Species at Risk Policy: A Saskatchewan Case Study

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Abstract
How does society manage a public resource on private property? Canada's Species at Risk Act (2002) is a federal law that applies mandatory protection of species and critical habitat to federal lands only. This means the regulation of private property, where numerous endangered species are found, is left to the provinces. Unfortunately, only 6 of the 10 provinces have stand-alone species at risk legislation. British Columbia, Alberta, Saskatchewan and Prince Edward Island have no mandatory protection of endangered species within provincial boundaries. This paper examines Saskatchewan as a case study. The results of 369 surveys with registered voters in the provinces 4 largest urban centers are presented. Saskatchewan needs to create stand-alone species at risk legislation that makes sense for urban landowners as well as agricultural landowners and businesses. This will be no easy feat, but residents may be more open to regulatory legislation that expected.

In late December 2002, Canada passed the federal Species at Risk Act (SARA). This came almost ten years after Canada ratified the United Nations Convention on Biological Diversity (UNCBD), under which it committed to create new domestic legislation. SARA is aimed at the protection and recovery of species at risk across all of Canada, but the law only extends mandatory protection to species and critical habitat found on federal lands such as parks, reserves and post offices. The legal teeth of SARA can bite into other land parcels, like provincial Crown lands or private property via a "safety net" clause that states SARA "can only apply on provincial or private lands if provincial legislation or other measures are not already in place to protect the species, and if cooperative stewardship measures fail" (S.C. 2002, c. 29). However, this clause has never been used and, thus, the protection of endangered species on private lands, where numerous species live, is left to the provinces and territories to regulate.

In 1996, under the *Accord for the Protect of Species at Risk*, the federal, provincial, and territorial governments agreed to a common and collaborative approach to protecting at risk species in Canada. In part, the goal is to have each province and territory create stand-alone legislation complementary to federal legislation and complementary to each other. However, in 2012 only six provinces and one territory have created stand-alone legislation and only Ontario, Quebec and the Northwest Territories have updated their legislation post-SARA. The four laggard provinces are British Columbia, Alberta, Saskatchewan and Prince Edward Island, while Yukon and Nunavut join their ranks as the two territories without stand-alone legislation. It is true that all provincial and territorial governments have some form of protection for species at risk, often times inside wildlife, forestry or parks acts, but this is not in line with the conditions of the Accord or with the responsibility to safeguard biodiversity, as agreed to in the UNCBD.

When laggard provinces create stand-alone legislation, what kind of legislation should they create? Models range from American style command-and-control endangered species legislation that Ontario adopted in 2007 (S.O. 2007, c. 6) to more relaxed and stewardship/public lands focused policy in Manitoba (S.M. 1993 c.3 s.2). Each province in Canada has a unique landscape, both ecologically and politically, so it is not surprising that different provinces adopt different legislation. However, biodiversity is important to all provinces and to the nation of Canada so it is necessary for all governments to work together and implement policies aimed at the protection and recovery of species at risk. All across Canada, as in other places, biodiversity provides valuable ecological services like storage and cycling of nutrients, protection of water quality, breakdown of pollutants, food production, wood and fiber production, genetic resources and a plethora of social benefits like recreation and culture (Nature Saskatchewan 2006). While certain "biodiversity hotspots" exist in Canada, like the forests in southern British Columbia or the Leitrim wetlands in Ontario, biodiversity is important in all provinces and territories.

Using Saskatchewan as a case study, this paper examines the attitudes of registered voters toward species at risk, private property and government regulation. In order to create new legislation, as Saskatchewan intends to do, it is important to have a cross section of attitudes that include urban, rural, and agricultural voters as well as Aboriginal peoples since all residents in Saskatchewan will be affected by the loss of biodiversity. Thus, the 369 surveys responses in this study represent a first step toward uncovering urban and rural attitudes. Responses indicate that individuals are largely in favor of protection of other species and the creation of conservation laws, but are less supportive of private land regulations. Demographic variables generally do not provide statistically significant explanation for attitudes, save for political ideology and rural geography in relation to property regulation. After a brief review of the literature and explanation of the methodology used in the study, the results are presented followed by a discussion of the

implications for Saskatchewan environmental policy.

Literature Review

Personal environmental values are the subject of much debate in the social sciences. The Theory of Reasoned Action (Ajzen and Fishbein 1980) posits that core values give rise to basic beliefs and these provide the foundation for higher order beliefs, which then become the basis of behavioral intentions and, under the right conditions, result in specific actual behavior (see also Jonker at al. 2006). Thus, what environmental values an individual holds will potentially affect that individual's behavior. The most popular and widely cited forms of environmental value testing include Kellert's 1974 typology (revised 1976 and 1980), Dunlap and Van Liere's 1978 National Environmental Paradigm scale, and the World Environmental Attitudes Survey. Each of these surveys measures individual values, either regarding the environment specifically or moral/ethical values more generally. Today there are a plethora of other scales, measures and studies examining "values" in the socio-political and environmental realm. But despite the almost 45 years of study, there is still uncertainty about the link between certain attitudes and demographic variables like gender or political ideology.

At some level there is the expectation that everyone should care about the environment because the environment affects everyone. However, not everyone is affected the same way and, therefore, not everyone agrees about environmental problems, especially not their causes or the possible policy solutions (Dunalp, Xiao and McCright 2001). Part of the conflict stems over the fact that in empirical studies there is little agreement on what constitutes the "environment" or "pro-environmental" attitudes. Sometimes the environment is equated very generally with "nature" and other times with very specific issues like recycling paper (see for example, Barr, Ford and Gilg 2003). Most studies are somewhere in between focusing on issues like climate change, nuclear waste, animal rights, air pollution and similar nebulous topics. This is why it is difficult to pinpoint a relationship between demographics, or other explanatory variables, and "environmental values." Nevertheless, when policymakers embark upon the creation of new regulations, it is important to understand not only what the public thinks, but also why the public might feel a certain way. Such information can be used to cater policy to certain target groups and to develop strategies to be used under certain conditions.

Presently, very little research exists around public attitudes toward species at risk legislation in Canada. According to Pollara Pollsters, a Canadian polling company, in 2000 public support was very high for endangered species protection whereby 66% of those polled strongly supported endangered species legislation, 28% supported it somewhat and only 6% did not support such legislation (Pollara 2000). However, the poll was very broad and does not help policymakers understand why people support policy or what kinds of policy tools are most popular. In terms of attitudes toward species at risk legislation two areas are of crucial importance: attitudes toward other species and attitudes toward land-use regulation. Most land in Canada and the United States is privately owned; so this means most endangered species now rely upon private lands for survival. In the US the Endangered Species Act directly regulates private property. In Canada, the provinces traditionally have jurisdiction over their own natural resources and land-use regulation. Thus, provincial legislation, not SARA, has to grapple with regulating private land for the purposes of conservation. This makes it necessary to uncover what people in the different provinces think about conservation and regulation before new legislation is created.

Moreover, it would be useful to know what different segments of the population are willing to support so as to decrease the likelihood of a disjoint between new legislation and public support. There seems to be wide consensus in the literature that gender affects the way individuals think about, value, and sometimes behave towards, wildlife and conservation. It has been consistently found that women demonstrate more concern for the moral treatment of animals and they display more moralistic and humanistic attitudes toward animals generally (Kellert and Berry 1987; Kellert 1996). For example, the 1993 General Social Survey asks on a 5-point scale if animals should have the same moral rights that human beings do. The average mean for women is 2.91 compared to men at 2.47, which is a statistically significant difference at the .05 p level (Peek et al 1996). Also, wildlife management studies show that women are more likely to express anti-hunting attitudes (Anthony et al 2004; Doughtery et al 2003), and along the same lines, studies indicate that women are more likely to be animal rights advocates (Peek et al 1996; Sperling 1988). This suggests that women might favor species at risk legislation, or in the very least support the conservation of other species. It also implies that outreach may need to target men in order garner their support for new wildlife management policies.

With regard to private property, very few studies exist that illustrate a relationship between demographics and attitudes. At the surface level, Dunlap, Xiao and McCright (2001) make a link between liberal ideology and support for environmental regulation, which might imply that conservatives, such as Saskatchewan Party members, would be less willing to regulate private property than liberals or social Democrats in the province. More nuanced and detailed work in the field examines predominately agricultural producers attitudes toward private property and wildlife management (see for example Jackson-Smith et al. 2005; Daley et al. 2004; Erickson and DeYong 1992; Readings and Clark 1993, Brook, Zint and De Young 2003; Stern 2006; Vogel 1996). By-and-large these studies suggest, in line with Kellert's extensive work in the field, that landowners have a utilitarian and somewhat negative attitude toward the environment. It is almost assumed in the literature that farmers, particularly Western farmers and ranchers, are known for "their individualism, self-reliance, and strong anti-government sentiment" (Inman and Mcleod 2002, 92). Thus, we might also expect rural people to feel differently than urban people about private property issues and, therefore, wildlife issues. Extractive theory suggests that utilitarian values are held more strongly by rural residents because they are more dependent on natural resource extraction (Dunlap, Xiao and McCright 2001). This could be because rural people either are farmers/ranchers themselves or because their community depends on, and centers around, the agricultural lifestyle.

However, while this work gives reasons to suspect that conservatives and rural agricultural landowners will be unsupportive of property regulation, there is virtually no empirical data about the public at large, particularly in Canadian provinces. As discussed below, buy-in from landowners will be absolutely necessary for policy implementation but presently that is putting the cart before the horse. Attitudes toward private property in Saskatchewan, and in other provinces, are unknown. Thus, the goal of the present study is to uncover these attitudes as well as attitudes toward species at risk and government involvement in conservation. This is not a study about environmental values or attitudes defined broadly. Instead the main focus is much narrower and is designed to help guide public policy in the area of species at risk management, which Saskatchewan is lacking. The attitudes of registered voters are examined because this segment of the population will need to support the creation of new legislation and will also need to help finance the development and implementation of stewardship funds, if such an approach is taken (as done with SARA). Hypotheses stemming from the literature are outlined

below, but give that so little empirical data about Canada, the situation in Saskatchewan is also somewhat of a *tabula rasa* so the expectations are also part of theory building.

Research Questions

Given that most endangered species habitat is found on private property, how do we get private landowners to steward endangered species? This is no easy feat and something that the United States has been grappling with for over 40 years, or at least since it passed the Endangered Species Act in 1973. As per the 1992 UNCBD and the 1996, Saskatchewan needs to create stand-alone species at risk legislation. But what kind of legislation should it create? What kind of public knowledge and public support exists for legislation in the province? And perhaps most importantly, what do people think about private property - how willing are they to accept regulation for the purposes of conservation?

Saskatchewan is a prairie province in the heart of Canada. It is bordered by Alberta on the west, Manitoba on the east, the North West Territories to the north and the U.S. states of Montana and North Dakota to the south. (See Figure 1 for a regional map). With two natural regions, the Canadian Shield and the Interior Plains, Saskatchewan is covered mostly by boreal forest and Great Plains prairie (except for the Sand Dunes in the Western part of the province). The major industries are agriculture, mining (potash and uranium), forestry and oil and gas. This province is an excellent case study for species at risk policy for numerous reasons.

First, as mentioned, Saskatchewan is one of the four provinces that have no stand-alone endangered species policy. This puts Saskatchewan in a good position to make future policy consistent with SARA and the UNCBD. Moreover, Saskatchewan has a vast wealth of wildlife and plants that are of critical importance to Canada and to the rest of the world. Presently there are seventy-six SARA listed species (two amphibians, seven arthropods, thirty birds, nine fish, eight mammals, one moss, three reptiles, and sixteen plants) that reside either solely or partially in Saskatchewan. The provinces' Wildlife Act also includes 15 species at risk, three of which are already extirpated (Greater Prairie Chicken, Black-footed ferret, and the Plains Grizzly Bear). Of the remaining twelve, five are endangered birds, one is a mammal and six are plants. The Act mandates that these plants and animals, although not their habitat, be protected from being disturbed, collected, harvested, captured, killed and exported. However, no recovery plans have been created for any of these species. Thus, under the Wildlife Act and under SARA, endangered species and their habitat are not being effectively protected.

Within Canada, Saskatchewan is home to native grasslands, of which only 20% remains in the wild. This is wrecking havoc on grassland birds and, according to the North American Breeding Bird survey, "grassland birds show the most consistent widespread and steepest decline of any group of birds in North America" (Nature Saskatchewan 2010). One prominent example is the decline of the Burrowing Owl because its population has declined 93% in the last 20 years – largely due to changes in the prairie landscape, which have resulted in an 80% decline in prairie grass and a 40% decline in wetlands (Nature Saskatchewan 2009). Also significant is that Saskatchewan and Alberta have the last surviving Sage-grouse in Canada, and it is estimated that the population will be extirpated in the next few years (Herriot 2011, 12). Threats to biodiversity are only increasing in the prairies and Saskatchewan needs policy in place to protect was is left and try to recover some of what is being lost.

Second, Saskatchewan is also a valuable case study because the province is home to large number of private landowners, both urban and rural. In southern Saskatchewan about 80% of the

land is privately owned. This land is predominately farmland, as 46% of the provinces total land is devoted to agriculture (crops and pasture). In fact, only 8% of Saskatchewan's total land is protected area (national or provincial parks and wildlife habitat areas). Even though urban landowners do not take up a lot of space (they comprise less than .5% of total land in the province), urban areas are where over 85% of the population lives. Thus, to some extent the voting power lies in urban areas making the attitudes of urban landowners and residents important for two reasons: they vote lawmakers into office and they own land that is shared by endangered species. Therefore, both rural and urban people are significant because their attitudes could greatly impact the political and ecological landscape of Saskatchewan.

The main research question of this paper is: how do registered voters in Saskatchewan feel about (a) species at risk?; (b) private property?; and, (c) government regulation for the purposes of conservation? Based on the literature in the field, three hypotheses are tested:

H1: Respondents will know very little about legislation or endangered species in Canada and Saskatchewan, but yet generally support the idea of protecting endangered species.

(a) Rural people will know more than urban people about endangered species.
(b) Women will be more supportive of protecting other species than men

H2: Respondents will not support the regulation of private land.

(a) Rural respondents will be less supportive than urban respondents.
(b) Conservative respondents will be less supportive than liberal respondents.

H3: Respondents will support the creation of laws for the protection of species at risk.

(a) Rural respondents will be less supportive than urban respondents.
(b) Conservative respondents will be less supportive than liberal respondents.

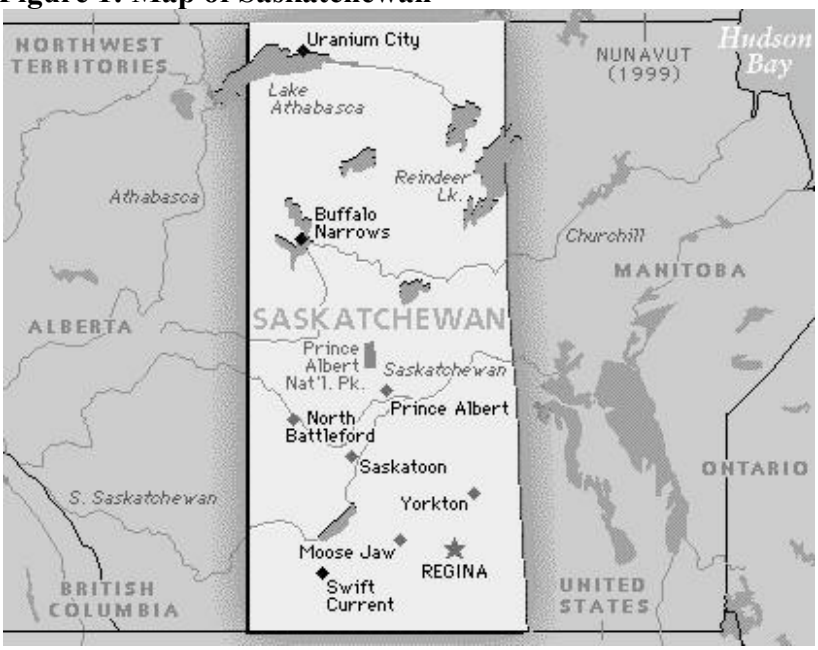
Methodology

Saskatchewan, with a population of just over 1 million people, has 15 cities in total, the three largest of which are Saskatoon, Regina, and Moose Jaw. For this study 250 registered voters were sampled in four cities for a total of 1000 sampled voters. Swift Current was selected for inclusion as a fourth case on the basis that is the largest city in the southwest part of the province, where most species at risk are found. Moreover, this bifurcates the sample between urban centers (Saskatoon and Regina) and more rural centers (Moose Jaw and Swift Current). A brief description of each city is provided in Table 1 and a map indicating their position in the province is provided in Figure 1.

Table 1: Description of Case Study Cities in Saskatchewan

	Regina	Saskatoon	Moose Jaw	Swift Current
Population 2011	193, 000	234,000	37,000	15, 503
Total area	145 km sq	170 km sq	46 km sq	42 km sq
Major industries	Oil, natural gas	Potash, oil	Oil, agriculture	Agriculture
Ecosystem	Moist mixed grassland	Moist mixed grassland	Moist mixed grassland	Mixed grassland

Figure 1: Map of Saskatchewan



Each randomly selected voter was mailed to their home address a letter briefly describing the study, a two-page survey, a one page demographic questionnaire, and a return stamped envelope. All 1000 surveys were mailed in January 2012, and in March 2012 a shortened version of the survey was sent to all non-respondents. In total, 369 surveys were returned for a response rate of 37%. The most surveys were received from Saskatoon with the least from Swift Current but overall a similar number from each city was returned: out of the 369 responses there was 25% from Moose Jaw, 24% from Regina, 28% from Saskatoon and 22% from Swift Current. There are no reasons to suspect response bias as the non-responses is not limited to one segment of the population (as the demographic variables will illustrate).

All responses were coded, mostly on a scale from 1 (strongly disagree) to 4 (strongly agree) and entered into a SPSS spreadsheet. Only two questions were open ended: can you name an endangered species in Saskatchewan?; and, can you explain why species are endangered in Saskatchewan? Individual responses were recorded for all 369 respondents. This paper presents frequencies as well as regression analysis. There are six main demographic variables, used as independent variables in the regression models. The variable "urban" is coded 1 for Regina and Saskatoon, and coded 0 for Moose Jaw and Swift Current; "Gender" is coded as 0 for man and 1 for woman; "Age" is on a scale from 0 to 5 (the categories are in table 2); "Income" is also on a scale from 0 to 3; "Education" is on a scale from 0 to 4 and "L-C" representatives a self-reported "liberal-conservative" scale where 1 is liberal and 7 is conservative. The main dependent variables are attitudes to other species, attitudes toward private property and attitudes toward government regulation for the purposes of conservation. These variables are outlined in the tables below.

Results

The demographics of respondents varied greatly. Table 2 illustrates the variation between sample locations (the four cities) as well as the discrepancy between the sample population and the general population in Saskatchewan. Of particular interest is the age of the sample respondents, which is not representative of the population at large. Almost half the sample is older than 61 years old. This is not surprising for survey research where it is expected that the retired population have more time (and perhaps desire) to participate in studies. The fact that the sample is skewed toward the older population is not necessarily a negative feature since it has been illustrated that older people are more likely to vote in elections (Barnes 2010; Burgar and Munkman 2010). Thus, if we are concerned with residents' attitudes because they are ultimately responsible for voting policy into effect, then the sample might be a better indicator of attitudes than a sample skewed toward youth attitudes. Moreover, outside of age, the sample population is generally representative of the overall population in Saskatchewan. This is important because there is adequate variation on all explanatory variables and because there is little reason to suspect response bias. For example, the sample is not predominately female New Democrats from urban areas. Instead, individuals from different political parties, different religious groups, and various education and income brackets responded.

Table 2: Sample and Population Demographics

Demographic	**Saskatoon**	**Regina**	**Moose Jaw**	**Swift Current**	**Total Sample**	**Saskatchewan**
Gender						
Male	48%	48%	56%	66%	**54%**	49.5%
Female	52%	52%	44%	34%	**46%**	50.5%
Age						
15% 18 - 30	2%	7%	4%	8%	**5%**	15%
31 - 60	48%	42%	53%	42%	**46%**	65%
>61	50%	51%	43%	50%	**49%**	20%
Income						
< 25	22%	24%	12%	15%	**20%**	Median
25 - 50	31%	37%	36%	31%	**33%**	income per
50 - 100	35%	24%	36%	36%	**32%**	capita is $35,
>100	12%	15%	16%	18%	**15%**	948
Education						
Elementary	9%	7%	8%	11%	**9%**	22%
High school	25%	45%	25%	39%	**33%**	25%
College/diploma	66%	48%	67%	50%	**58%**	53%
Religion						
Protestant	36%	46%	39%	43%	**41%**	47%
Catholic	26%	19%	23%	20%	**22%**	32%
Christian*	16%	13%	19%	28%	**19%**	4%
Other	22%	22%	19%	9%	**18%**	17%
Political Party						
Sask. Party	32%	35%	49%	68%	**45%**	64%

Liberal	14%	14%	7%	8%	**11%**	1%
NDP	45%	35%	35%	17%	**34%**	32%
Green	4%	7%	3%	2%	**4%**	3%
Other**	5%	9%	6%	5%	**6%**	0%

* Christian other than Catholic or Protestant

** This category includes "independent" as well as the few people who indicated parties like Marxist and Libertarian.

Respondent attitudes, as frequencies, are presented in the aggregate (all four cities combined) and sub-grouped by hypotheses. Following a brief discussion of attitudes, regression analysis is used to explore statistical relationships between demographics and various attitudes. Implications and conclusion are presented in the final section of the paper.

Hypothesis 1

As Table 4 makes evident, respondents know very little about endangered species or endangered species policy in the province. It is true that 65% thought they could name a species, but some people misidentified a species. For example, five respondents listed "snowy owl," which is a species found in Saskatchewan but if anything this owl is thriving in the wild - nowhere near in danger of extinction. Another two respondents listed "red fox," which is another species in great abundance in the province. Moreover, not one respondent, out of 369 said "prairie grass" or listed another plant species, even though plants represent some of the most endangered species in the province. In fact, of the respondents who could correctly identify an endangered species (only 48%), 78% listed the "Burrowing Owl." It is good for the Owl that so many people are aware of its plight, but somewhat surprising that so few other species could be named despite their endangered status.

Also surprising is that while 22% claim to be familiar with SARA, 92% think it applies to their property. This is important for two reasons: first, 70% of people admitted that they are unfamiliar with a federal law. Second, 92% of the respondents were incorrect: SARA does not apply to private lands. Likewise, a majority of respondents claimed to be familiar with the Wildlife Act but only about the same number thought the Act applied to them. While in most cases these respondents would have little interface with wildlife issues, it is far more likely that the Wildlife Act would pertain to them than SARA. This suggests that people in Saskatchewan are either misinformed or simply under-educated about species at risk in the province.

Table 3: Knowledge of, and attitudes toward, endangered species and legislation from Respondents in 4 sample cities (Aggregated)

Question	Agree/Yes	Disagree/No	Don't Know
Are you familiar with the Saskatchewan Wildlife Act?	59%	24%	17%
Are you familiar with the Species at Risk Act?	22%	56%	22%
Can you name an endangered species in Saskatchewan?	65%	35%	0%
Can you name a reason why species are endangered in Saskatchewan?	47%	53%	0%

Do you think the Wildlife Act applies to your property?	66%	44%	0%
Do you think SARA applies to your property?	92%	8%	0%
Would you agree it is important for human beings to protect other species?	96%	3%	1%
Do you agree that other species have a right to exist?	82%	11%	7%
Is it okay for human beings to let other species go extinct because of human activities?	17%	70%	13%

- rows may not add to 100% due to rounding

Despite their lack of information about endangered species and legislation, respondents were generally quite supportive of conservation. Almost all landowners agreed that it is important for human beings to protect other species. Such agreement suggests response bias where individuals are providing what they consider to be the "right" answer or the "socially acceptable" answer. Even if this is the case, there is still reason to suspect that a majority or respondents feel that protection is important. Furthermore, most landowners feel that other species have a right to exist and are generally against human-caused extinction. This indicates strong support for the protection of other species in the province.

OLS regression analysis reveals that there is no statistically significant relationship between demographics, including urban-rural, and support for conservation. See table 4 for results. This means that women and liberals were no more likely than anyone else to know about legislation or support conservation. However, rural residents (those living in Moose Jaw and Swift Current) as well as the more educated were more likely to be able to name an endangered species in the province. But since the model is not significant it is difficult to interpret the result and too much emphasis cannot be placed upon the finding. Regulation results suggest a more complex explanation than demographics for attitudes toward the protection of other species.

Table 4: Regression Analysis for Attitudes and Knowledge

Variables	Urban St. Co°	Gender St. Co	Age St. Co	Income St. Co	Edu St. Co	L-C St. Co	Adjusted R^2	F-test
Familiar with Wildlife Act?	-.08	.069	.173	.076	.04	-.003	.008	.826
Name a species in SK?	-.169*	-.007	.055	-.013	.149*	-.08	.014	1.350
Agree it is important to protect other species?	.082	.081	.022	.031	.028	.075	.017	.535
Agree other species have a right to exist?	-.048	.075	.022	-.025	-.099	-.024	.017	.534
Agree Extinction is okay?	.011	-.136	.091	.087	-.100	-.035	.04	1.109

° Standardized Co-efficient

* P<.10

Hypothesis 2

Overall respondents had mixed feelings about private property. When asked if they think private property is an absolute right only a fifth of respondents agreed, but when asked if property is more of an instrumental right, half agreed. See table 5 for results. Nevertheless, in both questions a large number of individuals, a quarter for each question, were unsure of how they felt. The questions are fairly abstract and come from an interview instrument used in prior research. In order to clarify attitudes, respondents where also asked if they agree more with the absolute view, more with the instrumental view or would place themselves in the middle. In total, 35% felt closer to the instrumental view, 11% closer to the absolute view, 24% were in the middle and 30% could still not decide. Thus, it is only possible to conclude that there is more support for the instrumental notion of private property than the absolute notion, but how strong that support is remains unclear. However, respondents were much clearer in their attitudes toward trust. The vast majority of respondents say they trust the government to protect private property rights in the province.

Table 5: Attitudes toward private property by respondents in sample cities (aggregated)

Question	Agree/Yes	Disagree/No	Don't Know
Some people think of private property as an absolute or "God-given" right that must be respected by a legitimate government. What do you think of this view?	17%	55%	26%
Some people think of private property as a right created by government that can be changed over time according to the changing needs to society? What do you think of this view?	48%	20%	32%
Do you trust the government to protect private property rights?	86%	10%	4%
Do you think it is unfair to expect landowners to bear the cost of protecting endangered species on their own property?	62%	18%	20%

In terms of the relationship between property and regulation, a majority of respondents felt that it would be unfair for the government to expect landowners to bear the cost of conservation on private lands. This is similar to prior research where landowners in Indiana and Utah (Raymond and Olive 2008, Olive and Raymond 2010), as well as Ohio and Ontario (Olive 2012) agreed that it is unfair for landowners to have shoulder the burdens of conservation. Even though respondents agreed that property is something created by government and responsive to societal needs, there is more hesitation about actually expecting property owners to pay for the protection of a social good.

Table 6: Regression Analysis for Attitudes toward Property

Variables	Urban St. Co°	Gender St. Co	Age St. Co	Income St. Co	Edu St. Co	L-C St. Co	Adjusted R^2	F-test
Agree that property is an	-.17**	-.14*	-.10	.12	.06	-.47	.22	6.815***

absolute right								
Agree that property is an instrumental right	.066	.10	.090	.233**	.057	-.104	.03	1.684
Trust government to protect property rights	-.054	.094	.008	-.013	.049	.018	.013	.364
Agree it is unfair to landowners	.089	-.001	-.037	.081**	.062	.229**	.033	1.825**

° Standardized Co-efficient
* P<.10; **P<.05; ***P<.01

Unlike the models above, regressing demographic variables against property attitudes proved more fruitful. Gender and urban living significantly predict attitudes toward private property. And the relationship is in the expected direction whereby urban respondents, those living in Regina and Saskatoon, were less likely to agree that property is an absolute right. And women were also less likely then men to agree that property is an absolute right. The models for instrumental property views and trust in government were not statistically significant, but political ideology is a significant predictor of attitudes toward fairness. The more conservative a respondent is, the more likely he or she is agree that it is unfair for the government to expect landowners to bear the costs associated with conservation. Here, income was also significant with wealthier respondents more likely to agree it is unfair. It is important to note that no other variable was a significant predictor, including rural location.

Hypothesis 3

A large number of respondents think that the government should be involved in conservation and almost as many think the government should make laws to protect species. See table 7 for results. However, far fewer, but still a majority, of respondents, think that the government should punish people who violate conservation laws. What is most revealing is the sudden drop in support from conservation laws (95% support) to laws with sanctions (60% support). In the latter category, almost a quarter of respondents where unsure suggesting both that the question is too vague and/or that the actual sanction may be important (a small fine might be okay but imprisonment might not be acceptable).

Table 7: Attitudes toward Conservation laws by respondents in sample Cities (aggregated)

Question	**Agree/Yes**	**Disagree/No**	**Don't Know**
Do you think the government should be involved in the conservation of species at risk?	95%	1%	4%
Do you think the government should make laws to protect species?	90%	3%	7%
Do you think the government should punish people who violate conservation laws?	60%	17%	23%

Examining the relationship between demographics and attitudes toward regulation, the

only statistically significant model is attitudes toward conservation laws with sanctions. In this case, women and liberals were more likely to agree that punishment is okay. The models for government involvement in conservation and the creation of conservation laws were not significant so the findings about ideology and urban location cannot be clearly interpreted.

Table 8: Regression Analysis for Attitudes toward Conservation laws

Variables	Urban St. Co°	Gender St. Co	Age St. Co	Income St. Co	Edu St. Co	L-C St. Co	Adjusted R^2	F-test
Agree that government should be involved	.046	.008	.080	.053	.121	.205*	.024	1.67
Agree that government should make laws	.142*	.077	.005	.042	.030	.096	.003	.925
Agree that government can punish violators	-.035	.120**	-.015	-.103	.063	-.16**	.018	2.424**

° Standardized Co-efficient
* P<.10; **P<.05; ***P<.01

Since demographics could explain attitudes toward private property, but not toward government involvement (outside of attitudes toward sanctions), I examined whether or not attitudes toward property could help explain attitudes toward other species and attitudes toward government. Essentially, this is to ask: do attitudes about property predict attitudes toward conservation?

Table 9: Regression analysis for attitudes toward conservation with property attitudes as an independent variable

Variables	Absolute St. Co°	Gender St. Co	Age St. Co	Income St. Co	Edu St. Co	L-C St. Co	Adjusted R^2	F-test
Agree it is important to protect other species?	.187*	.071	.032	.092	.056	-.010	.001	1.101
Agree that other species have a right to exist?	.084	.098	.042	.019	-.039	.037	.025	.513
Agree that extinction is okay	-.118	-.116	.115	.004	-.113	.061	.002	.970
Agree that the government should be involved?	-.169*	-.012	.053	.090	.147	.135	.05	1.995*

Agree that the government should make laws?	-.033	.075	.006	.110	.007	.069	.017	.669

° Standardized Co-efficient
* P<.10; **P<.05; ***P<.01

The answer appears to be largely no. The variable "absolute" represents attitudes toward the view of private property in which the right is seen as absolute and unchanging. It was measured on a scale from 1 (strongly disagree) to 4 (strongly agree). The models are not significant, save that of government involvement, and it appears that individuals who agree with the absolute notion of property are not less likely to support conservation law and not less likely to value other species. That said, those individuals who agree with the absolute notion of property are less likely to think the government should be involved with the protection of species at risk. However, they are, surprisingly, not less likely to agree that the government should make laws for conservation. Thus, these individuals may be okay with the creation of conservation laws but they do not want to see the government directly involved in the protection of other species. Further research is required to understand who should be involved, such as non-profits and other non-government institutions, with conservation if not the government itself.

Discussion and Implications

There is limited support for the three hypotheses originally proposed. Regarding the first, respondents did know very little about species at risk and legislation but still supported protecting other species. However, rural individuals did not more about species than urban individuals. It could be the case that the sample is not adequately "rural" as all respondents lived inside a city of ten thousand people or more. While it is true that Moose Jaw and Swift are more agricultural and natural resource based than Regina and Saskatchewan, extraction theory might better apply to smaller communities like villages and towns. Moreover, it is necessary future research to compare across different land parcels like farms and ranches (agricultural rural), small towns (rural), suburban and urban areas. All types of landowners vote and, more importantly, all types of people interact with the environment in ways that effect species at risk.

Women in this study did not care more than men about the protection of species at risk. Empirical data has presented mixed results on gender and attitudes toward wildlife and endangered species. Olive (2012) found that women care differently about different animals such that there was great concern for a tortoise in Utah but virtually no support for endangered snakes in Ohio. Thus, it might matter specifically which species at risk in Saskatchewan are in question. For example, future research should examine attitudes toward species like Burrowing Owls, Swift Fox, the Great Horned Lizard and other species at risk in the province. Men and women might feel differently about these species and outreach and education could be targeted to certain groups. And if we know what women are supportive of specific birds or plants then efforts to involve women, either through financial contributions or directly through conservation initiatives, should be implemented in the province.

Support for hypothesis two is mixed. Respondents were not overly supportive of the regulation of private property but, as hypothesis two stated, rural individuals and conservatives were less supportive than urban and liberal respondents. Almost a majority of respondents feel

that private property is an instrumental right, created by government, than can change over time as the needs to society change. Only rural landowners felt strongly about the absolute notion of property, as they were statistically more likely to agree with that viewpoint. Thus, there is not overwhelming support for regulation, but the fact that a majority did disagree with the absolute notion of property means there is political space, or at least some public support, for the regulation of private land in the province. However, sixty percent of respondents also felt that it would be unfair to expect landowners to bear the costs associated with conservation. This was especially true for wealthy and conservative respondents. This suggests that the province is going to have to work with private landowners, especially in rural and politically conservative areas, to enhance stewardship. This might entail the use of incentives or cost shares program so that landowners do not have to finance conservation out-of-pocket.

Finally, regarding the third hypothesis, residents did support conservation law but rural individuals and conservatives were no more or less supportive of law than urban individuals or liberals. Respondents seemed to favor government involvement in conservation as well as the creation of laws for conservation, but there was less support, albeit still a majority of support, for the use of sanctions against those who would violate conservation laws. Even though rural respondents were more likely to agree with the absolute notion of private property, they did not reject the creation of laws for conservation. This is surprising. Moreover, while conservative respondents thought it is unfair to burden private land with conservation costs, they too did not reject the creation of laws for conservation. They were, however, less supportive of the use of sanctions. So, again, this suggests that the new conservation laws might need to rely upon stewardship funds and incentive programs to ease the burden on private land. A carrot approach would likely be more popular than a sticks approach, but a balance of carrots and sticks seems to have wide public support.

Piecing together these hypotheses and the findings, what does all of this suggest for stand-alone species at risk policy in Saskatchewan? What should new legislation look like? All respondents, regardless of age, income, ideology, education or location, felt that it is important to protect species and prevent (or at least not cause) their extinction. This is a good starting place for the creation of new species at risk legislation in the province. Moreover, the vast majority of respondents, despite demographics, supported government involvement in conservation and the creation of laws for the purposes of conservation. This too bodes well for the prospects of species at risk legislation.

The lack of information about endangered species and current legislation is both surprising and problematic. First, a majority of respondents could not correctly name a single endangered species in the province. Species at risk are obviously not a salient issue and, perhaps, not part of the education system or public discourse in the province. While it is good to know that people still support conservation despite their lack of knowledge, it will be crucial for individuals to know about species - what is endangered and why - in order to steward such species. This is particularly true in Saskatchewan where the prospects of property regulation are low and unpopular. Essentially, the government is not likely going to mandate that landowners conserve species on private property (command and control) thus it will be up to individuals to willingly steward species. That is difficult when so little information exists about endangered species. No one can steward species that they have never of or that they cannot identify in the wild.

If education and outreach are part of the long-term biodiversity strategy in Saskatchewan, then a SARA-like approach might be the best policy to enact. SARA takes a stewardship first

approach to conservation (Smallwood 2003, Olive 2011) by providing funds and incentives to assist conservation on non-public lands. Saskatchewan should follow this lead but back up policy with regulations that apply to all land parcels, such a critical habitat designation and protection. The point is not to punish landowners with species on their land, but to reward them with financial assistance once it has been determined that a species habitat is on the land. This will require the use of taxpayer money, thus it is necessary to have wide public support in urban areas where most taxpayers live and to inform all taxpayers in the province about the value of biodiversity. My data suggests there is public support for conservation laws but there is a lack of knowledge about species.

Lastly, before any policy can be created other stakeholders, most notably agricultural landowners, will need to be included in public discourse. Agricultural landowners are obviously rural (with the few exceptions of farmers who live Saskatchewan's larger cities) and rural parts of Saskatchewan tend to be quite conservative. In the 2011 election the Saskatchewan Party (far right) won the majority of seats (49), while the New Democratic Party (far left) won the remaining 9 seats - all in urban areas (in fact, all in Regina and Saskatoon). Given the conservative and rural nature of agricultural parts of Saskatchewan, future research will need to focus on their attitudes toward private property and regulation. Moreover, it is also essential to uncover what kind of solutions or policies rural or conservative respondents will support for conservation. While it may be that farmers and other rural residents are no more or less concerned about biodiversity than their urban counterparts, they may be less supportive of specific policy approaches, especially land-use regulations for rural residents (Connerly 1986; Freudenburg 1991 ; Van Liere and Dunlap 1981) and proposals that seem to threaten their sense of identity, place, and way of life (Carroll 1995 ; Carroll and Lee 1990). This all needs to be considered before Saskatchewan moves forward with new legislation.

Canada has a rich array of natural capital and, in 1992, became the first country to ratify the UNCBD, committing itself to the protection of biodiversity. The estimated value of the ecological goods and services in various Canadian eco-regions ranges from $2.6 billion per year from southern Ontario's Greenbelt13, to $5.4 billion from B.C.'s lower mainland14, to $703 billion per year from Canada's boreal forests (Kenny et al. 2011). As Canada continues to urbanize and as climate change threatens species from coast to coast, it is absolutely essential that individual provinces join forces with SARA to confront, and potentially reverse in some cases, biodiversity loss. Saskatchewan residents value other species and support the creation of conservation laws. It is time for the province to create stand-alone species at risk legislation that respects private property but at the same time meaningfully protects the precious biodiversity.

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