into a relational database (FileMaker, Inc 2007): date of authorization and expiry; proponent name; location information for impact and compensation sites; number, class, and size of wetlands impacted; type of compensation required; price paid per hectare (if a compensation payment was made); and number, class, and size of wetlands created as compensation[17].
3) Ducks Unlimited Canada Wetland Loss Compensation Annual Reports. Ducks Unlimited Canada (DUC) is the only restoration agency authorized by the government of Alberta to receive wetland compensation payments and must submit an annual report detailing how compensation funds have been allocated. DUC annual compensation reports that were issued in 2009 and 2010 (which included a summary of all compensation payments received by DUC since 1999), were requested from the Department of Environment. The reports included: approval number; year the approval was issued; name of proponent; compensation payment amount; location, class, and area of wetland impacted; replacement area and ratio; location, class, and area of the compensatory wetland; and the amount (%) of the payment allocated to each Ducks Unlimited compensation project.

All data were combined to create a list of wetland approvals issued between 1999 and 2010 in the White Area that required off-site compensation through an ILF payment. No single data source contained an exhaustive list of approvals, and agreement between the data sources was quite low. For example, instances of missing records and/or incorrect or conflicting information (e.g., dates, approval numbers) between the datasets were common, which suggests inherent problems with information tracking and sharing by both the government and DUC. Where possible, conflicting information was verified using 'official' government documents

[17] In many cases, the desired information was not contained within the files. For example, location data for compensatory wetlands was often missing, particularly in instances where compensation took the form of in-lieu fee payments. In addition, data related to the number and class of wetlands impacted, and subsequently created, was often absent from files.

(i.e., *Water Act* approvals) that were obtained on-line (Government of Alberta 2012) or in person.

Wetland impact and compensation site locations for each approval (if available) were spatially referenced in a Global Information System (Environmental Systems Resource Institute 2010) using the Legal Land Description (LLD) from approvals data. Using the Alberta Township Survey polygon (Government of Alberta 2005), a centroid coordinate (NAD 1983, 10TM, AEP Resource) for each quarter section with a reported wetland impacted was generated, and the distance between impact and compensation centroids for each wetland impact was calculated using Hawth's Tools (Beyer 2004). Given that a single approval is often issued for multiple wetland impacts, displacement distances were calculated for every quarter section with a reported wetland impact, rather than calculating average displacement distances for each approval. Impact and compensation centroids were spatially joined to the watershed using the Environment Canada 4-character sub-basin spatial layer (PFRA/Agriculture and Agri-Food Canada 2008) and the number of approvals issued and number of quarter sections with a wetland impact was calculated by subwatershed using a frequency statistic in ArcMap. For approvals lacking impact and/or compensation location data, distance values could not be calculated. Summary statistics were performed using the statistical package R (R Development Core Team 2011).

Bureaucratic slippage was measured by comparing key statements made in the provincial compensation guidelines (Alberta Environment 2007) to empirical data measuring actual outcomes. These outcomes were quantified and compared for each year between 1999 and 2010, and included a period before (1999-2004) and after (2005-2010) the introduction of the compensation guidelines, thereby allowing for comparisons of agency performance before and after guideline introduction.

4.4. Results & Discussion

4.4.1 Bureaucratic Slippage in the Implementation of Wetland Compensation Guidelines

Slippage in the Prioritization of Avoidance Over Compensation

"Alberta Environment's priority is to avoid having land development impact wetland area whenever possible" - Provincial Wetland Restoration/Compensation Guide (Alberta Environment 2007 p. ii)

While the language in the compensation guidelines and the interim wetland policy is clear with respect to a preference for avoidance over compensation, approval data show a steady increase in the number of wetland-related approvals issued between 1999 and 2010, with a near doubling in 2007 (Table 4-1). While these numbers would be more meaningful in the context of understanding wetland impacts as a proportion of the total number of *Water Act* approvals issued in a given year, or in relation to the number of wetland-related approvals that have been denied, this comparison was not possible because the data required for this analysis were not available. In absence of data quantifying permit denials, qualitative data from interviews suggest that the government rarely (if ever) denies an approval for a wetland impact, as articulated by one Government employee who said:

> "You need to have some strength and willingness on the regulator's side to be able to say 'no', and I'm not sure that saying 'no' is in the provincial vocabulary".

Another regulator went so far as to suggest that denying a permit was not a legal option, and that "if [the applicants] meet the requirements of the Water Act and the restoration/compensation guide, there really is no mechanism for the Department to say 'no'".

The fact that the government rarely denies a wetland permit has created conditions where proponents skip over any serious consideration of avoidance (Clare et al. 2011), thus triggering a requirement for the compensation of 'unavoidable' impacts. This tendency to skip right to compensation was highlighted in an interview with an environmental consultant, who described their experience with the wetland approval process:

> "I skip to [compensation] right away, just because I've never encountered somebody saying 'no, don't touch this wetland'. If it changed to where people

> were like, 'no, don't touch this wetland', I might have a different mindset – but it just has never come up, so I always skip right to compensation."

In these cases, there appears to be a distinct preference for ILF payments over other forms of compensation, with the proportion of approvals requiring ILF payments as compensation steadily rising between 1999 and 2010 (Table 4-1).

Interestingly, the use of ILF payments increased substantially in 2005, and again in 2007 – years that correspond with the initial release, and subsequent revision, of the provincial compensation guidelines. As with other offset and trading programs, the option to allow for compensation, rather than prioritizing avoidance, provides regulators with an opportunity to say "yes, with conditions", without any practical option to deny an approval outright (Walker et al., 2009). Such conditions greatly favour industrial proponents who have the financial resources to compensate for wetland loss through an ILF payment, and can thus skip over avoidance in favor of compensation.

Table 4-1. The total number of Water Act approvals issued for wetland impacts in the White Area between 1999 and 2010, including the number and proportion of those approvals that required an in-lieu fee (ILF) payment as compensation. For ILF approvals with sufficient information, the minimum, maximum, and average distance between impact and compensation sites was calculated, in addition to the minimum, maximum, and average compensation ratio that was requested by the government.

	1999	2000	2001	2002	2003	2004	2005[1]	2006	2007[1]	2008	2009	2010
Approvals Issued (n=504)	38	29	41	35	24	24	29	25	45	66	63	85
Approvals Requiring ILF Payment (n=217)	0	2	0	4	2	4	11	8	29	45	47	65
Proportion (%) of Approvals as ILF	0	7	0	11	8	17	38	32	64	68	75	76
ILF Approvals with Sufficient Distance Information (n=146)[2]	0	2	0	2	2	2	6	3	22	37	38	32
Quarter Sections with Wetland Impacts (n=188)[3]	0	2	0	2	2	2	6	3	32	49	51	39
Minimum Displacement Distance (km)	N/A	71	N/A	69	71	73	14	48	4	4	9	22
Maximum Displacement Distance (km)	N/A	71	N/A	72	71	234	86	123	140	231	176	193
Average Displacement Distance (km)	N/A	71	N/A	71	71	154	55	91	52	95	92	102
ILF Approvals with Ratio Information (n=140)	0	2	0	2	2	2	4	3	22	37	37	29
Minimum Compensation Ratio	N/A	1:1	N/A	8:1	7.7:1	3:1	3:1	3:1	1:1	1:1	1.1:1	0.5:1
Maximum Compensation Ratio	N/A	1:1	N/A	8:1	7.7:1	3:1	5:1	4:1	6:1	3:1	4:1	3:1
Average Compensation Ratio	N/A	1:1	N/A	8:1	7.7:1	3:1	3.1:1	3.3:1	3.1:1	3:1	3:1	2.8:1

[1]The Provincial wetland compensation guidelines were first issued in 2005 and were subsequently revised without substantial changes in 2007.
[2]Sufficiant distance information included a location for both impact and compensation sites.
[3]Given that a single approval can include multiple impact locations, displacement distances were calculated for each unique location and averaged were calculated by year.

Slippage in Selection of Compensation Site Location

"Compensation should take place within the same watershed as the impacted wetland, or in a watershed close by" - Provincial Wetland Restoration/Compensation Guide (Alberta Environment 2007 p. 1)

Most jurisdictions that practice wetland compensation acknowledge that the arrangement of wetlands on the landscape can profoundly influence ecological and hydrological interactions (Hanski 1998; Gibbs 2000), as well as ecological function (Mitsch & Gosselink 2000). Consequently, there is a strong emphasis on locating compensation projects as close to the site of impact as possible, with a preference for impact and compensation sites to be located within the same watershed. While the compensation guidelines in Alberta clearly state such a preference, the practice of relocating wetlands outside the impacted watershed is commonplace.

According to data obtained from DUC annual reports, 80% of ILF payments made between 1999 and 2010 were directed towards restoration projects located outside the watershed of impact. The explanation for why there are such high rates of wetland relocation is quite simple: DUC, the only restoration agency that can accept ILF payments in Alberta, has organizational goals that prioritize wetland restoration in specific regions of the province (Alberta NAWMP Partnership Management Committee 2008). The result is an inventory of restored wetlands that is geographically restricted and rarely corresponds with localities where wetland impacts are most concentrated: near the major urban centers of Edmonton and Calgary. In addition, DUC faces an enormous challenge in securing wetlands on private land for restoration, a process that can take several years of negotiation. Thus, the inventory of wetlands that are suitable (by DUC standards) and accessible is limited, which leads to a spatial reorganization of wetlands (Figure 4-1).

These limitations and lack of concurrence between provincial wetland policy goals and DUC habitat management goals has been acknowledged by both organizations. To resolve this issue, the government and DUC have informally agreed that replacing wetlands within the watershed of impact is an unrealistic goal; instead, several key informants explained in interviews that DUC strives to replace wetlands within the same major river basin.

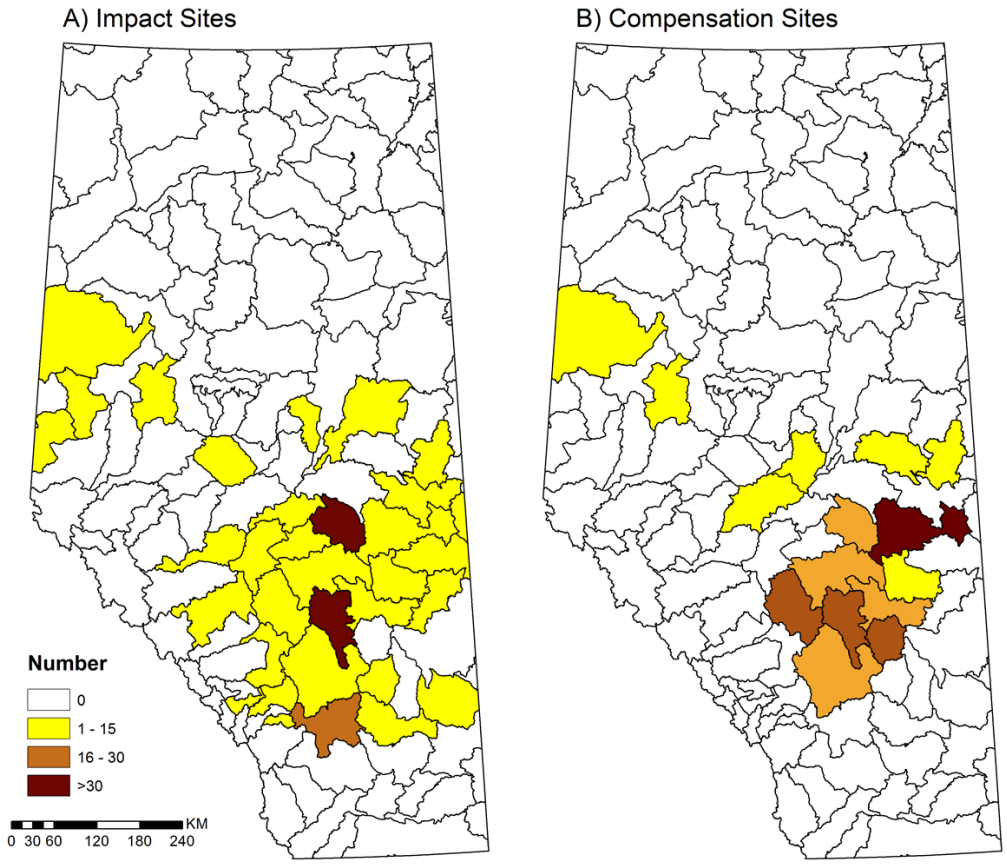

Figure 4-1. The distribution of wetland impact and compensation sites for impacts in the White Area between 1999 and 2010, summarized by subwatershed (n=188). The vast majority of compensation occurs outside of the watershed of impact (80%), which has lead to a to a spatial reorganization of wetlands across the landscape.

This decision was premised on the idea that the guideline places an *unreasonable* requirement on the proponent given the shortage of suitable restoration sites (personal communication, 2009). The lack of compensation sites was identified in interviews as being a major impediment to the ability of applicants to "move on with their development", and that if the proponent "had to wait to get these projects negotiated and built, they could be two or three years down the road" (personal communication, 2009).

The idea that this requirement would somehow restrict or place limits on development is considered to be untenable by both the regulators and the regulated community, and in order to ensure that ILF compensation remains a viable option for applicants who prefer this approach, the government has loosened the requirement for compensation to occur within the same watershed. The leniency of

both the government and the restoration agency in the interpretation and application of this guideline favors proponents with tight development timelines, who are not required to wait for compensation sites to become available within the watershed of impact.

Slippage in the Calculation of Compensation Ratios

"The maximum rate of compensation is 10:1 considering that most restoration sites should be in the 0 to 80 km range from the impacted site. However, exceptional circumstances would have to be evaluated separately and compensated accordingly" - Provincial Wetland Restoration/Compensation Guide (Alberta Environment 2007 p. 8)

This guideline introduces a minimum compensation ratio of 3:1, which should be applied to any project where the distance between the impact and compensation site ranges from zero (on-site compensation) to within 20 km. In circumstances where the displacement distance is between 20 and 80 km, the compensation ratio should increase linearly with distance, up to a maximum ratio of 10:1. Projects where the displacement distance is in excess of 80 km are considered to be "exceptional circumstances" warranting individual consideration, and presumably, compensation ratio in excess of 10:1. Thus, this sliding scale should provide an incentive to locate compensation sites as close to the site of impact as possible, with the majority of compensation occurring within 20 km at a replacement ratio of 3:1. Compensation located >80 km should be relatively rare, with corresponding compensation ratios of 10:1 or more.

Between 1999 and 2010, compensation sites were located within 20 km of the impact site in only 12% of cases, with the majority of approvals (49%) being categorized as an "exceptional" circumstance (>80 km). Further, when average compensation ratios are compared against average displacement distances, it is apparent that the government has not been applying the sliding scale to establish compensation ratios. While the average displacement distance generally increased between 2007 and 2010, corresponding compensation ratios decreased, with average compensation ratios in 2010 falling below the "minimum" ratio of 3:1 required under the guidelines (Table 3-1). While there were instances where regulators did ask for compensation above 3:1, this accounted for only 6% of cases, and the required compensation ratio was never in excess of 8:1. In the vast majority of instances (122 of 140 approvals: 87%), proponents were required to compensate

at the minimum ratio of 3:1; however, we did find cases (7 of 140 approvals: 5%) where proponents compensated at less than 3:1. In each case where compensation was less than the required "minimum" ratio, the displacement distance was in excess of 20 km, with two of these cases having displacement distances in excess of 140 km.

The rationale provided for why government regulators are not employing the sliding scale is linked to the same reason why compensation projects are being relocated outside the watershed of impact: a lack of "suitable" compensation sites, as articulated by one government regulator:

> "There are issues with the current Guide because there's that sliding scale with distance, and we haven't applied that sliding scale at all because Ducks Unlimited doesn't have enough sites. It doesn't seem fair to say you have to compensate 200 kilometers away if Ducks Unlimited only has one site - how is that reasonable? So we haven't been applying that 10:1 scale, we've just been applying 3:1."

This sentiment illustrates how many government regulators feel that they are responsible for ensuring reasonableness and fairness for proponents, rather than apply the compensation guidelines as written. By bartering less environmentally demanding wetland compensation requirements, regulators minimize both political costs for government and financial costs for proponents.

4.4.2 Mechanisms Driving Agency Capture & Bureaucratic Slippage in Alberta

While there is strong empirical evidence of bureaucratic slippage in the implementation of wetland compensation in Alberta, one important question remains: What mechanisms are driving the underlying agency capture in wetland policy implementation in Alberta? Drawing from the theoretical frameworks of Mitnick (2011) and Balla (2011), agency capture in this case appears to arise from both relational (i.e., internal and external relationships between regulators and the regulated) and individual (i.e., the interaction of individuals within the regulatory relationship) factors. Specifically, there is evidence to suggest that agency capture is driven by several interrelated mechanisms, including overhead governance and political control of the bureaucracy, and fragmentation of authority that has contributed to organizational goal ambiguity.

Overhead Governance & Political Control

In parliamentary systems such as Alberta, "the relationship between elected officials and bureaucrats is fundamentally shaped by the absence of a separation between legislative and executive powers" (Balla 2011 p. 78). As a result, politicians have the capacity to control agency design and oversight in ways that influence decision making and performance at various scales - from the level of the state where rules are made, down to individuals who act in decision making roles (Weingast & Moran 1983; Balla 2011; Mitnick 2011). Thus, the way in which delegated authority is managed through overhead control must be considered when evaluating agency performance, as this context can significantly shape the understanding of how and why decisions are made (Balla 2011; Christensen 2011; Croley 2011).

Overhead governance is a form of agency capture where industry influence is maintained through stable relationships with government, and this influence consistently shapes agency decision making and/or performance in ways that benefit industry (Mitnick 2011). Since the early 1970s, the political landscape in Alberta has been dominated by a single governing party, and there is compelling evidence to suggest that industry (and in particular, agriculture and oil and gas) has long enjoyed a close relationship with the governing conservative party (Davidson & Mackendrick 2004; Harrison et al. 2005; Urquhart 2005; Fluett & Krogman 2008; Davidson & Gismondi 2011; Clare et al. 2012). Overhead political control by the Executive Branch of government (i.e., Premier and Cabinet Ministers) appears to be particularly strong in the development and administration of environmental law and policy, as articulated by one Department of Environment employee who said:

> "I'm often given the opportunity to preview policy that is being developed, or to comment on policy, or even to be directly involved in writing policy. And that policy, as it's being written and developed, is always being reviewed at a higher level. If our politicians feel that we're getting off track, then we're reigned in. So yeah, there's direct political influence on the policy side of things."

The critical role that politicians play in shaping environmental policy in Alberta was further articulated by a bureaucrat working as an advisor in the Executive Branch of government:

> "In terms of policy … it's kind of a top-down and bottom-up dance. Ultimately the Minister calls the shots, and what gets decided here [in the Minister's

> office], and by Cabinet, and the broader [Progressive Conservation Party] caucus, gets implemented in the Department."

The power of politicians to direct what "gets implemented in the Department" includes an ability to influence the day-to-day decisions of front-line bureaucrats, as articulated by one government regulator, who described how they must contend with political influence when making regulatory decisions:

> "I work within a government that is made up of MLAs [Members of the Legislative Assembly] who represent their constituencies. So, if a landowner has issues with the regulator, it's not uncommon for them to contact their MLA, and then of course, that kind of pressure comes to bear to influence decisions. So, if you don't have a regulatory scheme that is well laid out, it's really open as to how those decisions get made."

It is well-documented that politicians may be motivated to influence department mandates or day-to-day regulatory decisions in order to gain political power, or to improve their chances of re-election (Balla 2011). Such politically motivated involvement in the day-to-day business of government departments was articulated by one government employee who described the impact that Cabinet Ministers can have on government departments:

> "Everything was political to him - we are still digging ourselves out of holes that that man dug, and he was our Minister for only a year. He didn't respect mandates. He turned everything political and wanted everything that he wanted, and that was at the absolute worst time because he was making a run for the [party] leadership. So, he was looking for every opportunity to endear himself to local politicians who might be in a position to support his leadership run."

Overhead control through agency oversight is also manifest in how the government allocates resources, both in terms of personnel and finances. The chronic under-resourcing of agencies responsible for managing wetlands in Alberta was a very common theme in interviews with government employees, who spoke about the difficulties associated with managing workloads under such conditions:

> "Half of our regulatory process, to be honest, is trying to manage workload, because we simply do not have the kind of resources to bring to bear on this."

When regulators are under-resourced and faced with complex and time-sensitive tasks, there is a tendency to simplify those tasks in cooperation with regulated

industries, which often results in reduced regulatory stringency (Mitnick 2011). For example, in interviews with regulators, they described how ILF payments make the approval process less complicated, and as a result, faster and easier to administer. The use of ILF payments thus allows regulators to more effectively manage their workload, and also benefits those in the regulated community who have the financial resources available to quickly resolve wetland issues that may be associated with their development.

Fragmentation of Authority & Organizational Goal Ambiguity

Fragmentation of government authority, which is the division of power through multiple ministries and departments with complex mandates (Bakker & Cook 2011), was identified in interviews with both regulators and the regulated community as being a major issue in the implementation of wetland policy in Alberta. This failure of agency design, where the roles and mandates of government departments are unclear or ambiguous, contributes to organizational goal ambiguity, which makes it difficult for regulators to act decisively when implementing law or policy (Chun & Rainey 2005; Balla 2011). Organizational goal ambiguity is defined as being "the extent to which an organizational goal or set of goals allows leeway for interpretation, when the organizational goal represents the desired future state of the organization" (Chun & Rainey 2005 p. 2).

Given that politicians continuously contend with multiple and conflicting interests, environmental law and policy is often ambiguous, with goals that are frequently oppositional or contradictory (Chun & Rainey 2005; Lee et al. 2010; Stazyk & Goerdel 2011). For example, both the *Water Act* and the interim wetland policy state environmental conservation and economic growth as priorities, and as one regulator pointed out in an interview, meeting both goals is difficult because "typically, if you're allowing something that will benefit the economy, it's at a detriment to the environment". In a province where the government relies heavily on resource royalties for revenue, and the political priority is clearly focused on creating favorable conditions for economic growth over environmental protection (Davidson & Gismondi 2011), contradictory law and policy can be an effective political device for supporting business-as-usual development. By creating priority goal ambiguity, conflicting law and policy creates room for regulators to maneuver,

dilute, and systematically interpret regulations in a way that favors regulated industries.

4.5. Conclusions

Trading programs such as the one examined in this study are becoming increasingly popular, given their promise as policy tools to 'balance' economic development against the loss of important natural assets. While there are significant challenges and flaws associated with trading programs, many advocates (and critics) contend that with careful attention to program design and sufficient compliance, these programs can help address conflicts between development and conservation (tenKate et al. 2004; Gibbons & Lindenmayer 2007). This assertion, however, fails to recognize the institutional context within which trading programs are developed, and how politics, power, and history can undermine even the most carefully designed trading program (Walker et al. 2009).

Freudenburg and Gramling (1994 p. 9) noted that "the devils is in the details" of policy implementation, and this study gives careful attention to how wetland compensation guidelines are being implemented in Alberta. Results reveal that the social practices around the implementation of wetland compensation guidelines tend towards selective enforcement or regulator acquiescence through nonenforcement of some of the most important guideline principles. For example, there is a general tendency to skip over any serious consideration of wetland avoidance in favor of using in-lieu fee payments as compensation. Wetland compensation sites are also frequently located outside the watershed of impact, with the average distance between impact and compensation sites typically exceeding what is considered reasonable under the guidelines, without a commensurate increase in compensation ratios.

These results illustrate that despite having very clear and explicit guidelines to help direct decision making, outcomes are influenced by a myriad of situational factors that cannot be addressed by simply designing 'better' trading programs and rules. Rather, the problems that lead to bureaucratic slippage, and ultimately policy failure, are fundamentally political and administrative in nature, and this agency context is rarely, if ever, considered in the design of trading programs. One step towards addressing such problems is to identify key criteria that can be quantified

and used to periodically assess the efficacy of wetland decision making and policy performance. The data should be systematically collected and made available to the public, and a quasi-governmental and independent review board could provide oversight for such a process. One of the key insights gained from this study is that gathering the data required to evaluate compensation outcomes in Alberta is exceptionally challenging, as the data are located in various forms and are held by a number of different agencies. In absence of a centralized repository for wetland approval data, it becomes exceptionally difficult to effectively, efficiently, and accurately evaluate compensation outcomes.

While this study focused on bureaucratic slippage in the case of wetland permitting in Alberta, these findings should give pause to policy makers in other jurisdictions who design environmental trading programs, as there is a very clear need for greater scrutiny of the normative, discursive, and incremental ways in which 'formal rules' are interpreted and implemented by front-line decision makers. Although bureaucratic discretion can ostensibly provide decision makers with license to develop more creative solutions to wetland management, the institutional practices in this case have encouraged bureaucratic slippage. Without acknowledging the institutional context within which decisions are made, and the opportunities for powerful actors to influence those decisions, there is little hope that environmental trading programs will deliver promised environmental outcomes.

4.6. Literature Cited

Alberta Environment. 2007. Provincial wetland restoration/compensation guide. Pages 1–21 Environmental Partnerships and Education Branch. Information Centre, Edmonton, AB, Can.

Alberta Hansard. 2010. 27th Legislature, 3rd Session, Monday, November 1, 2010, Afternoon. Legislative Assembly of Alberta, Edmonton, AB, Canada. Retrieved from http://www.assembly.ab.ca/ISYS/LADDAR_files/docs/hansards/han/legislature_27/session_3/20101101_1330_01_han.pdf.

Alberta NAWMP Partnership Management Committee. 2008. Alberta NAWMP Implementation Plan 2007-2012. Page 56. Alberta NAWMP Partnership. Retrieved from http://www.phjv.ca/pdf/Alberta%20NAWMP%20Implementation%20Plan%20FINAL.pdf.

Alberta Water Resources Commission. 1993. Wetland management in the settled area of Alberta: an interim policy. Pages 1–18. Alberta Water Resources Commission, Edmonton, AB, Can.

Bakker, K., and C. Cook. 2011. Water Governance in Canada: Innovation and Fragmentation. International Journal of Water Resources Development 27:275–289.

Balla, S. J. 2011. Institutional design and the management of regulatory governance. in D.

Levi-Faur, editor. Handbook on the Politics of Regulation. Edward Elgar Publishing Limited, Northampton, MA, USA.
Bernstein, M. 1955. Regulating business by independent commission. Princeton University Press, Princeton, NJ, USA.
Beyer, H. 2004. Hawth's Analysis Tools for ArcGIS. Retrieved from http://www.spatialecology.com/htools.
Burgin, S. 2010. “Mitigation banks” for wetland conservation: a major success or an unmitigated disaster? Wetlands Ecology and Management 18:49–55.
Christensen, J. G. 2011. Competing theories or regulatory governance: reconsidering public interest theory. in D. Levi-Faur, editor. Handbook on the Politics of Regulation. Edward Elgar Publishing Limited, Northampton, MA, USA.
Chun, Y. H., and H. Rainey. 2005. Goal Ambiguity in U.S. Federal Agencies. Journal of Public Administration Research and Theory 15:1–30.
Clare, S., N. Krogman, and K. J. Caine. 2012. The “Balance Discourse”: A case study of power and wetland management. Manuscript submitted for publication.
Clare, S., N. Krogman, L. Foote, and N. Lemphers. 2011. Where is the avoidance in the implementation of wetland law and policy? Wetlands Ecology and Management 19:165–182.
Coslovsky, S., R. Pires, and S. S. Silbey. 2011. The pragmatic politics of regulatory enforcement. in D. Levi-Faur, editor. Handbook on the Politics of Regulation. Edward Elgar Publishing Limited, Northampton, MA, USA.
Croley, S. P. 2011. Beyond capture: towards a new theory of regulation. Pages 50–69 in D. Levi-Faur, editor. Handbook on the politics of regulation. Edward Elgar Publishing Limited, Northampton, MA, USA.
Davidson, D., and M. Gismondi. 2011. Challenging Legitimacy at the Precipice of Energy Calamity. Springer.
Davidson, D., and N. Mackendrick. 2004. All Dressed Up with Nowhere to Go: The Discourse of Ecological Modernization in Alberta, Canada. The Canadian Review of Sociology and Anthropology 41:47–66.
Environmental Systems Resource Institute. 2010. ArcMap, 10.0. ESRI, Inc, Redlands, CA, USA.
FileMaker, Inc. 2007. FileMaker Pro. FileMaker Inc.
Fluett, C., and N. Krogman. 2008. Barriers to changing Alberta's oil and gas tenure system: Lessons from an oil dependent state. Projections: MIT Journal of Planning 8:120–139.
Freudenburg, W., and R. Gramling. 1994. Bureaucratic Slippage and Failures of Agency Vigilance: The Case of the Environmental Studies Program. Social Problems 41:214–239.
Gibbons, P., and D. B. Lindenmayer. 2007. Offsets for land clearing: No net loss or the tail wagging the dog? Ecological Management & Restoration 8:26–31.
Gibbs, J. 2000. Wetland loss and biodiversity conservation. Conservation Biology 14:314–317.
Government of Alberta. 2005. ATS V4.1. Government of Alberta. Retrieved from http://www.altalis.com.
Government of Alberta. 2012. Authorization Viewer, 1995-2012. Government of Alberta. Retrieved 2012, from http://environment.alberta.ca/01519.html.
Hanski, I. 1998. Metapopulation dynamics. Nature 396:41–49.
Hanson, J., and D. Yosifon. 2003. The situation: an introduction to the situational character, critical realism, power economics, and deep capture. University of Pennsylvania Law Review 152:129–346.
Harrison, T., W. Johnson, and H. Krahn. 2005. Language and power: “Special interests” in Alberta's political discourse. in T. Harrison, editor. The Return of the Trojan Horse: Alberta and the New World (Dis)Order. Black Rose Books, Montreal, QC, Can.
Krogman, N. 1999. Bureaucratic slippage in organizations responsible for protecting the environment: the case of wetlands regulation. Research in Social Problems and Public Policy 7:163–181.
Lee, J. W., H. G. Rainey, and Y. H. Chun. 2010. Goal Ambiguity, Work Complexity, and Work Routineness in Federal Agencies. The American Review of Public Administration

40:284–308.
Lipsky, M. 1980. Street-level bureaucracy. Russell Sage Foundation, New York, NY, USA.
McKenney, B., and J. Kiesecker. 2010. Policy development for biodiversity offsets: a review of offset frameworks. Environmental Management 45:165–176.
McSpirit, S., S. L. Scott, S. Hardesty, and R. Welch. 2005. EPA Actions in Post Disaster Martin County, Kentucky: An Analysis of Bureaucratic Slippage and Agency Recreancy. Journal of Appalachian Studies 11:30–59.
Mitnick, B. M. 2011. Capturing "capture": definition and mechanisms. in D. Levi-Faur, editor. Handbook on the Politics of Regulation. Edward Elgar Publishing Limited, Northampton, MA, USA.
Mitsch, W., and J. Gosselink. 2000. The value of wetlands: importance of scale and landscape setting. Ecological Economics 35:25–33.
PFRA/Agriculture and Agri-Food Canada. 2008. Environment Canada 4-Character sub-basins. Retrieved from http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1228407260356&lang=eng.
QSR International Pty Ltd. 2008. NVivo qualitative data analysis software.
R Development Core Team. 2011. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria.
Robertson, M. M. 2000. No net loss: wetland restoration and the incomplete capitalization of nature. Antipode 32:463–493.
Salzman, J., and J. Ruhl. 2000. Currencies and the Commodification of Environmental Law. Stanford Law Review 53:607–694.
Schneiberg, M., and T. Bartley. 2008. Organizations, Regulation, and Economic Behavior: Regulatory Dynamics and Forms from the Nineteenth to Twenty-First Century. Annual Review of Law and Social Science 4:31–61.
Stazyk, E. C., and H. T. Goerdel. 2011. The Benefits of Bureaucracy: Public Managers' Perceptions of Political Support, Goal Ambiguity, and Organizational Effectiveness. Journal of Public Administration Research and Theory 21:645–672.
Stigler, G. J. 1971. The theory of economic regulation. The Bell Journal of Economics and Management Science 2:3–21.
tenKate, K., J. Bishop, and R. Bayon. 2004. Biodiversity Offsets: Views, Experience, and the Business Case. Cambridge, London, IUCN. Insight Investment. International Union for Conservation of Nature and Natural Resources and Insight Investment Management (Global) Ltd, London, UK.
Thomas, D. R. 2006. A General Inductive Approach for Analyzing Qualitative Evaluation Data. American Journal of Evaluation 27:237–246.
Urquhart, I. 2005. Alberta's land, water, and air: Any reason not to despair? in T. Harrison, editor. The Return of the Trojan Horse: Alberta and the New World (Dis)Order. Black Rose Books, Montreal, QC, Can.
Walker, S., A. Brower, R. Stephens, and W. Lee. 2009. Why bartering biodiversity fails. Conservation Letters 2:149–157.
Weingast, B. R., and M. J. Moran. 1983. Bureaucratic Discretion or Congressional Control? Regulatory Policymaking by the Federal Trade Commission. The Journal of Political Economy 91:765–800.

CHAPTER 5

The 'Balance Discourse': A Case Study of Power and Wetland Management[18]

5.1. Introduction

Environmental issues are complex and their causes and effects are often factually uncertain and highly contested by social actors with competing interests. Under such conditions, individuals or groups with an economic, social, or cultural stake in achieving a particular outcome will often attempt to frame or define environmental problems and solutions in a way that best serves their interests. What emerges from this framing are discourses that are shaped through the production, transmission, and consumption of discursive elements (e.g., texts, symbols, images, etc.) that together reflect the ways in which socially constructed meaning has been given to an environmental problem (Hajer & Versteeg 2005).

Since 2005, there has been an on-going and often heated debate around wetland management and the development of a new wetland policy for the province of Alberta. During this time, the policy discourse that has dominated in the media and has been reflected in official Government of Alberta documents and publications is the claim that economic development must be balanced with wetland conservation. The ambiguity of this claim has created space for policy actors to

[18] *A version of this chapter has been submitted and is under review: Clare, Krogman, and Caine. 2012. Geoforum.*

present their own version of what 'balance' means, and thus, vie for political position to have their claims embraced by government in the development of a new wetland policy. A strong storyline that has emerged from this 'balance discourse' is that a 'one-size fits all' policy solution that seeks to maintain or increase wetland area is untenable. As a result, the 'balance discourse' represents voices that call for 'flexibility' in the development of a new wetland policy.

The objective of this study is to examine the prevailing public discourse around the need to 'balance' economic development with wetland conservation in Alberta – two priorities that are ubiquitously juxtaposed against each other in popular media and political commentary. Within the continuously expanding neoliberalization of environmental governance in Alberta (Timoney and Lee 2001; Davidson and Gismondi 2011), this research seeks to understand what balance means to key policy actors, in order to better understand the existing power relations that have brought about, and continue to support, the prevailing 'balance discourse'. In Section5.2, the power theories that have been used to inform this work are outlined. This section is followed in Section 5.3 by a description of the political history and neoliberal context within which the wetland policy debate is unfolding in Alberta. Section 5.4 describes the Q methodology that was employed to interrogate what 'balance' means to key policy actors as it relates to their worldview on wetlands and their perspectives on what role the government should play in the management of wetland resources in Alberta. Section 5.5 presents the results of the discourse analysis, and examines the position of key actors within the discourse to better understand how power relations are structured between wetland policy actors. Finally, the findings and implications of this work are discussed in Section 5.6.

5.2. Theoretical Framework

This study is informed by the idea that power is both structural and agent-based, and that it exists in multiple dimensions, operates at multiple scales, and is manifest and mobilized through decision-making practices. Through a bricolage of power theories, this work seeks to illuminate how access to authority leads to privileged and dominant discourses that largely go unchallenged by the public (Ribot & Peluso 2003; Freudenburg 2005). In turn, these hegemonic discourses

become naturalized and operate as a structure of knowledge that can influence decision making and daily practices of key actors (Rossi 2004; Freudenburg 2005). The mechanisms through which these knowledge structures operate to influence individual perceptions and behaviors is somewhat contested by scholars, but most agree that discourse serves as a means through which subordinate individuals may become controlled or dominated by more powerful actors (Scott 1990; Hajer & Versteeg 2005; Lukes 2005). This domination can be overt and observable, but often takes more subtle, unconscious, or 'thin' forms (Scott 1990), making it difficult to measure and observe.

Access as defined by Ribot and Peluso (2003 p. 153) is "the ability to benefit from … material objects, persons, institutions, and symbols", and has been recognized as being critically important in the formation of socially structured power relations that serve to establish and maintain control over natural resources (Ribot & Peluso 2003; Freudenburg 2005; Poteete & Ribot 2011). Through privileged access to authority, actors can control the production and transmission of discursive elements that re-make and/or re-enforce political, economic, or cultural frames that define an issue in the public sphere. Thus, privileged access can lead to privileged accounts or dominant discourses that legitimize and naturalize disproportionate access to both authority and natural resources (Freudenburg 2005). Once established, privileged accounts can become hegemonic, thereby influencing how an environmental problem is defined in the political sphere, the media, or the policy arena. These privileged accounts narrow the definition of who has a "legitimate" stake in formulating solutions to the problem, and indeed, can confine the nature of the solutions themselves (Hisschemoller & Hoppe 1995; Freudenburg 2005).

5.3. Wetland Management in Alberta: Background and Context

Privileged access to higher levels of political authority and the ability of powerful actors to dominate public discourse has been a largely unspoken, yet central feature, of the development of a new wetland policy in Alberta. In 2005, the Alberta Water Council (AWC), a non-government, not-for-profit, multi-stakeholder group made up of 25 members representing government, industry, and non-governmental organizations, struck the Wetland Policy Project Team (WPPT) to

develop recommendations for a new provincial wetland policy. This new policy would replace the existing "interim" policy, which applies only to the central and southern "settled" regions of the province (~40% of the province). Using a consensus-based approach, the WPPT negotiated for nearly three years to arrive at a policy recommendation and implementation plan that would apply to wetland management province-wide, including northern Alberta where vast areas of ecologically sensitive peatlands overlap with economically important bitumen deposits.

The WPPT submitted their final consensus recommendations to the AWC Board of Directors in June of 2008. At that time, the Board deferred taking the documents forward to government until September of 2008, to allow for WPPT members to ratify the documents within their sectors. In July of 2008, the Alberta Chamber of Resources (ACR) and the Canadian Association of Petroleum Producers (CAPP), who represented the interests of the mining and the oil and gas sectors on the WPPT, submitted letters of non-consensus. This last-minute withdrawal of support for the policy recommendations was seen by many members of the WPPT as an effort by industry to co-opt a legitimate, publicly endorsed policy process that had the potential to constrain future opportunities for industrial development in northern Alberta and increase costs over the business–as-usual approach (Bennett 2008).

The 'need for balance' and the potential cost of compensating for wetland loss were two issues brought forward by ACR and CAPP in their letters of non-consensus. Both organizations unequivocally rejected 'no net loss' of wetland area as a policy objective because it "could pose a significant financial barrier to investment" (ACR 2008 p. 3). The "significant" financial cost of replacing wetland area at a 1:1 ratio was estimated to be a one-time cost of "anywhere between $170 million and $560 million", implying a serious financial risk to both the industry and the economy (ACR 2008 p. 3). Upon closer scrutiny, this cost appears to be neither significant, nor risky, when the financial profits of companies that operate in Alberta's oil sands region are examined. For example, in their 2011 "Message to Stakeholders", Suncor Energy reported a near doubling of annual operating earnings to a record $5.07 billion (Suncor Energy Inc. 2011), and Syncrude Canada's retained

earnings from 2007 to 2009 ranged between $2.62 and $4.17 billion (Syncrude Canada Ltd 2009).

When seen in this context, the projected costs (as calculated by industry themselves) of wetland compensation does not appear to present an unreasonable financial burden for oil and gas companies operating in northern Alberta, and certainly challenges the notion that a more robust wetland policy will unduly impact economic prosperity in the province. Yet, the idea that wetland compensation is "too expensive" and poses a "threat" to economic prosperity has become a privileged account that has gone largely unchallenged. Media headlines asserting "*Oilsands firms balk at wetlands policy; 'No net-loss ' rule could cost oil producers billions*" (Cryderman 2008) have only contributed to an on-going wetland policy debate that publically pits wetland conservation against economic prosperity.

Since the very public rejection of the wetland policy recommendations by industry in 2008, the Alberta government has continuously delayed the release of a new wetland policy through non-decision making (Bachrach & Baratz 1970), despite frequent public commitments asserting that the release of a new policy is imminent. This delay seems to be related, at least in part, to the government's sensitivity to the issues brought forward by industry in their letters of non-consensus, as evidenced by the Minister of Environment's statement in the Legislative Assembly in November 2010, more than two years after industry rejected the wetland policy recommendations:

> "We had a recommendation that came from the Alberta Water Council that provided us with a tremendous amount of detail and advice, and we have accepted all of the consensus recommendations. On one of the non-consensus recommendations we have asked for some further review and further study" (Alberta Hansard 2010 p. 1027)

When pressed on this issue by a member of the opposition party, who suggested the Minister of Environment had "backed down once again to his friends in big oil and mining", the Minister responded by saying:

> "We had a report that came from an organization that [was] asked to try and reach a consensus. A consensus means that all of the affected parties are able to live with it … in this particular case there was a non-consensus. Not all of the parties could live with the results. It's up to [the government] now to try and figure out a system that will allow all of the parties to be involved." (Alberta Hansard, 2010 p. 1028)

The fact that the government has delayed the release of a new wetland policy over industry concerns has deeply angered members of the environmental non-governmental organization (ENGO) community, who maintain that they made major concessions so that a "consensus" recommendation could be reached by the WPPT. While members of the ENGO community negotiated in good faith as part of an open and transparent process, they feel that the withdrawal of industry after a "consensus" had been reached was part of a political tactic, as explained by one member of the WPPT who said:

> "When [industry] feels backed into the corner they want to get out of that process as quickly as possible and reignite debate at the political level, because they feel that they have a much greater chance of success at that level than if they're just another stakeholder at a broad table. In fact, that's what I think they did at the Alberta Water Council table. I think that's why the non-consensus came, because they thought, 'Hey, we can get a better deal if we go political with this.' So they opted out of the consensus process and went to the politicians, and so far I think you would have to say that it's working rather well for them".

Since the rejection of the WTTP recommendations by industry in 2008, the discourse that has emerged in the media and in official government documents is a privileged account that maintains wetland conservation should be 'balanced' with economic growth. Underlying this 'balance discourse' is a very clear and ominous warning: wetland conservation will be expensive and will jeopardize economic growth, which in turn, will negatively impact the well-being of citizens (Cryderman 2010). This storyline was initially constructed by industry, but appears to have gained traction with the Alberta government, as jobs and the economy rank high amongst issues that are most salient to politicians when the environmental impacts of development are questioned by critics (Fluett & Krogman 2008). When challenged in the Legislative Assembly on whether the government is placing economic interests ahead of wetland protection, the Minister of Environment responded by saying:

> "Unfortunately, this is one of those subjects that tends to take on a black-and-white or an either/or focus. Frankly, that's not the case in this instance, nor is it the case in most instances. What we are looking at is a way that we can maintain that kind of balance. How can we continue to have economic growth and protect the environment at the same time?" (Alberta Hansard 2010 p. 1027)

Thus, the 'balance discourse' has become a political device that has gained prominence in the policy debate, and has served to characterize the issue of wetland conservation in a way that has created a discursive coalition between two very powerful policy actors (Rossi 2004; Hajer & Versteeg 2005): the oil and gas industry and government. As other energy discourse analysts have noted, when a discourse becomes captured by two key powerful players, alternative notions of the core set of problems, solutions, and legitimate actors can be considerably narrowed (Davidson & Gismondi 2011). For example, voices calling for a new wetland policy that places limits on wetland loss in Alberta, or those that insist on a greater than 1:1 replacement ratio for wetlands impacted by development, are seen as unbalanced and unreasonable. The result has been a very public conflict that has played out in the media. Headlines such as "*Alberta eco-groups/oilpatch part ways on proposed wetland policy*" (Bennett 2008) and "*Green groups attack province's 'weak' wetland policy*" (Audette 2010) reinforce the perception that these various coalitions are dichotomously positioned along political and ideological lines, and that groups calling for limits to growth or adequate compensation for wetland loss are unreasonably placing wetland conservation ahead of economic prosperity.

This 'balance discourse' is embedded within a larger provincial petro-culture where privileged access by the oil and gas industry has become naturalized, despite environmental law and policy that allows for greater protection and conservation of wetlands. While the influence of industry can be seen in the day-to-day decisions made by government, it is unclear how industry access in the political arena, as described above, is manifest in the subjective perspectives of key decision makers around how, and in whose interest, wetlands should be managed in Alberta. Through the use of Q methodology, this study strives to uncover whether key government decision makers subscribe to the dominant public discourse of 'balance', and where key decision makers are positioned within the discourse relative to one another.

5.4. Methods

5.4.1 Overview of Q Methodology

Developed by psychologist and physicist William Stephenson in the 1930s, Q methodology is an increasingly popular approach to discourse analysis, particularly in relation to highly contentious subjects such as environmental policy (Niemeyer et al. 2005; Robbins 2006; Rutherford et al. 2009; Chamberlain et al. 2012). The main strength of Q methodology is the ability to identify and explore shared perceptions, or social discourses, in a more structured way than can be achieved with other methods of discourse analysis (Barry & Proops 1999). Through factor analysis, study participants are grouped together based on correlations among viewpoints, with each factor representing a distinct perspective within the larger social discourse. Thus, Q methodology allows researchers to better understand the multiplicity of viewpoints that make up the larger discourse, and gives voice to marginalized or powerless groups whose perspectives may be lost within the dominant discourse. Q methodology can also be used to better understand 'decision structures' (Durning & Brown 2007) that influence past and future decisions of key policy actors, and can facilitate the search for compromise and common ground in seemingly intractable policy discussions (Brown et al. 2007). For a more thorough description of Q methodology, see Brown (1980).

5.4.2 Study Design

This study was informed by 34 semi-structured interviews conducted with a range of policy actors representing government (municipal, provincial, and federal; 17 interviews), not for profit environmental groups (5 interviews), consultants (6 interviews), and industry (oil and gas, land developers, agriculture; 6 interviews). Interviews were transcribed and inductively coded by a single researcher into conceptual themes using NVivo (QSR International Pty Ltd. 2008). Initial coding revealed a very strong discursive element related to the perceived need to "balance" industrial development and wetland management. This emergent theme became the focus of the subsequent Q study.

Interview data were secondarily sorted to extract a concourse of 90 statements that were representative of the range of values and viewpoints expressed by the 'balance discourse'. From this concourse, a final set of 36 statements (the 'Q set') was selected using a factorial design (Brown 1970; Brown &

Ungs 1970). The factorial design consisted of two main axes of inquiry that were dichotomous in nature, and included 18 statements that were reflective of values associated with how wetlands should be managed (i.e. biocentric vs. anthropocentric worldview) and 18 statements related to wetland governance (i.e. social democratic vs. neoliberal worldview), as informed by the statements selected from interview data.

Study participants were asked to rank order ('Q sort') the statements according to how well each statement represented their organization's perspective. If participants felt they could not sort the statements from their organization's viewpoint, they were instructed to sort the statements from their own personal perspective. Only one individual indicated that the statements were sorted according to their personal perspective. Participants placed the cards onto a sorting sheet with 36 boxes arranged in a quasi-normal distribution of nine columns (2,4,4,5,6,5,4,4,2) that ranged from -4 (least representative) to +4 (most representative). After the cards had been placed on the sorting sheet, participants reviewed the card placement and rearranged the cards, if required. Once satisfied with the sort, participants filled out an open-ended questionnaire that briefly narrated the rationale of their sort. These questionnaires were subsequently used to assist with data analysis.

The Q sort exercise took place at a workshop with 31 invited participants that took place in Edmonton, Alberta, in March of 2011. Five participants who could not attend the workshop were also included in the study, and Q sorts for these individuals were administered in person (one participant), or materials were mailed out and the sort was self-administered (four participants). In total, 36 key informants from Industry (8 individuals), Environmental Non-Governmental Organizations (ENGOs) (8), and the federal, provincial, and municipal government (20) completed a Q sort. Of those participants who completed the Q sort, a total of 11 individuals had previously participated in semi-structured interviews. The additional key informants were invited to participate in the Q sort because they held key decision-making roles within their organizations and were experts in issues of wetland management in Alberta. Key informants from the provincial government were intentionally over-sampled (Robbins 2006) because this group included participants from various government departments (e.g., Environment, Sustainable

Resource Development, Transportation, Agriculture) that all have very different mandates with respect to wetland management in the province.

Q sorts were analyzed using PQMethod 2.11 (Schmolck & Atkinson 2002) and data were factor analyzed using Principle Components Analysis. The unrotated factor solution was used because all participants significantly loaded on the first factor; thus, applying varimax rotation would have resulted in an undesirably high factor correlation (Brown 1981; Kreider 2009). Factors were retained if two or more participants significantly loaded ($p>0.01$, critical loading=0.43) on a factor with an Eigen value >1.

5.4.3 Non-metric Multidimensional Scaling

Most Q studies are focused on uncovering the discourses or perspectives represented by each factor, and are less concerned with questions concerning which participants associate together on a given factor. However, we feel that the patterns associated with how (dis)similar participants' viewpoints are may reveal insights into how power operates in the formation and expression of wetland policy discourses. The formation of clusters represents groups of individuals who share a similar discourse, and these clusters may indicate either discursive conformity or discursive coalitions between actors (Rossi 2004). Consequently, giving attention to the composition of these discursive clusters gives insights into how power may be operating to produce dominate discourses. Thus, we employed a non-metric multidimentional scaling (NMDS) analysis to explore the structure in the Q sort data. Using a Euclidean distance model with a minimum and maximum dimension of 2, the NMDS was performed with the "ecodist" package (Goslee & Urban 2007) in the statistical software R (R Development Core Team 2011).

5.5. Results

Four distinct discourses (Factors, 1, 2a, 2b, and 3) emerged around the questions of how, by whom, and for whom economic prosperity and wetland conservation should be balanced in Alberta. Each factor represents a group of two or more participants who sorted their statements similarly, and thus share a common perspective. Factor 2 emerged as bipolar, meaning that the perspectives represented by this factor were directly opposite; consequently, these opposing viewpoints were separated and retained as two discrete factors (2a and 2b). Factor

loadings (Table 5-1) indicate how closely each participant's individual Q sort resembled the 'ideal' sort, i.e., the weighted representation of those participants whose Q sorts were most highly associated with each factor or discourse, with higher factor loadings indicating greater agreement between the respondent's sort and the ideal sort (Brown 1980; Brown et al. 2007). Factor scores (Table 5-2) indicate the ranking of each statement within the ideal sort for each factor.

Table 5-1. Study participant factor loadings[a] for each of the unrotated PCA factors extracted from Q sorts related to perceptions about wetlands and wetland management in Alberta.

Participant & Organizational Affiliation		Factor			
		1	2a	2b	3
1	ENGO	**0.78**	**-0.43**	**0.43**	0.05
2	ENGO	**0.83**	-0.35*	0.35*	-0.12
5	ENGO	**0.81**	**-0.44**	**0.44**	0.06
13	ENGO	**0.80**	-0.36*	0.36*	0.07
19	ENGO	**0.75**	-0.29	0.29	0.02
21	ENGO	**0.52**	**-0.71**	**0.71**	0.18
29	ENGO	**0.81**	-0.10	0.10	0.04
30	ENGO	**0.81**	-0.33*	0.33*	0.08
6	Industry	**0.59**	**0.68**	**-0.68**	0.16
27	Industry	**0.45**	**0.53**	**-0.53**	**0.50**
24	Industry	**0.76**	0.39*	-0.39*	-0.17
32	Industry	**0.72**	**0.53**	**-0.53**	-0.03
33	Industry	**0.49**	**0.48**	**-0.48**	-0.09
15	Industry – Consultant	**0.86**	0.02	-0.02	-0.03
16	Industry – Consultant	**0.90**	-0.10	0.10	0.24
23	Industry – Consultant	**0.68**	-0.33*	0.33*	0.12
7	Government – Environment & SRD	**0.81**	0.08	-0.08	0.08
8	Government – Environment & SRD	**0.80**	-0.15	0.15	-0.25
12	Government – Environment & SRD	**0.87**	0.15	-0.15	0.03
14	Government – Environment & SRD	**0.81**	-0.05	0.05	-0.18
17	Government – Environment & SRD	**0.82**	0.10	-0.10	-0.27
20	Government – Environment & SRD	**0.59**	0.16	-0.16	-0.36*
22	Government – Environment & SRD	**0.48**	0.42*	-0.42*	0.28
28	Government – Environment & SRD	**0.74**	-0.27	0.27	-0.27
35	Government – Environment & SRD	**0.75**	0.06	-0.06	-0.36*
36	Government – Environment & SRD	**0.67**	**0.49**	**-0.49**	0.01
11	Government – Environment & SRD	**0.81**	0.33*	-0.33*	-0.09
18	Government – Environment & SRD	**0.57**	**-0.57**	**0.57**	0.27
26	Government – Environment & SRD	**0.83**	0.08	-0.08	0.03
10	Government – Other	**0.63**	-0.10	0.10	-0.08
25	Government – Other	**0.79**	0.17	-0.17	0.01
3	Government – Other	**0.81**	0.11	-0.11	0.08
4	Government – Other	**0.74**	-0.05	0.05	**0.47**
9	Government – Other	**0.83**	0.30	-0.30	0.14
31	Government – Other	**0.55**	0.07	-0.07	-0.004
34	Government – Other	**0.83**	-0.08	0.08	-0.22
	Variance Explained	55%	11%		4%
	Significant Loadings (p<0.01)	36	9		2
	Eigen Values	19.71	4.00		1.42

[a] *Factor loadings indicate the extent to which each participant's individual Q sort was similar or dissimilar to the 'ideal' Q sort (the weighted representation of the sorts of those participants who were most highly associated with each factor). Factor loadings in boldface are significant at p<0.01 (critical loading = 0.43) and loadings denoted with * are significant at p<0.05 (critical loading = 0.33).*

Table 5-2. Q statements and factor scores[a] for each distinct discourse identified as factors 1 ("Public Good"), 2a ("Business as Usual"), 2b ("Concerned Conservationist"), and 3 ("Incentives-Based Conservation") in a Q method study of perceptions around wetlands and wetland management in Alberta, Canada.

Statement		Factor[b]			
		1	2a	2b	3
S1.	Alberta's breakneck pursuit of developing its non-renewable energy resources is irrational and unsustainable	-1	-4	+4	+3
S2.	Wetlands have intrinsic value and we should not be placing an "economic value" on these ecosystems	-1	-3	+3	-1
S3.	The Alberta government consistently puts corporate profits ahead of environmental protection	-1	-3	+3	+4
S4.	The government should reward citizens and corporations that voluntarily protect or conserve wetlands	1	+3	-3	+3
S5.	Creating the best possible environment for business should be the number one priority of the Alberta government	-2	+3	-3	0
S6.	Wetland loss is an unavoidable outcome of economic development in Alberta	-1	+2	-2	-2
S7.	Providing incentives for wetland protection would result in better outcomes than regulation and sanctions for non-compliance	0	+3	-3	+4
S8.	The government should not be interfering and telling people how to manage wetlands on private land	-3	+1	-1	+3
S9.	Albertans need to speak out more and tell their politicians what they want, and then hold them accountable	0	-1	+1	+1
S10.	The government should not interfere in the free market by adopting restrictive environmental policies	-3	+4	-4	+2
S11.	The majority of Albertans have expressed a desire to have a more comprehensive wetland policy, and if this was a true democracy, we would have a new wetland policy in place by now	-1	-3	+3	0
S12.	If we are serious about maintaining and protecting wetlands in Alberta, we need stronger laws and regulations	+1	-4	+4	-3
S13.	Wetlands are integral to our economic prosperity because they provide goods and services such as water filtration and recreation	+3	-1	+1	+3
S14.	Alberta is a resource extraction economy, and nothing should get in the way of the development of our natural resources	-4	+1	-1	-3
S15.	The oil and gas industry is critical to the economic well-being of Alberta because it creates jobs for citizens and revenue for the government	+2	+2	-2	-4
S16.	A robust wetland policy is not going to destroy the Alberta economy	+3	0	0	-1
S17.	The Alberta government should not protect any wetland that has oil under it	-4	0	0	0
S18.	Economic instruments, such as wetland banking and conservation off-sets, are policy tools that should be used to manage wetlands in Alberta	+2	+2	-2	+2
S19.	We have reached a critical threshold of wetland loss in Alberta	+1	-2	+2	+1
S20.	Corporations should only be accountable to their shareholders	-3	0	0	-1

continued

Table 5-2. (continued.)

Statement	Factor[b]			
	1	2a	2b	3
S21. There are many ways to arrange our economy so that we can be prosperous and still have healthy, functioning wetlands	+3	+2	-2	+1
S22. We all value the prosperity of our society, but it should not come at the expense of wetlands	+1	-2	+2	-3
S23. At the end of the day, people are motivated by dollars and cents	0	+1	-1	+2
S24. If you want more progressive environmental policies in Alberta, you have to elect a different government	-2	-2	+2	0
S25. Avoidance should be the only policy tool that we use to manage wetlands in Alberta, otherwise, wetland loss will continue	-2	-2	+2	0
S26. Certain wetlands should be classified as key ecosystems and these should be prioritized for protection	+3	0	0	+1
S27. As individuals, we are responsible for our actions, so we should stop blaming the government and industry for all of the environmental problems in Alberta	0	+1	-1	0
S28. The social and economic well-being of the province is dependent on a healthy environment	+4	-1	1	+2
S29. Corporations should have a say in the formation of environmental policies that may limit their profits	0	+3	-3	-2
S30. We need to set limits on wetland loss in Alberta, and we should not go beyond those limits	1	-3	+3	-4
S31. Because wetlands are a public good, wetland policy should serve the interests of the public, rather than the interests of a few small groups	+2	-1	+1	-1
S32. Alberta is known as a jurisdiction that is friendly to business, but this reputation should not come at an environmental cost	+2	-1	+1	+1
S33. In economic hard times, the priority should be the economy, not the environment	-3	+1	-1	-2
S34. Because there is no "one size fits all" solution to wetland management in Alberta, there is a need for flexibility in policy	+4	+4	-4	-2
S35. The government should allow private interests to develop their own targets and standards for wetland conservation	-2	0	0	-3
S36. All stakeholders should have equal access to the Minister of the Environment when it comes to expressing opinions about wetland policy	0	0	0	-1

[a] *Factor scores indicate how each statement was ranked (+4 to -4) within the 'ideal' Q sort representing each discourse.*

[b] *Each factor represents a discourse composed of a group of participants who sorted the statements in a similar way.*

Factor 1: "Public Good" - Wetlands are a public good that should be managed with a more robust policy

The first factor emerged as a "consensus" factor (Brown 1981; Kreider 2009) with all 36 participants positively and significantly loading ($p<0.01$) (Table 5-1). Of those participants who loaded on Factor 1, a total of 10 were confounded, i.e., significantly loaded on more than one factor, with one participant significantly loading on all four factors.

Statements that characterize the discourse captured by Factor 1 (Table 5-2) include those that generally acknowledge the important contribution that wetlands make to the quality of life in Alberta, including a recognition that the social and economic well-being of society is dependent upon a healthy environment (S28). The views in this factor strongly support the notion that a more robust wetland policy will not have an undue negative impact on the economy (S16), and that healthy, functioning wetlands and a strong economy are not mutually exclusive (S21). This factor also converged around the idea that wetlands are a public good (S8 and S31), and that corporations should give more consideration to the public interest when making business decisions (S20). The idea that resource extraction, and specifically oil and gas production, should be allowed to proceed unimpeded (S14 and S17) was rejected, and there was agreement that limits should be placed on development through identifying and protecting key wetland ecosystems (S26).

The emergence of a consensus factor suggests that there was fundamental agreement amongst all participants on key components of the discourse, with the remaining factors representing specificities, or sub-themes, within the discourse (Brown 1981). This consensus factor very clearly acknowledges the important values that wetlands contribute to the public good and the economy; however, other than supporting the idea that a more robust policy would not unduly impact the economy, this factor was silent on the questions of how wetlands should be managed, and by whom. It is these issues that emerged as specificities of Factor 1, with a clear divergence in perspectives and opinions that were strongly influenced by organizational affiliation.

Factor 2: The role of government in managing wetlands

The discourse captured by Factor 2 focused primarily on questions around how wetlands should be regulated, who should be responsible for regulation, and

whose interests should be served by such regulation. This factor reflects a fundamental disagreement between business interests that endorse the 'status quo' neoliberal approach to minimal government regulation (Factor 2a), and those who are concerned because they feel a critical threshold of wetland loss has been reached, and thus endorse the use of stronger policy, law, and regulation to manage and conserve wetlands (Factor 2b).

Factor 2a: "Business as Usual" - Neoliberalization of wetland management

Distinguishing statements for Factor 2a (Table 5-2) included those that strongly endorse the idea of minimal government intervention in environmental regulation (S10), as well as a more significant role for private interests in the formation of environmental policy that could negatively impact corporate profits (S29). The notion that stronger wetland laws and policy are needed to better manage wetlands was rejected (S12); rather, respondents who loaded on this factor felt that less focus should be placed on regulation or sanction for non-compliance, and more should be placed on creating incentives for wetland protection (S7). Those who loaded on this factor felt that the current rate of wetland loss is not a concern (S19), and that these losses are an unavoidable and necessary outcome of economic development (S6). There was also strong disagreement with statements suggesting that the current rate and pace of development in the province is unsustainable (S1), or that limits should be placed on any future wetland loss (S19).

Respondents whose views were most closely aligned with this discourse were either industry representatives or government personnel (Table 4-1). All those who loaded significantly and positively on this factor also loaded significantly but negatively on Factor 2b.

Factor 2b: "Concerned Conservationist" - Stronger law and policy required to prevent wetland loss

Underlying this discourse is the sentiment that existing wetland laws and policies in Alberta need to be strengthened (S12), with strong rejection of the idea that wetland policy should be more flexible (S31), or that corporations should play a larger role in the formation of environmental policy (S29; Table 5-2). This discourse was also characterized by strong concern over the status of wetlands in Alberta. Respondents felt that a critical threshold of wetland loss has been reached (S19), that limits need to be set on future losses (S30), and that avoidance should be used

as the primary management tool (S25) over other tools, such as economic instruments (S18) or incentives (S7). People who positively loaded on this factor also expressed a general mistrust of the government, strongly agreeing that the government has not acted democratically in the on-going policy development process (S11), and supported the notion that the existing government needs to be replaced before more progressive environmental policies can be adopted (S24).

Those who positively loaded on this factor were either representatives of ENGOs or worked for another organization in a role related to wildlife or habitat management. All those who loaded positively on this factor also significantly and negatively loaded on Factor 2a (Table 5-1).

Factor 3: "Incentives Based Conservation" - Protection of private property rights and incentives for wetland protection

Factor 3 represents a discourse characterized by conservative political values, with a particular focus on the protection of private property rights (S8; Table 5-2). Similar to the "business as usual" discourse (Factor 2a), this perspective favours the use of incentives over regulation or sanction for non-compliance as a mechanism for wetland conservation (S7, S10, and S12), and accepts wetland loss as a necessary condition for prosperity (S22), with a rejection of the idea that limits need to be placed on future wetland loss (S30). This discourse differs from Factor 2a, however, in important ways; for example, respondents who loaded on this factor do not think that corporations should be given more power in the policy making process (S29), and they strongly reject the notion that the oil and gas industry is critical to the economic well-being of Alberta (S15).

(Dis)similarity between Key Policy Actors

The NMDS revealed three distinct groups of individuals who sorted their statements similarly: one cluster comprised of respondents with an 'industry' affiliation, a second cluster made up of individuals with an 'ENGO' affiliation, and a small cluster of individuals with a 'consultant' affiliation (Figure 5-1). As one might expect, the industry cluster and the ENGO cluster were located the furthest apart in the ordination, while the consultants were located between these groups. Those with a 'government' affiliation were scattered throughout, with some individuals being located closest to the ENGO cluster, and others being located very near to the industry cluster. Those individuals in government that were located closest to the

industry cluster were of particular interest, as many of these individuals were considered to be acting in key decision making roles.

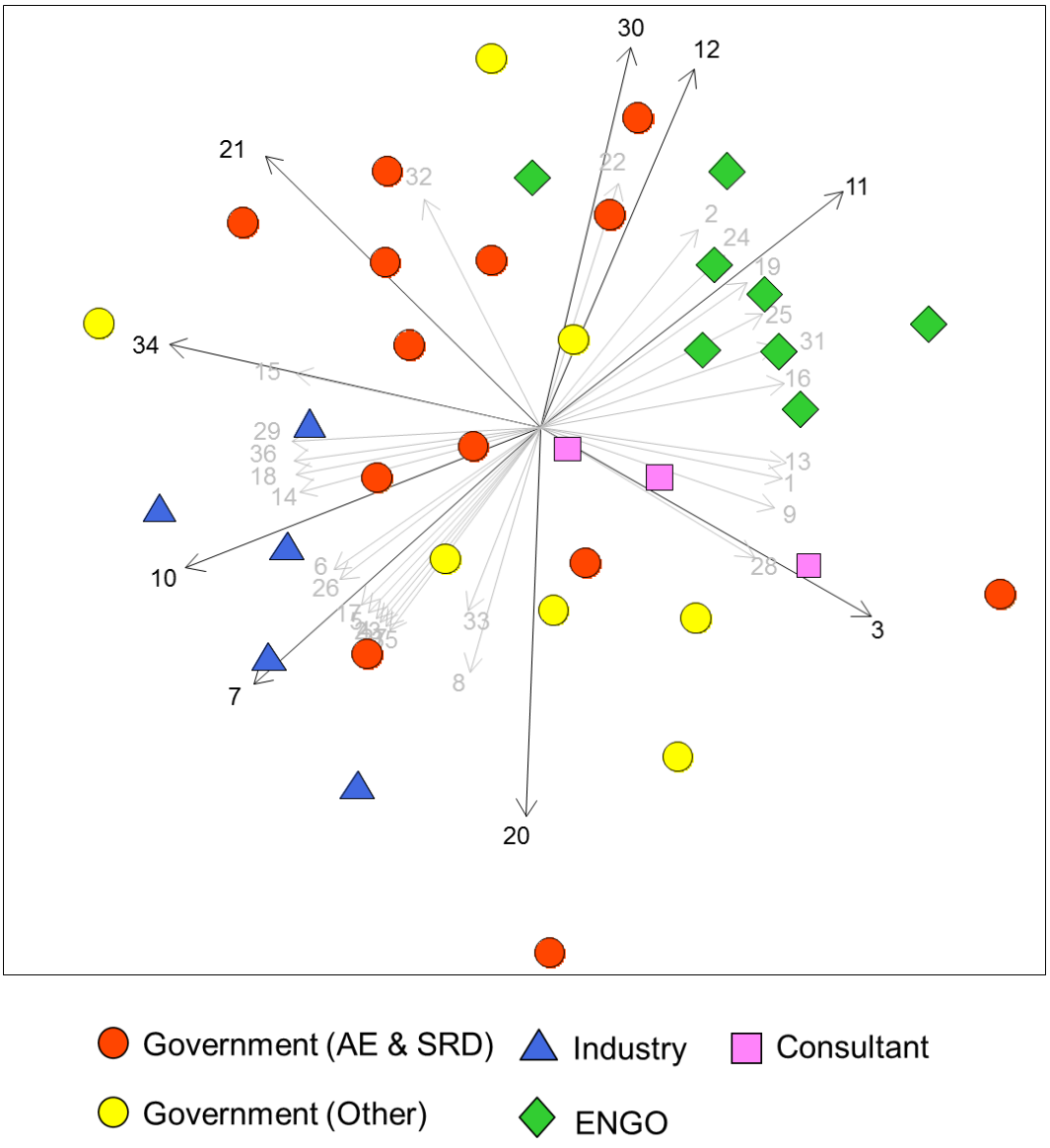

Figure 5-1. Non-metric multidimensional scaling (NMDS) results from Q-sort data, showing how the various key policy actors are positioned relative to one another. The arrows and numbers indicate the statements that characterized the position of each individual (see Table 4-2 for Statements).

5.6. Discussion

As previously described in Section 2, the dominant public discourse around the development of a new wetland policy in Alberta calls for economics to be 'balanced' with wetland conservation. Embedded within the 'balance discourse' is a suggestion that a more conservation-oriented policy will unduly jeopardize the economy, a notion that has become naturalized and has largely gone unchallenged. However, when this dominant public discourse is compared against those discourses that emerged from our study, it is evident that the public discourse lacks consideration of other important issues, and that the public debate over how wetlands should be managed has been substantially narrowed to consider a single contentious and polarizing issue.

In contrast to the public discourse, this study uncovered a consensus factor that strongly endorses the idea that a robust wetland policy will not unduly impact the economy, and that wetlands are a public good that should not be jeopardized by private interests. The disagreement and tension over wetland management instead lies in the *process* for governing wetlands. This finding is consistent with what Buscher and Dressler (2007) have previously noted: that the dichotomy is not in the 'pro-people' or 'pro-nature' debate, but rather, the real debate lies in the politics of conservation and the *process* of governance. Arguably, the public wetland policy debate has been intentionally focused on areas of conflict between key actors, rather than on areas of agreement. In this way, the economy has been used as a wedge issue to polarize the wetland management debate, a tactic that has created adversarial 'interest-group politics' that has made it difficult to achieve broad and comprehensive policy solutions (Hisschemoller & Hoppe 1995; Nie 2003; Bryner 2008). Indeed, this tactic has successfully delayed the formulation of *any* policy solution since 2008, an outcome that clearly benefits industry actors with operations in northern Alberta where the existing policy does not apply. Similar to the issue of climate change, the question of how wetlands should be managed in Alberta overlaps significantly with questions related to energy policy because large expanses of wetlands in northern Alberta extensively overlap with current and proposed oil sands operations. As Bryner (2008 p. 328) has articulated, "cheap energy is a widely held political mantra that causes politicians and citizens alike to fear policies … that might threaten to raise energy prices", and this fear has given

industry coalitions in Alberta significant power to influence the wetland management discourse.

The question of how industry has gained this power to influence public discourse is revealed by carefully examining the history of how the wetland policy debate has unfolded in Alberta since 2008. In this examination, it would appear that industry's power has been largely generated through privileged access to government politicians and decision makers. In their work on the theory of access, Ribot and Peluso (2003) discuss various mechanisms that enable access to power, and among them, they describe *access to authority* as being a critical element of privileged access. Those individuals acting in positions of authority are considered to be "nodes of direct or indirect forms of access control" and "privileged access to the individuals or institutions with the authority to make and implement laws can strongly influence who benefits from the resource in question" (Ribot and Peluso 2003 p. 170).

The notion that industry has enjoyed privileged access to decision makers is supported by government documents obtained through a Freedom of Information Request submitted to government in December of 2011 for any communications, materials, or documents between the Ministry of Environment, Canadian Association of Petroleum Producers, and Alberta Chamber of Resources related to the creation of the draft wetland policy intent. These documents reveal frequent meetings between high-ranking government officials and executives in the energy industry, and allude to a concerted effort by government to ensure that industry concerns were being addressed as the wetland policy process unfolded. For example, on December 3, 2009, a briefing note summarized the outcomes of a cross-ministry meeting called for the purpose of gathering government department support for the release of a new wetland policy. One of the conclusions of the meeting was that "Ministers were supportive of the wetlands policy and bringing it forward to seek Cabinet approval for *focused Industry consultation*" (Government of Alberta 2009 p. 1 emphasis added). The fact that focused industry consultation was specified, as opposed to public consultation, is illuminating and suggests that the government was seeking industry support for the proposed policy prior to a public release.

What followed in October of 2010 were focused meetings between the Ministry of Environment and members of Canadian Association of Petroleum Producers and Alberta Chamber of Resources, which were held in the offices of industry. Minutes taken at these meetings reveal industry's opinions about the new proposed policy, and suggest that industry representatives were satisfied that many of their previously raised concerns had been adequately addressed by the draft policy. For example, in the meeting with representatives from CAPP, attendees asserted that the proposed policy "provides flexibility, regional response, and risk-based approach. *What O&G industry wanted originally*" (IMI Strategics 2010a p. 1 emphasis added). In their meeting with government officials, Alberta Chamber of Resources indicated that they were "pleased that the policy moves away from no net loss" (IMI Strategics 2010b p. 1) and further requested that "when developing [the] implementation strategy, [ACR] would like input into [the] terms of reference" (IMI Strategics 2010b p. 2). These documents clearly reveal that representatives from the energy industry have enjoyed access to important government decision makers throughout the wetland policy development process, and this influence appears to have helped shape the public discourse around wetland management in Alberta. It is important to note that this is not the only evidence of industry representatives enjoying access to government decision makers in relation to controversial environmental issues. Documents obtained in an unrelated Freedom of Information Request in 2011 revealed that Alberta government officials met privately with CAPP representatives to discuss a joint public relations campaign to counter public and scientific "misinformation" regarding groundwater contamination from industrial practices associated with shale-gas 'fracking' (Rusnell 2011).

When attention is turned to the shared perceptions of key actors with respect to how wetlands should be regulated in Alberta, results of this research suggest some degree of discourse conformity between industry representatives and key government decision makers. The underlying mechanism driving this conformity is unclear; however, one possible explanation lies in the concept of "thin domination" (Scott 1990). Often, subordinate actors, while not truly believing in the hegemonic public discourse, become resigned to a particular course of action or outcome, seeing it as 'inevitable' and 'unavoidable' in the face of existing power structures. This thin domination can lead to "ritualisms" of subordination (Scott

1990 p. 96), whereby subordinate actors conform by participating in the dominant discourse, as well as through adopting conduct that supports or reinforces that discourse. Hegemonic public discourses often serve as conscious and unconscious structures of knowledge that can influence how actors make decisions; once actors become embedded within a dominant structure of knowledge, their decisions and practices can be enabled or constrained by expectations around how they are 'allowed' or 'expected' to behave (Ferguson 1994; Rossi 2004). In turn, the daily practices that are adopted and the discretionary decisions that are made can produce symbolic, rather than effective policy action, thereby resulting in sub-optimal policy outcomes. These outcomes contribute to, and support, the underlying accounts that are embedded and taken for granted in government culture (Foucault 1977; Freudenburg 2005), and re-enforce the privileged access enjoyed by those actors who benefit the most from symbolic wetland policy decisions.

While it is difficult to definitively establish empirically whether thin domination is operating in this context, comments from the Q sort questionnaire suggest that this may be the case. For example, when asked to comment on whether the views of their institution were reflective of their own personal views on wetland management in Alberta, one government employee indicated that their personal views were only "somewhat" aligned with the views of their organization, stating "My views are more towards conservation of the resource, while the GOA [Government of Alberta] must be more balanced and recognize the need for tradeoffs". A second government employee echoed this sentiment by saying "I personally feel that wetland protection should be a stronger component of my organizations views on wetland management."

In contrast to a thick version of domination, where the subordinate internalize and consent to the views of the more powerful (i.e. the views and values of government and industry are aligned), the above quotes suggest a thinner version of domination that illustrates resignation in the midst of a naturalized social order and structure (Scott 1990). This naturalized social order, whereby industry interests are consistently given priority in government decision making, has been well documented by other scholars who study natural resource management in Alberta (Davidson & Mackendrick 2004; Harrison et al. 2005; Fluett & Krogman 2008; Davidson & Gismondi 2011).

While the results of this research suggest that some government employees are vulnerable to domination by industry perspectives, it is important to point out that there were others whose institutional perspective more closely aligned with the views expressed by the ENGO cluster. This result clearly highlights the diversity of perspectives on wetland management that exists within the Government of Alberta as a single institution. As one government respondent articulated, "It is extremely difficult to capture the 'organization's' views, when the views are hierarchical. I have spoken from a Branch perspective; there is also a Division perspective, and the political perspective. The three are frequently at odds". This statement highlights the difficulty that many government employees have in reconciling what the 'government's position' is when it comes to wetland management in the province. The confusion and conflict that exists over mandates and priorities for wetland management has been shown to influence decision-making practices of front-line government workers by creating uncertainty and room for negotiation, which ultimately has resulted in sub-optimal policy outcomes (Clare et al. 2011).

5.7. Conclusions

As the number of intractable environmental problems grows, so too does the rhetoric that asserts environmental protection must be 'balanced' with jobs and the economy. This 'balance discourse' has become a privileged account that seeks to frame controversial policy issues in simplistic terms, thereby marginalizing voices calling for limits to growth. The prevalence of this discourse begs for a deeper examination into what 'balance' really means, and in particular, requires that more scrutiny be given to *who* has been given the power to define what 'balance' is within the context in which it is being used.

Results from this study suggest that there is a strong consensus amongst key policy actors that a more robust wetland policy will not unduly impact the economy, a finding that conflicts with the prevailing public discourse. The disagreement between policy actors instead lies in the *process* for governing wetlands. On issues of governance, a discursive coalition between industry and key government decision makers was evident. This discourse represents a 'business as usual' view that favors minimal wetland regulation and an increased use of market-based instruments. This

perspective was in contrast to other voices that expressed concern over current rates of wetland loss, with calls for stronger wetland laws and policies.

These results suggest that the prevailing 'balance discourse' that has dominated the public sphere has reduced the wetland policy debate to a simple, dichotomous choice: wetlands or the economy. This overly simplified view has created immense conflict between industry and environmental groups, and has overshadowed more substantive and meaningful policy issues. The result has been a policy discourse that has been dominated by concerns over what industry stands to lose, rather than what the public stands to gain, from a new province-wide wetland policy. Overcoming this dominant public discourse to reframe the wetland management issue will be difficult in the face of existing power structures, but is nonetheless essential if improved wetland policy outcomes are desired. Improving wetland conservation outcomes can only be done by having a more earnest and honest discussion about what 'balance' truly means, and including a more diverse group of opinions and perspectives into wetland policy discussions.

5.8. Literature Cited

Alberta Hansard. 2010. 27th Legislature, 3rd Session, Monday, November 1, 2010, Afternoon. Legislative Assembly of Alberta, Edmonton, AB, Canada. Retrieved from http://www.assembly.ab.ca/ISYS/LADDAR_files/docs/hansards/han/legislature_27/session_3/20101101_1330_01_han.pdf.

Audette, T. 2010, April 21. Green groups attack province's 'weak' wetland policy. Edmonton Journal:A.3. Edmonton, AB, Can.

Bachrach, P., and M. Baratz. 1970. Power and poverty: Theory and practice. Oxford University Press, New York, NY, USA.

Barry, J., and J. Proops. 1999. Seeking sustainability discourses with Q methodology. Ecological Economics 28:337–345.

Bennett, D. 2008, September 15. Alberta eco-groups/oilpatch part ways on proposed wetland policy. Kelona Daily Courier. Retrieved from http://www.pentictonherald.ca/includes/datafiles/CP_print.php?id=134538&title=Alberta%20ecogroups/oilpatch%20part%20ways%20on%20proposed%20wetland%20policy.

Brown, S. 1970. On the use of variance designs in Q Methodology. The Psychological Record 20:179–189.

Brown, S. 1981. Intensive Analysis. Pages 627–649 in D. D. Nimmo and K. R. Sanders, editors. Handbook of Political Communication. Sage Publications, Inc.

Brown, S. R. 1980. Political subjectivity: Applications of Q methodology in Political Science. Yale University Press, New Haven, CT, USA.

Brown, S., and T. Ungs. 1970. Representations and the study of political behaviour: an application of Q techinque to reactions to the Kent State incident. Social Science Quarterly 51:514–526.

Brown, S., D. Durning, and S. Selden. 2007. Q Methodology. Pages 721–764 in K. Yang and G. J. Miller, editors. Handbook of Research Methods in Public Administration. Auerbach, Boca Raton, FL, USA.

Bryner, G. 2008. Failure and opportunity: environmental groups in US climate change policy. Environmental Politics 17:319–336.
Buscher, B., and W. Dressler. 2007. Linking neoprotectionism and environmental governance: On the rapidly increasing tensions between actors in the environment-development nexus. Conservation and Society 5:586.
Chamberlain, E. C., M. B. Rutherford, and M. L. Gibeau. 2012. Human perspectives and conservation of grizzly bears in Banff National Park, Canada. Conservation biology : the journal of the Society for Conservation Biology 26:420–431.
Clare, S., N. Krogman, L. Foote, and N. Lemphers. 2011. Where is the avoidance in the implementation of wetland law and policy? Wetlands Ecology and Management 19:165–182.
Cryderman, K. 2008, October 16. Oilsands firms balk at wetlands policy; "No net-loss" rule could cost oil producers billions. Calgary Herald:A.7. Calgary, AB, Can.
Cryderman, K. 2010, October 30. Alberta dilutes wetland defence; Lost habitat won't always be replaced. Calgary Herald:B.1. Calgary, AB, Can.
Davidson, D., and M. Gismondi. 2011. Challenging Legitimacy at the Precipice of Energy Calamity. Springer.
Davidson, D., and N. Mackendrick. 2004. All Dressed Up with Nowhere to Go: The Discourse of Ecological Modernization in Alberta, Canada. The Canadian Review of Sociology and Anthropology 41:47–66.
Durning, D. W., and S. R. Brown. 2007. Q methodology and decision making. in G. Morçöl, editor. Handbook of Decision Making. CRC Press, Taylor & Francis Group, Boca Raton, FL, USA.
Ferguson, J. 1994. The Anti-politics Machine: "Development," depoliticization, and bureaucratic power in Lesotho. University of Minnesota Press, Minneapolis, MN, USA.
Fluett, C., and N. Krogman. 2008. Barriers to changing Alberta's oil and gas tenure system: Lessons from an oil dependent state. Projections: MIT Journal of Planning 8:120–139.
Foucault, M. 1977. Power/Knowledge: Selected interviews and other writings, 1972-77. Pantheon, New York, NY, USA.
Freudenburg, W. 2005. Privileged access, privileged accounts: toward a socially structured theory of resources and discourses. Social Forces 84:89–114.
Goslee, S., and D. Urban. 2007. The ecodist package for dissimilarity-based analysis of ecological data. Journal of Statistical Software 22:1–19.
Government of Alberta. 2009. Briefing Note - Meeting. Government of Alberta, Edmonton, AB, Can.
Hajer, M., and W. Versteeg. 2005. A decade of discourse analysis of environmental politics: achievements, challenges, perspectives. Journal of Environmental Policy & Planning 7:175–184.
Harrison, T., W. Johnson, and H. Krahn. 2005. Language and power: "Special interests" in Alberta's political discourse. in T. Harrison, editor. The Return of the Trojan Horse: Alberta and the New World (Dis)Order. Black Rose Books, Montreal, QC, Can.
Heynen, N., J. McCarthy, and P. Robbins. 2007. Neoliberal environments: False promises and unnatural consequences. Routledge, New Yourk, NY, USA.
Hisschemoller, M., and R. Hoppe. 1995. Coping with intractable controversies: The case for problem structuring in policy design and analysis. Knowledge, technology and policy 8:40–60.
IMI Strategics. 2010a. Alberta's Wetland Policy: Advance stakeholder engagement. Meeting 3: Canadian Association of Petroleum Producers, October 20, 2010, CAPP Offices, Calgary.
IMI Strategics. 2010b. Alberta's Wetland Policy: Advanced stakeholder engagement. Meeting 2: Alberta Chamber of Resources, October 19, 2010, ARC Offices, Edmonton.
Kreider, V. 2009. Counseling Graduate Students' Preference for Qualities pertaining to Teaching Effectiveness. Kent State University College.
Lukes, S. 2005. Power: A Radical View Second Edition. Palgrave Macmillian, New York, NY, USA.

Nie, M. 2003. Drivers of natural resource-based political conflict. Policy Sciences 36:307–341.
Niemeyer, S., J. Petts, and K. Hobson. 2005. Rapid climate change and society: assessing responses and thresholds. Risk Analysis 25:1443–1456.
Poteete, A. R., and J. C. Ribot. 2011. Repertoires of Domination: Decentralization as Process in Botswana and Senegal. World Development 39:439–449.
QSR International Pty Ltd. 2008. NVivo qualitative data analysis software.
R Development Core Team. 2011. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria.
Ribot, J. C., and N. L. Peluso. 2003. A Theory of Access. Rural Sociology 68:153–181.
Robbins, P. 2006. The politics of barstool biology: Environmental knowledge and power in greater Northern Yellowstone. Geoforum 37:185–199.
Rossi, B. 2004. Revisiting Foucauldian Approaches: Power Dynamics in Development Projects. Journal of Development Studies 40:1–29.
Rusnell, C. 2011, November. Alberta worked with industry on fraking PR strategy. CBC News Online. Retrieved from http://www.cbc.ca/news/canada/edmonton/story/2011/11/28/edmonton-fracking-province-public-relations.html.
Rutherford, M., M. Gibeau, S. Clark, and E. Chamberlain. 2009. Interdisciplinary problem solving workshops for grizzly bear conservation in Banff National Park, Canada. Policy Sciences 42:163–187.
Schmolck, P., and J. Atkinson. 2002. PQMethod 2.11.
Scott, J. C. 1990. Domination and the arts of resistance. Yale University Press, New Haven and London.
Suncor Energy Inc. 2011. 2011 Annual Report. Retrieved from http://www.suncor.com/pdf/Suncor_annual_report_2011_en.pdf.
Syncrude Canada Ltd. 2009. Synergy: 2008/09 Sustainability Report. Retrieved from http://www.syncrude.ca/pdf/Syncrude-SD-report.pdf.

CHAPTER 6

Conclusions

6.1. Research Overview and Summary of Key Findings

This dissertation gives careful consideration to the process of policy decision making by describing and explaining the factors that have influenced wetland policy implementation and outcomes in central and southern Alberta since the inception of the interim wetland policy in 1993. Specifically, this study was initiated with the aim of achieving the following research objectives:

1. Identify and describe key historical events and factors (i.e., ecological, social, economic, and political) that have influenced contemporary wetland management and policy decisions in Alberta.

2. Quantify key policy outcomes, including wetland avoidance and compensation, and evaluate these outcomes relative to stated management objectives and guidelines.

3. Examine existing power-relations among key policy actors and identify mechanisms of power that have influenced the development of contemporary wetland policy discourse and government decision making.

In order to address these research objectives, I used a mixed method approach that included both qualitative and quantitative data analysis. The foundation of the research consisted of 34 in-depth, semi-structured interviews that were conducted with key informants. These key informants were selected because they have

extensive and privileged information about the wetland policy process in Alberta. Key informants were selected using purposive snowball sampling, and included participants from a broad range of sectors, including government, non-governmental organizations, and industry. Interview data were used in all of the chapters in this dissertation to help bring clarity and understanding to questions of how front-line bureaucrats make decisions, how power operates to influence those decisions, and what past events and practices constrain contemporary decision making. Quantitative data collected from *Water Act* approvals were used to examine policy outcomes related to wetland compensation. Finally, a Q methodological study was used to conduct a discourse analysis, with the objective of better understanding the various discourses that exist in the on-going wetland policy debate, and how power operates to promote particular discourses over others.

In Chapter 2, the historical events, processes, attitudes, and legal precedents that have shaped social perceptions and structural relations between the state, civil society, and the market were examined to help provide historical context for contemporary wetland loss and policy decisions in Alberta. This chapter revealed that social perceptions and institutional culture have been influenced by a resourcist paradigm that has dominated water policy and wetland management in Alberta since the late 1800s. As a result, contemporary wetland management has been constrained not only by social perceptions and attitudes about wetlands, but by a legacy of federal and provincial laws and policies that have consistently prioritized industrial development ahead of environmental protection. This positioning of industrial interests over the public interest has significantly shaped existing power relations in the province, a dynamic that can be seen in the ongoing wetland policy process.

Following the historical analysis of wetland management in Alberta, Chapter 3 took a broader view of the contemporary approach to wetland management in North America. Specifically, this chapter examined the 'mitigation sequence' that is commonly used as a framework to direct wetland management decisions, with the objective of better understanding why the first step of the mitigation sequence – wetland avoidance – is commonly overlooked in the implementation of wetland law and policy. Five key factors emerged from the literature, and were supported by interview data, as being central to the failure of

decision makers to prioritize wetland avoidance above compensation in the mitigation sequence, including: 1) A general lack of agreement on what constitutes "avoidance"; 2) Failures in the land use planning process to identify and prioritize wetlands in advance of development; 3) The economic undervaluation of wetland habitats; 4) A "techno-arrogance" associated with wetland creation and restoration that assumes lost functions can be easily replaced through engineered solutions, and; 5) Inadequate enforcement and compliance of wetland law and policy. Key considerations that were put forward to re-institute avoidance as a tenable policy solution include science-based watershed planning, more comprehensive ecological and social valuation of wetlands, and long-term citizen monitoring of wetlands.

One of the key findings of Chapter 3 was that wetlands are rarely avoided in the implementation of wetland policy and that wetland compensation appears to be a routine decision-making practice in Alberta. Given the apparent preference for the use of wetland compensation over avoidance, the objective of Chapter 4 was to empirically quantify compensation outcomes in Alberta between 1999 and 2010, by using data obtained from *Water Act* approvals. These outcomes were then compared to key statements made in the provincial compensation guidelines to determine the extent to which actual compensation outcomes conformed to expected outcomes. This study revealed large discrepancies between what the compensation guidelines say and the actual compensation outcomes that were measured, providing strong evidence for bureaucratic slippage and underlying agency capture in the implementation of wetland compensation guidelines in Alberta. Further, there was strong qualitative evidence to suggest that agency capture is being driven by overhead governance and political control of the bureaucracy, as well as organizational goal ambiguity that fosters fragmentation of decision-making authority. These results illustrate that despite having very clear and explicit rules to help direct decision making, outcomes can be influenced by a myriad of situational factors. Thus, a closer examination of agency context allows for a better understanding of the constraints, opportunities, and routinized patterns of communication and decision making that influence policy effectiveness.

The final data chapter in this dissertation examined the public discourse that has dominated the wetland policy debate in Alberta over the last several years, which has called for economic development to be 'balanced' with wetland

conservation. Yet within this 'balance discourse', there is little understanding of how, by whom, and for whom economic prosperity and wetland conservation should be balanced, and how power operates to produce dominant public discourses that influence government decision making. Using Q methodology, this chapter examined whether key decision makers subscribe to the dominant public discourse of 'balance', and where key decision makers were positioned within the discourse relative to one another. In contrast to the dominant public discourse, the results of the analysis suggest that there is a strong consensus amongst key policy actors that a more robust wetland policy will not unduly impact the economy. The disagreement between policy actors instead lies in the *process* for governing wetlands. On issues of governance, a discursive coalition between industry and key government decision makers was evident, and represented a 'business as usual' approach to wetland management that favors minimal regulation and an increased use of market-based instruments. This perspective was in contrast to other voices that expressed concern over current rates of wetland loss, with calls for stronger wetland laws and policies. The results of this study suggest that the 'balance discourse' has become a privileged account that has obscured larger questions of what is being balanced and by whom. It also sheds light on how powerful actors can control and influence public discourse, which can act as structures of knowledge to influence daily decision making by street-level bureaucrats.

6.2. Knowledge Contributions

The regulation and management of water resources is one area of environmental decision making that is at the nexus of ecology, power, and politics. As a consequence, the ways in which water has been managed over time and across space has fundamentally shaped societies, social relations, and the environment (Ekers & Loftus 2008). While various actors within a liberal democracy hold power in the management of water resources, it is within the state itself where much of this power is consolidated, and where numerous actors converge to influence both the decision-making environment and daily decision-making practices.

Within the state, much of the power to make water management decisions is held by front-line bureaucrats who interpret and negotiate agency mandates and policies, often trading off one interest for another in such negotiations (Lipsky 1980;

Coslovsky et al. 2011). While bureaucratic discretion is a cornerstone of agency power and is often considered an important component of responsive and creative policy, this discretion can be subject to coercion, both from within and outside of government. While this coercion can be blatant, it is more often hidden or unconscious and operates as a structure of knowledge that shapes individual beliefs and actions, limits participation within the policy arena, or constrains the way in which problems and solutions are formulated (Hisschemoller & Hoppe 1995; Freudenburg 2005; Hajer & Versteeg 2005; Ekers & Loftus 2008).

Understanding how existing power relations influence agency decision making is paramount to formulating more responsive and reflexive environmental policy. While policy evaluation has become an expected and regular part of the policy process, this evaluation rarely delves deeply into the 'details' of policy implementation to examine how agency culture, social norms, and daily decision practices influence policy outcomes.

This dissertation answers the call to more carefully attend to the details of policy implementation, and in so doing, provides a strong example of how a transdisciplinary and mixed-method approach can be used to uncover policy barriers. The application of such a methodological and theoretical triangulation approach is somewhat rare in the academic literature, yet this type of research is critical for addressing complex and 'wicked' policy problems (Nie 2003). As such, this dissertation provides an example of how qualitative data can be combined with quantitative data to help reveal policy outcomes, as well as the underlying mechanisms that produce such outcomes. This research also integrates theory and concepts from across the natural and social sciences to help explain and understand phenomenon of interest. For example, Chapter 4 uses quantitative data to clearly measure wetland compensation outcomes, and subsequently relies on qualitative data and theory from multiple disciplines to help explain the factors that have produced those outcomes. Theory from both environmental sociology and public administration was combined to bring a new understanding to the mechanisms that produce agency capture. Chapter 5 also combines qualitative and quantitative data to extend power theory on both access and privileged accounts by establishing a clear link between privileged access and the production of privileged accounts, and further demonstrates how privileged accounts or dominant discourses act as

structures of knowledge. Specifically, this research makes empirical linkages between dominant discourse and thin domination, whereby decision makers conform by participating in the dominant discourse or adopting conduct that supports or reinforces that discourse.

6.3. Policy Contributions and Considerations

Despite a stated commitment by the government of Alberta to review wetland policy outcomes every five years (Alberta Water Resources Commission 1993), to-date, such a review has never been undertaken. As a result, this research represents the most comprehensive evaluation of wetland policy outcomes since the provincial government adopted the interim wetland policy in 1993. Given that the province is currently engaged in the development of a new provincial policy, this research is timely and offers practical considerations for developing a more effective wetland policy and implementation plan.

One of the major findings of this research revealed that wetland policy decisions made by front-line bureaucrats are often tempered by the influence of politics, which is exercised through overhead control of the bureaucracy. This control is manifest in agency decision making through vague department mandates and ambiguous or contradictory policy goals. While these issues are difficult to resolve, one pathway forward is to develop a policy implementation plan that provides specific and unambiguous direction for decision makers; however, as the results of Chapter 4 (bureaucratic slippage in the implementation of compensation guidelines) suggest, this step alone is insufficient to improve wetland policy outcomes. Rather, clarity in policy and agency mandates must also be accompanied by improved transparency within the decision-making process itself.

Transparency in wetland policy decisions is exceptionally difficult to achieve without the existence of, and access to, information that can be used to evaluate such decisions. An important discovery of this work is that the government does not have an electronic information system for storing comprehensive information related to wetland permits that have been issued in the province. The data that were used in this dissertation were exceptionally challenging to obtain, as much of the detailed information documenting wetland impacts and approval conditions exists only in hard copy files. Thus, in order to acquire wetland permit data, one must first

obtain permission from the government to access files that contain *Water Act* information, which are located in different regional offices across the province. Each file must then be inspected to extract the desired information out of hundreds or thousands of pages of information. Such a system of information tracking makes it very difficult for government personnel or the public to access the data required to evaluate wetland policy outcomes. Under such conditions of low visibility and insufficient information, there is very little opportunity for regulators to learn from the outcomes of previous decisions, nor is there opportunity for the public to scrutinize such decisions.

Related to the issue of information tracking, this work also revealed inconsistencies between wetland compensation records kept by the government and similar records kept by Ducks Unlimited Canada (DUC). For example, there were instances where government records indicated that a compensation payment should have been made to Ducks Unlimited, without any corresponding record of the payment having been received by DUC. Further, discrepancies in approval numbers and dates between government records and Ducks Unlimited records were common, making it difficult to definitively track the fate of compensation payments made to DUC. Introducing more stringent annual reporting requirements for Ducks Unlimited would improve the transparency of compensation outcomes. Further, having the government capacity and the necessary data to review and verify the contents of such a report would significantly contribute towards improved transparency of wetland decision making in the province.

6.4. Limitations and Future Research

The Government of Alberta is an institution that is composed of thousands of employees who work across hundreds of departments, each with their own unique and dynamic organizational culture. While I have made assertions about "agency culture" within the specific context of wetland decision making, I recognize that these statements have been made without having sampled across all departments within government, and that experiences of front-line decision makers who were not included in this study may differ from those described herein. A more comprehensive survey of government decision makers across a wider range of environmental policy issues would render these results more "generalizable";

however, I am confident that this study captures the essence of the struggles faced by those front line bureaucrats who are tasked with making decisions that 'balance' economic development and the environment, regardless of which government department they reside within.

Not surprisingly, one of the most interesting findings from the interviews conducted as part of this research revealed that wetland management is inherently tied to larger questions of water management, and specifically, water quality and quantity. Thus, the perceived importance of wetlands as a management issue differed considerably between government offices in southern Alberta, where water scarcity is an environmental and political reality, and government offices in central Alberta. While this study was not originally conceived to be a comparative study examining differences in wetland policy outcomes between environmentally and geographically distinct regions of the province, this comparison would provide fertile space for future research to examine how ecological, social, and economic realities drive local politics, management, and decision making within a larger agency context.

The problem of insufficient information tracking was one issue that seriously constrained both the scope and strength of this work because a lack of reliable *Water Act* data made it difficult to quantify wetland policy outcomes. For example, the question of whether wetland area has been maintained in the settled area of the province since the inception of the wetland policy in 1993 is central to the question of whether policy goals have been achieved. Further, questions of whether the use of compensation has resulted in trade equivalency when considering a suite of ecological metrics is an important question, given the heavy reliance on compensation as a policy tool for wetland management in Alberta. While both of these questions were originally included in the scope of this research, a lack of spatial data with which to address these questions proved to be a significant barrier, as the time required and complexities associated with creating a wetland inventory for different time periods prevented this work from being included in this dissertation. However, these questions are currently under consideration, the results of which are forthcoming as a part of future work examining wetland policy implementation in Alberta.

6.5. Concluding Thoughts

Effective environmental policy requires periodic and objective evaluation to determine whether policy goals are being met, and to refine or modify policy goals or decision making to improve outcomes. While much of the policy evaluation is focused on *what* outcomes are being achieved and whether those outcomes are consistent with the goals of policy, far less attention is given to the important question of *why* a particular outcome has been achieved over others. This research provides compelling evidence for the need to give greater attention to the decision-making environment, and to consider how power can operate to create particular structures of knowledge that constrain decision making. Without giving greater attention to the factors that influence how, why, and in whose interest policy decisions are being made, little progress will be made in producing effective, rather than symbolic, policy action.

6.6. Literature Cited

Alberta Water Resources Commission. 1993. Wetland management in the settled area of Alberta: an interim policy. Pages 1–18. Alberta Water Resources Commission, Edmonton, AB, Can.

Coslovsky, S., R. Pires, and S. S. Silbey. 2011. The pragmatic politics of regulatory enforcement. in D. Levi-Faur, editor. Handbook on the Politics of Regulation. Edward Elgar Publishing Limited, Northampton, MA, USA.

Ekers, M., and A. Loftus. 2008. The power of water: developing dialogues between Foucault and Gramsci. Environment and Planning D: Society and Space 26:698–718.

Freudenburg, W. 2005. Privileged access, privileged accounts: toward a socially structured theory of resources and discourses. Social Forces 84:89–114.

Hajer, M., and W. Versteeg. 2005. A decade of discourse analysis of environmental politics: achievements, challenges, perspectives. Journal of Environmental Policy & Planning 7:175–184.

Hisschemoller, M., and R. Hoppe. 1995. Coping with intractable controversies: The case for problem structuring in policy design and analysis. Knowledge, technology and policy 8:40–60.

Lipsky, M. 1980. Street-level bureaucracy. Russell Sage Foundation, New York, NY, USA.

Nie, M. 2003. Drivers of natural resource-based conflict. Policy Sciences 36(3):307-341.

APPENDIX A

Information Sheet, Interview Guide & Consent Form

Wetland loss in Alberta: identifying successes, barriers, and unintended outcomes of public policy

Information Sheet

Dear [Participant Name]:

As part of a multi-disciplined research project studying wetland health and policy implementation in Alberta, this study aims to identify the successes, barriers, and unintended outcomes of wetland policy implementation in the province. As part of this study, we will be interviewing key personnel with a working knowledge and understanding of the wetland policy from industry, provincial and municipal governments, delegated government authorities, and environmental and engineering consulting firms to gain an understanding of how each stakeholder group interacts with, and is affected by, wetland policy implementation. We hope that this research will help to identify key areas of success, in addition to providing information that can be used to make recommendations on how wetland policy implementation can be more effective.

As someone who works with wetland policy in the province of Alberta, we would like very much to include you in our study. This would require an hour or two of your time for an interview on this topic. With your consent, we would like to record our interview as well as take notes. The interview will be transcribed either by the researchers or by a transcriber, and only the researchers directly involved in the study will have access to the recorded interviews. All copies of the recorded interviews associated with this study will be stored in a locked cabinet, and only the prime researchers will have access to these recordings. The information from the interviews will be used as part of a PhD thesis at the University of Alberta, as well as other publications or presentations that may result from the research. The data collected during this study may also be used as part of a longer-term study on wetland policy implementation in Alberta and across other jurisdictions in Canada.

Upon completion of the interview, all participants in the study will be referred to by a code rather than by name to ensure anonymity and confidentiality. Your name will not appear in any publications and you will only be referred to by your organizational affiliation (e.g. government, industry, consultant, or non-governmental organization). Given that the network of individuals in natural resource management in the province is closely knit, we cannot guarantee that the text of your response will not reveal your identity. However, in an effort to protect your anonymity, we will not use direct quotes in any publication or presentation that would appear to be revealing of the respondent's identity. In addition, you may decline to answer any of our questions and are free to stop the interview at any time. You may also withdraw from the study at any time during the interview, and up to two weeks after the interview has been completed by contacting one of the primary researchers. Upon receiving your written or verbal request to withdraw, all information associated with your interview will be removed from the study. If you would like to receive an executive summary of our research findings, we would be happy to provide one upon receiving your request.

Benefits of the Research:
Wetlands have become recognized as one of the most important habitats on earth, primarily because they support a level of biodiversity that is disproportionate to their size. In addition to their ecological value, wetlands also offer substantial social and economic benefits in the form of ecological goods and services, such as flood protection, recreational opportunities, and aesthetic value, among others. Despite these social, economic, and ecological values, wetland loss in Alberta during the last century has been significant. Consequently, any ability to enlighten policy changes that result in greater protection for wetland habitats on a systematic basis will positively contribute to the maintenance of biodiversity on the province, as well as ensuring that the ecological goods and services provided by wetland habitats can be enjoyed by future generations of Albertans.

If you have any questions regarding the interview or this study, please contact any of the primary researchers listed below:

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Should you have any concerns about this study, you may contact Dr. Wendy Rodgers, Chair of the PER-ALES Research Ethics Board, at 780-492-8126. Dr. Rodgers has no direct involvement with this project.

We sincerely thank you for considering to be a participant in this study, and we look forward to your response.

Wetland loss in Alberta: identifying successes, barriers, and unintended outcomes of public policy.

- Interview Guide -

Interview Questions:
Key informants will include participants from provincial and municipal governments, delegated government authorities, environmental and engineering consultants, land developers, and industry (oil and gas, agriculture) who have a working knowledge of wetland policy implementation in Alberta.

Key interviewers:
Shari Clare, PhD student (Department of Renewable Resources)

Selection Criteria for Key Informants

- Has direct experience with the 1993 Alberta wetland policy in some capacity as a regulator, consultant, applicant for an approval, or writer of approvals
- Able to hold the interview in person, either at a work office or at the University.
- Must be at least 18 years old.

Experience with Wetland Policy

1. Can you tell me what your job title is, and explain how you interact with the wetland policy in your line of work?

2. How long have you been doing this type of work?

Approval Process

3. Are you, or have you ever been, involved in the Water Act approval process in your capacity as a government employee? (Probe to ask about those water act approvals to impact a wetland).
    - If NO, go to question 8
    - If yes, probe
        - Can you generally describe your experiences working with Water Act Approvals? What are the negatives and positives?
        - Over the last year approximately how many projects have you been involved in that required a permit under the Water Act?
4. When a proponent makes an application to impact a wetland, in your experience, which policy tool is most preferred by the applicant? – avoidance, mitigation, or compensation?
    - Probe:
        - Why is the preferred option? Is it cheaper, faster, easier? Ask them to give an example of a potential typical case they are familiar with.

    - To the best of your knowledge, has Alberta Environment ever required an applicant to reconsider an application because the proposal did not adequately consider avoidance of the wetland?
    - From your experience, in your region, does the government prefer a particular policy tool over others (avoidance, mitigation, compensation)? Why?

5. If a project impacts a wetland in your region, what is the most common type of compensation that is proposed? E.g. on/off-site constructed wetlands, NSWMF, in lieu-fee payments, wetland banking.
    - Probe:
        - Has this changed from five years ago? If yes, why?
        - To the best of your knowledge, has Alberta Environment ever required a proponent to modify their compensation plan in your region?
        - Have you observed a difference across regions in how policy tools are used? (Note: Explore variation of experiences with requirements for compensation if interviewee has experience across jurisdictions.)
6. Have you ever received an application for a project where a wetland has been impacted prior to receiving an approval?
    - Probe:
        - What are the general reasons wetlands are impacted before approvals are granted?
        - In these cases, are permits eventually granted to proponents?
        - Did these cases ever result in enforcement action? (For Alberta Environment employees only: What kind of enforcement action? What is typically the relationship with Alberta Environment (AE) during this enforcement?) (note we are seeking to find out how AE works with the proponent to address the violation.)
7. How long does it normally take to obtain a water act approval for a project that impacts a wetland?
    - Probe:
        - From your perspective, what are the challenges involved in the application procedure?
        - In your opinion, are there ways in which the process could be improved? (Probe: questions around the kind of government resources, human and financial, available/lacking to implement wetland policy in Alberta.)

Alignment of Policy and Legislation

8. In your opinion, do Alberta Environment (AE) and Sustainable Resource Development (SRD) have similar goals for wetland conservation in the province?
    - Probe:
        - Which department has jurisdiction over wetlands? Is this a shared responsibility? If so, how do the departments share this responsibility?
        - Are there any operational or institutional barriers present that make it difficult for departments to share this responsibility?
        - If yes, do these barriers influence policy outcomes?
9. Based on your knowledge of the key priorities for AE and SRD, where do wetlands figure among other priorities such as land use planning, surface water quality management, habitat management, and so on?
    - Probe:
        - Do you think that this prioritization would change in the face of some other environmental issue, such as contaminated drinking water, or severe drought?
        - In your opinion, should wetlands have a higher or lower priority in government planning and management? Why?
10. In your opinion, are there other municipal, provincial, or federal policies or legislation that contribute towards meeting wetland policy goals in Alberta?
    - Probe:
        - If yes, get them to elaborate on these, and explain these policies or legislations that contribute to wetland conservation.
        - Are there municipal, provincial, or federal policies or legislation that act as barriers or disincentives in meeting wetland policy goals? Get them to elaborate and give examples.

Wetland Goals/Success

11. The current wetland policy goal is to maintain wetland area in the settled areas of Alberta. In your opinion, what are the key challenges in meeting this goal?
    - Probe:
        - How well do you think the current policy process is leading to the intended outcome of wetland area maintenance?
        - Is the maintenance of wetland area an appropriate goal? Are there other measures of success that we should consider aside from wetland area?

12. In your opinion, does the current wetland policy effectively contribute to wetland conservation in Alberta?
    - Probe:
        - Can you make any suggestions for how wetland policy implementation could be improved in the province?
        - Under the current policy process, have you observed any negative outcomes for wetlands that weren't intended as part of the policy?

13. Relative to other land use and environmental policies, do you think a new wetland policy should be a high priority for the government of Alberta. Why or why not?
    - Probe:
        - Are there other policies or planning processes that you feel could more effectively address wetland conservation in Alberta? For example, the Land Use Framework or the Cumulative Effects Management Framework?

Consent Form

Title of the Research Project:

Wetland loss in Alberta: identifying successes, barriers, and unintended outcomes of public policy

Consent:

- I acknowledge that I have been asked to participate in a research study and have received and read the attached information letter.
- I am aware of the risks associated with participating in this study and know that I can refuse to answer specific questions or may stop the interview at any time.
- I have been given an opportunity to ask questions and know that I may contact any of the primary researchers listed on the back of this page with any further questions.
- I am aware that the interview will be recorded and that only the primary researchers and transcriber will have access to the tape and transcriptions.
- I understand that information from this interview will be used in publications and presentations.
- I am aware that in these publications and presentations I will be referred to by my organizational affiliation (e.g. government, industry, or non-governmental organizations).
- I am aware that the data collected in this study may be used as part of a longer-term study that would examine wetland policy implementation issues in Alberta or with other jurisdictions in Canada.

_____	_____
Name of Participant (Please print)	Signature of Participant
_____	_____
Name of Witness (Please print)	Signature of Witness
_____	_____
Date	Signature of Investigator

Primary Researchers (people who may be contacted about the research):

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Should you have any concerns about this study, you may contact Dr. Wendy Rodgers, Chair of the PER-ALES Research Ethics Board, at 780-492-8126. Dr. Rodgers has no direct involvement with this project.

APPENDIX B

Q Methodology: Survey Instructions & Questionnaire

SURVEY INSTRUCTIONS

These instructions will guide you through the survey step by step. Please read the instructions carefully. If you have any questions, please feel free to ask any of the researchers who are overseeing the survey for clarification.

1. Take a deck of cards and the sorting sheet and sit at a table. Lay the sorting sheet down on the table in front of you.

2. This survey is about wetland policy in Alberta, and we are interested in gaining a better understanding of the various opinions that exist around **how wetlands should be managed in the province, relative to other considerations, and what role the government should have in the management of these habitats**.

   You have been given a deck of 36 cards, and each card contains a statement about wetlands and wetland management in Alberta. We would like you to rank-order these statements <u>from the point of view of your organization</u>.

   The question guiding this exercise is:

   How well do these statements reflect the views of your organization with respect to wetlands and wetland management in Alberta?

   The numbers on the cards (from 1 to 36) have been assigned to the cards randomly and are only relevant for the administration of your response.

3. Read all of the 36 statements carefully and divide them into three piles, as follows:

   - A pile for statements that are MOST representative of your organization's views on wetlands and wetland management;
   - A second pile for statements that are LEAST representative of your organization's views on wetlands and wetland management;
   - A third pile for cards that you feel are either not relevant or are not applicable.

   Place these piles in the three corresponding boxes "Most Representative", "Neutral or Not Relevant", and "Least Representative" on the bottom left side of the sheet on the table in front of you. Please note that there are no "right" or "wrong" answers to how you divide these statements.

4. Once you have placed the cards in the three boxes, count the number of cards in each pile and **write this number down in the corresponding boxes on the score sheet**. Please check to make sure that the numbers you entered in the three boxes add up to 36.

5. Take the cards from the "MOST REPRESENTATIVE" pile and read them again. Select the two statements you feel are the most representative of how your

organization views wetlands and wetland management in Alberta, and place them in the box on the right side of the sheet in front of you, below the number "4" (NOTE: it does no matter which one goes on the top or bottom). From the remaining cards in the deck, select the four statements you most agree with, and place them in the boxes below the "3". Follow this procedure until you have run out of cards from the "Most Representative" pile.

6. Now take the cards from the "LEAST REPRESENTATIVE" pile and read them again. Just like before, select the two statements that you feel are least representative of your organization's position on wetlands and wetland management in Alberta, and place these statements in the two boxes on the left side of the score sheet, below the "-4". Follow this procedure for all cards from the "Least Representative" pile.

7. Finally, take the remaining cards from the "Neutral or Not Relevant" pile and read them again. Arrange the cards in the remaining open boxes on the sheet in front of you.

8. When you have placed all the cards on the table in front of you, please review the placement of the cards and re-arrange any that you feel should be moved between the columns.

9. Once you are happy with the distribution of the statements, please write down each of the card numbers in the corresponding box on the score sheet provided.

10. Please indicate which two cards you placed below the "4" (most representative of your organization's view), and explain why you selected these statements over all others in the deck.

Card Numbers: _____ and _____

_____

_____

_____

_____

11. Please indicate which two cards you placed below the "-4", and explain why you selected these statements.

Card Numbers: _____ and _____

_____

_____

_____

12. Do you feel that your organization's perspective on wetlands and wetland management in Alberta has been adequately captured by this exercise (circle)?

Yes No Some what

Please explain:

13. Are the views of your institution reflective of your own personal views on wetlands and wetland management in Alberta (circle)?

Yes No Some what

Please explain:

14. Do you have any other thoughts or perspective you would like to share?

Score Sheet – Please record the number of each card in the corresponding box below