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State Environmental Protection Efforts, Women's Status, and World Polity

A Cross-National Analysis

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There is a large focus at the organizational level on the importance of a link between women and the environment, yet little empirical research explores this. We examine how women's status in economic, political, educational, and health spheres affect state environmental protection efforts in the form of protected land area. Hypotheses derived from ecofeminism and empirical literature of gendered differences in individual-level attitudes and behaviors are tested using multiple regression models with a cross-national sample. We find no support for broader ecofeminist claims that the overall oppression of women and environmental degradation are linked by a common source. However, we find strong support for the idea that increasing women's political status in particular through representation in national government has a positive effect on state environmental protection efforts. We also find no evidence that connection to a world polity has a significant effect on nation-state designation of protected land area.

Keywords: *ecofeminism; state environmental protection; women's status; world polity; protected land area; cross-national*

Global political efforts to address the unique needs of women have increased over the past decades, powered by the United Nations and groups like the Women's Environment and Development Organization, which advocates for involving women in environmental decision making. Ensuring that women are represented in environmental decision-making is understandable given that women are in a position of being uniquely and disproportionately affected by environmental degradation outcomes due to domestic responsibilities for provision of water, food, and fuel; serving in roles as caregivers; and higher rates of poverty among women (Bretherton, 1996; Rocheleau, Thomas-Slayter, & Wangari, 1996; Seager, 1993; United Nations Environment Programme, 2004). However, the proposition that women's participation in environmental decision-making may generate beneficial results for the environment is an area largely unexplored in current cross-national literature—see Norgaard and York (2005) as a notable exception—as is a link between environmental protection and gender equality more generally.

Thus, we seek to address this gap in cross-national literature by considering how women's status in economic, political, educational, and health spheres affects state environmental

protection efforts. This research also contributes to the cross-national literature by examining an underused measure of environmental protection behavior—protected land area within nations. Of course, we also examine insights from other important theoretical perspectives, especially world polity theory, which argues that nation-states' political behavior is highly influenced by involvement in a larger institutional system or world society. We conclude with a discussion of theoretical, methodological, and policy implications of this research.

Theoretical Insights From Ecofeminism and Feminist Political Ecology

Although a potential relationship between gender and the environment is currently neglected in cross-national environmental research, there is theoretical and empirical support for such a relationship. From a theoretical standpoint, Rocheleau et al. (1996) argue that gender and the environment intersect through three themes. First, the *gendered science of survival* recognizes women's efforts to develop environmental sciences and movements that reflect local knowledge and practices of everyday life. Second, *gendered environmental rights and responsibilities* recognizes that environmental rights of control and access are gendered, as are both responsibilities to obtain and manage household and community resources and the actual practices of their use. Finally, *gendered environmental politics and grassroots activism* acknowledges the recent wave worldwide of women's involvement in collective political struggles around environmental change.

Moreover, the ecofeminist theoretical perspective also links gender and the environment, arguing that gender discrimination and environmental degradation have a social structural source in common—patriarchal domination (Bretherton, 2003; Gaard, 1998; Littig, 2001; Merchant, 1980; Seager, 1993). Warren (2000) reviews multiple ways in which various ecofeminists have claimed that a connection between the domination of both women and the environment is evident, including through language that feminizes nature, symbolic and literary representations, religious imagery, and empirical evidence about how women disproportionately suffer the risks and consequences of environmental degradation. This fact that women are more affected by negative ecological changes, along with the position they occupy as nurturers, lead some ecofeminists to make a narrower claim that women have a closer relationship to nature, although even ecofeminists themselves disagree about the degree to which such a connection is socially constructed. Because of this connection, some ecofeminists contend that women are better able than men to recognize destructive relationships between humans and nature and to create positive change (Littig, 2001).

This notion that women are more attuned to and concerned about the negative impact of humans on nature is supported empirically by research which shows that women and men differ in environmental values, attitudes, and behaviors. Davidson and Freudenburg (1996) reviewed articles examining gender differences in environmental concern and found that women were more concerned than men in 56 out of 58 of those studies assessing differences in concern about nuclear power and radioactive waste and other risk-related environmental issues. A study by Mohai (1997) found that nearly every issue listed under "pollution," "nature preservation," and "global environmental problems" categories was rated as a serious problem by significantly more women than men. Szagun and Pavlov's (1995) study of adolescents in Germany and Russia found pronounced gender differences,

with females having not only stronger emotions about environmental destruction but also more willingness to engage in pro-environmental lifestyle and political behaviors. Zelezny, Chua, and Aldrich (2000) also found evidence that females have stronger pro-environmental attitudes and behaviors than men in their study of 14 countries. In fact, gender had a stronger relationship to pro-environmental behaviors than did environmental attitudes themselves. Finally, on a much larger cross-national scale, Hunter, Hatch, and Johnson (2004) found that in most of the 22 nations in their study, women tended to engage in more pro-environmental behaviors than men, especially in areas such as recycling and cutting back on driving for environmental reasons.

Furthermore, these pro-environmental behaviors and attitudes have been observed to extend beyond the individual, everyday level to larger-scale participation in environmental movements and green agendas. It was women's clubs in particular that made a substantial contribution to environmental protection in the United States during the progressive conservation crusade of the early 20th century, making significant impact in the areas of preservation of bird species (Forbes & Jermier, 1992; Merchant, 1996), state forest reserves, and water sanitation and conservation (Merchant, 1996). Environmental organizing in the United States has continued to be supported primarily by women, with women comprising 60% to 80% of membership in mainstream environmental groups and much more than that in grassroots environmental groups (Seager, 1996).

Zelezny and Bailey (2006) argue that women may be uniquely called to leadership in environmental activism and describe two case studies that exemplify the essential role played by women environmental leaders. The Chipko Movement, founded by women in India in the 17th century, is still led primarily by women, and the Green Belt Movement in Kenya was pioneered by Nobel Prize winner Wangari Maathai, who is widely recognized for her environmental leadership in a place and time largely intolerant of women in positions of power. The previously mentioned review conducted by Davidson and Freudenburg (1996) also noted a trend in findings from case studies, where women are particularly prominent "in leadership roles among local opponents of toxic waste storage sites, hazardous waste incinerators, and the like" (p. 315). In addition, Green Parties worldwide are disproportionately high in female membership, and in Europe Green Party parliament members are more often women than men—32 out of 55 German Green Party parliament members are women, 9 out of 14 Green parliament members are women in Finland, and in the Netherlands women are 6 out of 11, for example (Momaya, 2008).

Clearly, previous theoretical and empirical research as well as documentation of women's involvement in pro-environmental agendas point to a link between gender and the environment that could have implications on a larger scale in two ways that are tested in the current study. First, ecofeminists claim that the domination of women and the degradation of the environment are interrelated and stem from the same source. Furthermore, some ecofeminists argue that "women's emancipation goes hand in hand with the establishment of nondestructive and power-free nature-society relationships" (Littig, 2001, p. 26), and that both women and nature can be liberated together (Merchant, 1996). If this assertion is true, women's empowerment and improved status should witness a corresponding rise in environmental protection efforts. Second, empirical research and documentation of women's activism suggests that women tend to have more pro-environmental attitudes and behaviors than men and are more likely to be involved in green agendas. Therefore, perhaps more

substantial environmental protection and conservation outcomes can be seen when women are politically empowered to exert their voice and influence, such as through voting or involvement at higher levels of government and policy-making.

In their forward-looking study, Norgaard and York (2005) used similar arguments when they examined the relationship between gender equality and state environmentalism. They found that countries with a higher proportion of women in national parliament are more likely to ratify international environmental treaties. In fact, women's representation in parliament had a stronger association with their measure of state environmentalism than any other factor except gross domestic product per capita and population size, which were both positively associated with ratification of environmental treaties. Furthermore, although their results show that nations with higher levels of modernization are more likely to support environmental treaties, Norgaard and York (2005) also point out that these nations are some of the largest polluters in the world. Thus, they suggest that environmental treaty ratification and genuine protection efforts may not be synonymous, where countries might sign environmental treaties but not actually implement environmentally responsible behaviors. As a result, gender equality may not translate into actual conservation efforts that protect the natural environment. Clearly, additional research is needed to examine whether or not gender equality can affect *measurable* environmental protection efforts like protected land area.

Considering Protected Land Area

One such outcome that exemplifies actual protection efforts made by nation-states is the designation of land areas to protected status. Dudley and Stolton (2003) write, "Protected areas are the cornerstones of all national and regional conservation strategies" (p. 26). These areas are critical to ecological restoration through protection of ecological processes and preservation of biodiversity, as well as providing flood and storm protection, soil stabilization, and conservation of watersheds, which supply significant proportions of the world's drinking water (Carey, Dudley, & Stolton, 2000). The International Union for Conservation of Nature and Natural Resources (IUCN) maintains data on protected land area for a large sample of nations and currently identifies six different categories of protected areas: strict nature reserves and wilderness areas, national parks, natural monuments, habitat/species management areas, protected landscapes/seascapes, and managed resource areas (sustainably managed ecosystems).

Despite the clear importance of protected areas as an indicator of environmental protection efforts, only a few cross-national studies have been published that examine this topic. For instance, Frank, Hironaka, and Schofer (2000) agree that this variable illustrates "the embrace of responsibility for the natural environment by the nation-state" (p. 97) and used a version of it—cumulative numbers of national parks per nation-state—as one of five indicators of nation-state involvement in environmental action. Their event history analysis found that nation-states with more connections to world society through international nongovernmental organizations (NGOs) and intergovernmental organizations (IGOs) created more national parks.

Midlarsky (1998) also used protected land area in the context of environmental politics, where it was one of six dependent measures of environmental protection or degradation,

with democracy being the independent variable of interest. Although democracy did not appear to operate in a unidimensional way—it had varying effects on each of the six dependent variables—it did increase protected land area. Furthermore, Bates and Rudel (2000) examined the determinants of the percentage of protected forest area in tropical nations. They found evidence for the idea that protected area designations were facilitated first by rapid deforestation, which sparked environmental activism and led to a mobilized and supportive public, and by governments' political and fiscal support.

Ideas regarding gender equality theory are absent from these analyses despite plausible predictions made by this perspective. Thus, we examine cross-national models of protected land area that draw on key insights from these studies while also considering the influence of women's economic, political, educational, and health equality.

Methods and Data

This study is interested in the relationship between women's status and environmental protection efforts, both in terms of status overall and specifically in the arena of political decision-making through voting and representation in government positions. First, we evaluate the broader ecofeminist claim that the status of women and level of degradation of the environment are interconnected systems of oppression sharing a common source. We operationalize status using the dimensions represented in current indices of generalized women's empowerment and gender equality by groups such as the United Nations, World Economic Forum, and Social Watch. Current efforts to capture women's status or gender equality in a single index tend to incorporate variables representative of four areas of opportunity and participation: education, economic/labor, health, and politics. In addition, the United Nations Millennium Development Goal to promote gender equality and empower women uses indicators representing educational, labor, and political arenas. To be congruent with these prominent measures that are being used in human development analysis and informing policy work, we choose to include these four areas in our conceptualization of overall women's status.

Given the theoretical arguments that empowering women and liberating nature from destruction go hand-in-hand, we hypothesize that improved women's status in each of these four areas should pair with higher rates of environmental protection efforts. Theoretically, this makes some sense—"Given equal educational opportunities to become scientists, natural resource managers, regulators, lawyers, and legislators, women, like men, can contribute to the improvement of the environment, the conservation of natural resources, and the higher quality of human life" (Merchant, 1996, p. 9). Capital in the form of education, economic, health, and political resources and status all contribute to the ability and likelihood of achieving desired outcomes of any kind, be they women's environmental conservation agendas or otherwise.

It should be noted that critiques may suggest that the areas of educational, economic, health, and political empowerment/inequality mutually reinforce one another and in some ways overlap, and explaining how this might be so is beyond the scope of this article. In this analysis, the four areas are treated as separate spheres for two reasons. One is that there is not a sufficient number of cases present to build a single index composed of these four areas that accurately represents the variety of types of empowerment variables that can

contribute to each of the subareas of educational, economic, health, and political empowerment. The other reason for treating the four areas as separate spheres analytically is that if an overall index of women's empowerment status is used, then we would not know whether there are one, two, or three subareas that really matter more than others, and perhaps more than the overall index itself. We perform this step of breaking down overall status into subareas and comparing their respective contributions from the outset. Therefore, this research can aid in providing an in-depth assessment of both the potential and limitations of using indices of generalized women's empowerment and equality like those generated by the World Economic Forum, Social Watch, and the United Nations.

Our second examination draws from empirical research and documentation of women's activism, which suggests that women tend to have more pro-environmental attitudes and behaviors and are more likely to be involved in green agendas. It is also informed by the parallel or complementary claim made by some ecofeminists that women have a special connection with nature which enables them to better recognize destructive relationships between humans and nature, and more important, to create change. We hypothesize that women's greater pro-environmental attitudes, behaviors, and involvement in green agendas should be reflected in environmental protection outcomes if women are given more political power and voice through voting and decision-making positions in government. Thus, an increase in women's political power should witness a corresponding increase in state environmental protection. Also, because one aspect of this study examines women's political power in government, there is a unique opportunity to assess it in the broader political context of world polity theory.

All variables in the analysis, described below, were checked for skewness and transformed if the skewness statistic was greater than three times its standard error. Also, when regression diagnostics using Cook's *D* suggested the presence of influential cases, the analysis was rerun deleting those cases. If the basic pattern of results did not dramatically change, those cases were left in the analysis with confidence in the validity of those equations. If the pattern was substantially changed, results are presented excluding these cases. In addition, variables were monitored for multicollinearity problems through looking for variance inflation factors (VIFs) above 10. All variable sources, dates, and transformations can be found in Appendix A, whereas descriptive statistics and a bivariate correlation matrix are provided in Appendix B.

Sample size guidelines concerning the appropriate ratio of cases to predictors vary across scholars, but we use Polit's (1996) guideline of 10 cases to every one predictor. Although we strove to use a consistent sample of cases across all models, this was not possible in three models. The smaller number of cases present in the education, labor, and health components did not cross over well enough with the political variables to satisfy an appropriate ratio of cases to predictors when using listwise deletion. To maximize the use of available data on these three independent variables, we allow the sample size in those models to vary depending on data availability. However, the sample used in all other models where political variables are directly compared is composed of the 90 nations containing data on all dependent and independent variables when listwise deletion is used.[1,2]

We would also like to note that our models are cross-sectional in nature by design. There is little comparative data for key independent variables at earlier time periods (e.g., number of IUCN memberships and number of environmental IGO memberships). This limits our

ability to discuss how the independent variables affect change in protected land area over time. Thus, inferences drawn from the analysis should be made with caution.

Dependent Variable

Protected land area. The measure of state environmental protection in this analysis is the percent of total land area under protected area status, including all six of the IUCN categories of protected area designation: Category I, Strict Nature Reserves and Wilderness Areas, managed mainly for science or wilderness protection; Category II, National Parks, managed for ecosystem protection and recreation; Category III, Natural Monuments, managed for conservation of specific natural features; Category IV, Habitat/Species Management Areas, managed mainly for conservation through management intervention; Category V, Protected Landscapes and Seascapes, managed primarily for landscape/seascape conservation and recreation; and Category VI, Managed Resource Areas, managed for the sustainable use of natural ecosystems (IUCN, 2000).

Independent Variables: Women's Status Variables

Women's status variables are the primary independent variables, which are drawn from four areas of opportunity and participation: education, economic/labor, health, and politics. To reduce the number of women's status variables, components of women's status were built using principal components analysis. Four separate component indices were built to represent women's status in the areas of education, economic/labor, health, and politics. All variables within each group correlated significantly with one another at the .01 level, justifying their inclusion in their respective groups. The loadings for each index can be found in Table 1. If broader ecofeminist claims are correct that women and nature share a structural source of oppression, then improvements in women's educational status, economic/labor status, health status, and political status should each witness an increase in protected land area.

Index of women's educational status. To compose the index of women's educational status, we use three variables related to access to education by gender. First, the female to male ratio of average length of schooling represents the average length of schooling in years that female versus male students remain at school and university, including years spent on repetition. Second, the gender parity index for gross enrollment ratio is the ratio of the number of female students enrolled at primary, secondary, and tertiary levels of education to the number of male students in each level, standardized for the effects of the population structure at each level. Third, the ratio of female to male adult literacy rate is the ratio of the percentage of females older than age 15 to the percentage of males older than age 15 who can both read and write with comprehension a short, simple statement about everyday life.

Index of women's economic/labor status. The index of women's economic/labor status captures women's economic opportunity and participation. For economic/labor variables, first we use the ratio of estimated female to male earned income, which is a ratio of the estimated annual earning power available to women working in the nonagricultural sector to the estimated annual earning power available to men working in the nonagricultural sector.

Table 1
Factor Loadings of Variables on Women's Status Component Indices[a]

	Women's Status Component Indices			
	Education	Economic/ Labor	Politics	Health
Female to male ratio of average years in school	0.925			
Gender parity index for gross enrollment ratio, all levels	0.934			
Ratio of female to male adult (aged 15+ years) literacy rate	0.838			
Ratio of estimated female to male earned income		0.861		
Female professional and technical workers (% of total)		0.777		
Female labor force (% of total labor force)		0.914		
Seats in parliament held by women (% of total)			0.831	
Number of years women have had right to vote			0.650	
Women in ministerial government (% of total)			0.797	
Maternal mortality ratio (per 100,000 live births)				0.957
Females with HIV/AIDS (% of total living with HIV/AIDS)				0.698
Female infant mortality (deaths per 1,000 live births)				0.937

a. Not enough cases were available using listwise deletion to perform one factor analysis with all variables together. Four separate component indices were built by running four factor analyses, allowing each group of variables to load on one factor together.

Second, the percentage of female professional and technical workers is women's share of total positions that include physical, mathematical, and engineering science professionals; life science and health professionals; teaching professionals and other (business, social science, legal, religious) professionals. Third, the female labor force participation is the number of females who are working or seeking work as a percentage of the total labor force.

Index of women's health status. The index of women's health status captures the value society places on females with regard to access to and provision of proper health-related care through three variables. First, the maternal mortality rate is the annual number of deaths of women due to pregnancy-related causes per 100,000 live births. Second, the measure of females with AIDS/HIV is the number of women infected with AIDS/HIV as a percent of the total male and female adult population (aged 15 years and older) infected with AIDS/HIV. Last, the female infant mortality rate is the probability of a female child dying before reaching the age of one, expressed as a rate per 1,000 live births.[3]

Index of women's political status. The index of women's political status captures women's access to a political process and includes first a measure of women in parliament, which is the number of seats held by women members in single or lower chambers of national parliament as a percentage of the total seats. Second, the right to vote variable measures the number of years women have had fully recognized rights to vote as of 2004.[4] Third, the measure of women in ministerial government is the number of women in government at the ministerial level as a percentage of the total. Both ecofeminist theory and empirical evidence that women have more pro-environmental attitudes support the notion that higher women's political status should increase protected land area designation.

Independent Variables: Control Variables[5]

Freedom Index. Following Norgaard and York (2005) and Midlarsky (1998), it is important in these models to differentiate women's status from overall political and social freedom, so the Freedom Index is included as a control. This data comes from Freedom House and is an indication of civil and political liberties, such as individuals' ability to participate freely in the political process, vote freely in legitimate elections, join political parties and organizations, exercise freedoms of expression and belief, freely assemble and associate, have access to an established and equitable system of rule of law, and have social and economic freedoms, which include equal access to economic opportunities and the right to hold private property. Both the Political Rights rating and the Civil Liberties rating for each country range on a scale of 1 to 7, with 1 representing the highest level of freedom and 7 the lowest. Just as Freedom House uses the combined average ratings of Political Rights and Civil Liberties to designate each country as free, partly free, and not free, combined average ratings are used here to maintain a single, scaled measure. Bates and Rudel (2000) and Midlarsky (1998) argue that broad popular support is necessary for government officials to designate protected land area status, so higher degrees of freedom (a lower rating on the scale) should increase protected land area.

Gross domestic product. Because gender equality is associated with modernization (Norgaard & York, 2005), as are environmental consequences (Ehrhardt-Martinez, 1998; Shandra, London, Whooley, & Williamson, 2004; York, Rosa, & Dietz, 2003), gross domestic product (GDP) per capita in purchasing power parity for 2004 is included as a control variable. Bates and Rudel (2000) find that prosperous nations are more likely to create protected areas because they have more resources to do so. Therefore, we hypothesize that gross domestic product will increase protected land area.

Rural population density. Carrus, Bonaiuto, and Bonnes (2005) argue that a major barrier in instituting natural protected areas is opposition of local communities and its residents, particularly in highly populated zones. To control for this influence, we include the population density of rural areas as it could be argued that protected areas are more often located outside of urban zones. It is expected that rural population density will be a negative predictor of protected land area.

Region of the world: Latin America and the Caribbean. It is important to control for a country's geographical location when conducting cross-national analyses of this nature. Initially models included controls for other regions of the world, including Africa, Northern America, Asia, Europe, and Oceania. The coefficients for regions of the world other than Latin America and the Caribbean were not significant. Therefore, we do not include them in the models presented here, but those results are available from the authors upon request. We include a dummy variable for whether a country is located in Latin America with a country being coded one if it is located in Latin America or the Caribbean. The reference category includes nations not located in this region of the world and are coded with a value of zero.

International tourism receipts. Although it could be argued that the level of tourism present in a country may be a deterrent to establishing protected land area and may be damaging as a consequence, the IUCN (2000) maintains that ecotourism is critical for many protected areas because it generates income and provides many benefits to local people. If tourism is prevalent in a nation, it may actually be more motivated to preserve and protect that land area in the form of national parks, monuments, nature reserves, and protected landscapes to ensure and stimulate future income via tourism. In addition, tourism could be used as a way of financing the development and management of protected areas. Therefore, we include the variable international tourism receipts, which are the expenditures in million current U.S. dollars made in a country by international inbound travelers staying for less than a year, including payments to national carriers for international transport, and prepayments for goods and services in the destination country. We hypothesize that larger levels of tourism present in a country leads to more protected area designation because tourism can finance protected areas, and also because protection of those areas which are providing important benefits through tourism ensures the future longevity of those areas to continue providing such benefits.

Control Variables: World Polity Variables

Environmental agreement participation. It has been suggested that nation-states' ratification of environmental treaties is an indicator of world polity and global institutionalization of national environmental protection (Frank et al., 2000; Shandra, 2007). The index most commonly used for such state environmentalism was constructed by Dietz and Kalof (1992) in both weighted and unweighted form. Because of its outdated nature in relation to the dependent variable in this study, measured in 2004, we use a scale constructed by Esty, Levy, Srebotnjak, and de Sherbinin (2005), which is used as a contributing variable to the Environmental Sustainability Index. Their scale of participation in international environmental agreements ranges from 0 to 1 and awards countries points based on their compliance with treaty obligations for all protocol and amendments pertaining to a number of conventions.[6] Because of its high correlation of .875 with the measure by Dietz and Kalof (1992), we conclude that this more up-to-date scale is essentially measuring a similar construct. It is expected that environmental agreement participation will be positively related to protected land area.

Environmental intergovernmental organizations. Another indicator of a nation's connection to the world polity used here is the number of environmental IGOs in which a country has membership out of a possible 100 environmental IGOs. It is also expected that this variable will be a positive predictor of protected land area.

IUCN member organizations. This variable refers to the number of IUCN member organizations each country has per million population. The IUCN, which manages the Protected Areas Program, is an international environmental organization with more than 1,000 governmental and NGO members worldwide. This variable is important to include not only as an indicator of connection to the world polity but also because a nation's memberships in this organization could be influential in facilitating more protected area

designations. It would be expected, then, that this variable will positively predict protected land area.

Results

In Table 2, we present the least squares estimates of protected land area, examining each component of women's status as separate predictors, as well as each individual type of women's political status. We organize Table 2 in the following manner: In every equation, we include gross domestic product per capita, rural population density, level of freedom, a dummy variable for Latin America, tourism receipts, and a different component of women's status. We include women's education status in Equation 1, women's economic status in Equation 2, women's health status in Equation 3, and women's political status in Equation 4. In equations 5 through 7, we examine specific dimensions of women's political status—percentage of women in parliament, the number of years women have had the right to vote, and the percentage of women in ministerial government positions, respectively. We organize Table 2 in this way because Shandra (2007) demonstrates that using cognate but distinct independent variables helps reduce potential problems with multicollinearity while increasing the reliability of the findings. If each independent variable exhibits similar effects on protected land area, then confidence in the generalizability of the findings is enhanced.

Let us now turn to a discussion of the findings pertaining to the various dimensions of women's status. In Equations 1, 2, and 3, we confirm that women's status in terms of education, economic/labor, and health has no predictive relationship to protected land area. This result fails to support the hypothesis based on ecofeminist theory that overall empowerment of women and environmental protection are interconnected processes. However, the political component of women's status is a significant predictor of protected areas, as seen in the results for Equation 4, where the coefficient for women's political empowerment is both positive and significant. This finding is further supported by the positive and significant coefficients for women in parliament (Equation 5) and women in ministerial government (Equation 7). Even though women's voting rights is not significant (Equation 6), it could be that the contribution of the women in parliament and women in ministerial government variables to the political component are strong enough to boost the overall significance because as single predictors (Equations 5 and 7, respectively) they are also significant. The more limited influence of women in ministerial government as compared with women in parliament may be due to the fact that data on this measure were based on states' own definition of national executive. In some cases this includes women holding other ministerial positions such as parliamentary secretaries, who likely do not have decision-making roles.

These results correspond nicely with Norgaard and York's (2005) findings that women contribute a unique voice to nation-state policy making. However, it is important to remember that it remains unclear whether this is best explained by some ecofeminist arguments that women have an inherently special connection to nature or by the socialization of women to have more nurturing, pro-environmental attitudes and behaviors. Also, it should be noted that if women's differing attitudes and behaviors are involved in the mechanism by which women in parliament are associated with protected land area

Table 2
Ordinary Least Squares Coefficients Predicting Protected Land Area

	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6	Equation 7
Index of women's educational status	.045 .046 (0.307)						
Index of women's economic/labor status		.162 .187 (1.071)					
Index of women's health status			.069 .075 (0.400)				
Index of women's political status				.278** .324 (2.754)			
Women in parliament					.220** .302 (2.691)		
Years with right to vote						.005 .105 (0.989)	
Women in ministerial government							.119* .203 (1.853)
GDP per capita	−.013 −.017 (−0.074)	−.045 −.045 (−0.201)	−.130 −.170 (−.720)	−.243* −.320 (−1.948)	−.261* −.343 (−2.064)	−.204 −.268 (−1.585)	−.196 −.257 (−1.547)
Rural population density	.096 .136 (1.056)	.740 0.99 (0.641)	.117 .142 (1.250)	.132 .165 (1.568)	.133 .166 (1.572)	.097 .121 (1.124)	.102 .128 (1.207)
Freedom index	−.065 −.152 (−0.985)	.084 .152 (0.816)	−.093 −.189 (−1.404)	−.092 −.195 (−1.444)	−.118* −.251 (−1.941)	−.146** −.310 (−2.337)	−.113* −.240 (−1.742)
Region: Latin America	.511* .224 (1.769)	.453 .225 (1.474)	.284 .133 (1.294)	.391* .173 (1.795)	.360* .159 (1.644)	.418* .185 (1.844)	.400* .177 (1.792)
Tourism receipts	.035 .090 (.496)	.195* .384 (2.108)	.137* .352 (2.208)	.135** .339 (2.382)	.137** .343 (2.406)	.120* .302 (2.055)	.127* .320 (2.202)
Constant	1.819	.614	2.105	2.939	2.335	2.788	2.326
R^2	.111	.097	.125	.254	.251	.195	.218
Number of cases	69	67	96	90	90	90	90
Mean variance inflation factor (VIF)	1.901	2.152	2.683	1.849	1.806	1.733	1.784
Highest VIF	3.623	3.270	5.652	2.999	3.056	2.957	2.936

Note: The first number listed is the unstandardized coefficient, the second is the standardized coefficient, and the third is the *t* value.
*$p \leq .05$, one-tailed. **$p \leq .01$, one-tailed.

Table 3
Ordinary Least Squares Coefficients Predicting Protected Land Area

	Equation 8	Equation 9	Equation 10	Equation 11	Equation 12	Equation 13	Equation 14	Equation 15	Equation 16
Political component	.282** .330 (2.767)	.282** .329 (2.785)	.282** .329 (2.781)						
Women in parliament				.225** .307 (2.707)	.224** .307 (2.729)	.220** .301 (3.068)			
Women in ministerial government							.119* .203 (1.844)	.125* .214 (1.938)	.117* .200 (1.806)
GDP per capita	−.244* −.321 (−1.946)	−.266* −.350 (−2.077)	−.276* −.363 (−2.049)	−.262* −.345 (−2.065)	−.285* −.374 (−2.196)	−.281* −.370 (−2.075)	−.196 −.257 (−1.539)	−.220* −.290 (−1.700)	−.211 −.277 (−1.545)
Rural population density	.131 .163 (1.545)	.128 .160 (1.513)	.124 .155 (1.454)	.131 .164 (1.549)	.128 .161 (1.517)	.127 .159 (1.477)	.102 .128 (1.192)	.098 .122 (1.150)	.098 .123 (1.135)
Freedom index	−.098 −.208 (−1.488)	−.095 −.203 (−1.492)	−.083 −.177 (−1.275)	−.124* −.265 (−1.973)	−.122* −.259 (−1.995)	−.113* −.241 (−1.819)	−.115* −.244 (−1.700)	−.115* −.246 (−1.776)	−.110* −.234 (−1.668)
Region: Latin America	.403* .179 (1.824)	.427* .189 (1.918)	.370* .164 (1.674)	.372* .165 (1.676)	.396* .175 (1.772)	.346 .153 (1.558)	.403* .179 (1.778)	.439* .194 (1.928)	.390* .173 (1.720)
Tourism receipts	.144** .362 (2.338)	.165** .414 (2.447)	.148** .371 (2.461)	.147** .368 (2.366)	.168** .421 (2.476)	.145** .364 (2.410)	.130* .326 (2.068)	.161** .404 (2.327)	.133* .334 (2.176)
Environmental agreement participation	−.427 −.051 (−0.391)			−.450 −.053 (−0.411)			−.118 −.014 (0.106)		
Environmental IGO memberships		−.103 −.102 (−0.827)			−.105 −.104 (−0.844)			−.114 −.113 (−0.888)	
IUCN member organizations			.243 .074 (0.663)			.159 .048 (0.434)			.115 .035 (0.306)
Constant	3.243	3.298	2.838	2.642	2.691	2.271	2.409	2.686	2.289
R^2	.255	.260	.258	.253	.258	.253	.218	.226	.219
Mean variation inflation factor (VIF)	1.926	1.989	1.903	1.893	1.954	1.856	1.866	1.939	1.839
Highest VIF	3.000	3.178	3.470	3.059	3.211	3.495	2.936	3.187	3.386

*$p \leq .05$, one-tailed. **$p \leq .01$, one-tailed.
Note: $N = 90$; the first number listed is the unstandardized coefficient, the second is the standardized coefficient, and the third is the t value.

status, the effect depends heavily on the degree to which both women's and men's attitudes and behaviors toward the environment are socially constructed and historically changeable.

In Table 3, we present the least squares estimates of protected land area, examining women's political status overall, women in parliament, and women in ministerial government as predictors. We include all the other independent variables from Table 2 in the equations of Table 3, and we also include three different world polity measures in the models. In Equations 8, 11, and 14, we include participation in environmental agreements. Equations 9, 12, and 15 include memberships in environmental IGOs, and in Equations 10, 13, and 16, we include IUCN membership organizations. Independent variables of interest

are once again maintained as distinct indicators in separate models for the same reasons discussed above.

The results presented in Table 3 are similar to those of Table 2. As expected, women in parliament remains highly significant in these models (Equations 11, 12, and 13), as does overall political status (Equations 8, 9, and 10). The "women in ministerial government" variable was also a significant predictor in the three models in which it was included (Equations 14, 15, and 16). However, the effect of the world polity variables on protected land area is contrary to hypotheses—none are significant in any of the models despite theoretical reasons to expect a significant relationship. In particular, we would expect that because the protected areas program is subsumed under the IUCN, the number of IUCN member organizations in a country would be influential in increasing protected land area either through greater exposure to the protected areas program or via IUCN lobbying through its member organizations. In addition, past research has found that particularly in areas such as water pollution, carbon dioxide emissions, and deforestation, connection to a world polity is associated with lower levels of environmental degradation (Schofer & Hironaka, 2005; Shandra, 2007; Shandra, Shor, & London, 2008; Shandra et al., 2004).

Instead, these results suggest that when it comes to environmental protection through protected land area, any influence of connection to a world polity may be overshadowed by women policy makers' involvement in nation-state decision-making processes. There are a number of plausible reasons that might explain why these results concerning the world polity variables contradict hypotheses based on prior research. Not only do the samples in prior work vary considerably from this research in terms of size and countries included, but the time period of the data used also differs by over a decade or more between this study and prior research. In addition, in most cases past work has featured environmental INGOs as the preferred indicator of world polity connection, which was not used here due to unavailable data for the time period of interest.

Level of development had a significant inverse effect in all but two of the final models. However, its influence is opposite the direction found in Bates and Rudel (2000), as well as in Norgaard and York's (2005) model for women in parliament predicting environmental treaty ratification. Perhaps the hypothesis posed by Norgaard and York (2005) is correct that demonstrating concern by signing treaties does not mean that those same countries are environmentally responsible in practice. Here, it appears that countries with a higher GDP per capita are less likely to actually implement protection efforts that might undermine their economic interests, which is more consistent with findings that modernization is associated with negative environmental consequences, not environmental preservation (Ehrhardt-Martinez, 1998; Shandra et al., 2004; York et al., 2003).

Rural population density does not reach significance, but approaches it in many cases. Countries located in Latin America and the Caribbean had significantly higher amounts of protected land area from countries in other parts of the world in all but one of the final models. In addition, it is noteworthy that the level of tourism is highly significant, and in most cases is of stronger influence than women's political status variables and GDP per capita. In line with our hypothesis, higher levels of tourism have a positive impact on protected land area, indicating that nation-states either capitalize on it as a way of being able

to finance protected areas, or the benefits provided by tourism help motivate countries to preserve and protect some land area in order to enhance and ensure future benefits from ecotourism.

Level of freedom in a country is a negative and significant predictor of protected land area in nearly all of the final models. Because decreasing values on the Freedom Index actually represent increasing levels of freedom, these results support previous work suggesting that higher levels of political freedom should lead to more protected land area (Bates & Rudel, 2000; Midlarsky, 1998; Norgaard & York, 2005). On a related note, some authors make the point that local communities may perceive the institution of protected areas as a loss of freedom or an obstacle to obtaining resources they need from those areas for daily economic sustenance (Carey et al., 2000; Carrus et al., 2005). Both sets of authors argue that strong opposition of local communities and their residents pose a major barrier impeding the institution of protected land area, but in this case it does not appear to be problematic. Instead, these results imply that environmental IGO and INGO efforts to influence citizens at the local level to form or maintain pro-environmental social movements, as suggested by Shandra (2007), may be successful in their attempts. The role of social movements, then, may be important to explore in future research examining predictors of protected land area.

Discussion and Conclusion

This study aimed to examine the relationship between women's status and environmental protection efforts, both with regard to status overall and also specifically in the area of political decision making through voting rights and participation in political leadership positions. First, these results do not support the broader ecofeminist notion that overall women's status and environmental degradation are interconnected systems of oppression sharing a common source. If the overall empowerment of women (operationalized to represent four areas of life) and liberating nature from destruction did go hand-in-hand, we would see that improved women's status in *all* of the four areas of women's status would witness an increase in protected land area. Instead, women's status in educational, labor, and health arenas did not have a significant impact on protected land area. It should be noted that this does not mean that one or a few very specific individual variables within the education, labor, and health components would not have an impact on protected land area, as our results regarding the political component show such specificity to be critical. However, theoretical arguments linking generalized women's status and environmental processes do not suggest reasons to investigate such a breakdown of the overall women's status construct. Such an exploration of specific variables is suggested only in the arena of expressing political voice, as evidenced by both empirical work on women's greater pro-environmental attitudes and behaviors and women's involvement in pro-environmental agendas.

In terms of this more particular exploration of the relationship between women's political power and environmental protection, these results support the statement that nations with a higher proportion of women in governmental positions have a greater tendency to create protected land areas, controlling for other factors. This provides empirical support

and additional rationale for the important work that organizations like the United Nations and the Women's Environment and Development Organization are doing to promote women's inclusion in decision-making. The narrower ecofeminist claims about a special bond between women and nature, as well as empirical findings about women's heightened pro-environmental attitudes make a strong case for causal speculation, but that conclusion cannot be made here.

On a related point, it is important to be cautious about the essentialist nature of conclusions which suggest a unified, distinctive "women's voice" (Seager, 1996) or which point to women as being more pro-environmental than men. The social construction of gendered behaviors and their historical malleability must be taken into account and so, too, does the diversity of attitudes and behaviors exhibited by women as a group. In addition, inclusion of women in positions of leadership does not by itself address larger dynamics of male-dominated power. However, at the current moment this study finds evidence that giving political voice to women through positions of leadership in government is associated with positive environmental protection outcomes. Finally, although there is a growing connection of nation-states to a world society, it appears that the individual behavior of nation-states outside of the influence of world polity is still strong when it comes to environmental protection efforts, and examining this behavior in relation to gender is critical.

An important conclusion of the findings of this study is that examining issues in relation to women's status is important, but it is critical to look within the concept as a whole to its constituent components and even to very specific elements of those components. Use of current and developing indices of women's status overall in research may obscure valuable information about very specific social and structural elements which may be influential. As found here in relation to protected areas, for example, results indicate that specifically women's status in roles of decision-making in parliament and ministerial government, is more related to land area protection efforts than women's voting rights, just as strong as a generalized notion of women's political power, and even more strongly associated than women's status overall. In this case, using only an overall index of women's status to explore the relationship between gender inequality and environmental protection would have revealed nothing, masking a significant and more specific slice of women's political status that appears to be influential.

Although this research proves to be an insightful first step in understanding the relationship between women's status and environmental protection, it is limited in a number of ways. To begin, the definitiveness of the link between women in national government and protected land area remains unclear in the absence of other potential contributing factors—the final models explaining the most variance in protected land area only explain 26% of the total variance. The influence of other factors remains largely unaccounted for here, and the relationship between women in governmental leadership and protected land area may become insignificant in the presence of those influences. Identifying other predictors of protected land area as an environmental protection outcome and designing a better specified model seems a critical next step.[7] In fact, this next step could involve examining how the different aspects of women's status affect different types of protected land area. We use an aggregate measure of *all* protected land area within a nation. However, we may not be finding support for three of the four realms of women's status because of our choice

of dependent variables. It may well be that these different dimensions of women's status could be more relevant for explaining why certain types of protected areas are created rather than others. For instance, many women in the Third World may be more concerned with creating extractive reserves rather than completing protecting an area because they are dependent on the land for household tasks (e.g., collecting firewood) and income generating activities (e.g., making handicrafts; Dankelman&Davidson, 1988). Moreover, we employ a macro-comparative methodology to examine the relationship between women's status and protected land area. However, cross-national research cannot describe in detail how political participation may translate into protected land area in specific locations. Therefore, case study analysis of this relationship at the subnational level is essential.

Further research should also explore a potential relationship between women in governmental leadership and measurable outcomes of conservation efforts and policies such as access to clean water and deforestation**.** It is important to recognize that protecting land area in and of itself does not put an end to environmental degradation within those areas and certainly not outside of them. Also, there is still a danger that some protected area designations may go unimplemented or are so poorly implemented that their environmental conservation purpose is not well served (Carey et al., 2000). However, establishing protected land area and managing it well is a valuable step in creating a more sustainable planet.

Appendix A
Variables, Transformations, and Data Sources

Variable and Year	Transformation	Data Source
Dependent variable		
Protected areas: IUCN Categories I to VI and other (% of total land area), 2004	Natural log	World Resources Institute
Women's status variables		
Female to male ratio of average total years in school, 2003	Inverse	World Resources Institute
Gender parity index for gross enrollment ratio, all levels except pre-primary, 2004	Inverse	UNESCO
Ratio of female to male adult (aged 15+ years) literacy rate, 2004	Inverse	World Bank and UNESCO
Ratio of estimated female to male earned income, 2002		United Nations Human Development Report (2004)
Female professional and technical workers (% of total), 2001	Square root	United Nations Human Development Report (2004)
Female labor force (% of total labor force), 2004	Natural log	World Bank
Seats in parliament held by women (% of total), 2003	Square root	United Nations Human Development Report (2003)
Number of years women have had the right to vote, as of 2004		United Nations Human Development Report (2006)
Women in ministerial government (% of total), 2001	Square root	United Nations Human Development Report (2004)

(continued)

Appendix A (continued)

Variable and Year	Transformation	Data Source
Maternal mortality ratio (per 100,000 live births), 2000	Natural log	World Bank
Females living with HIV/AIDS (% of total living with HIV/AIDS), 2003		World Resources Institute
Female infant mortality (deaths per 1,000 live births), 2004	Natural log	U.S. Census Bureau International Database
World polity variables		
Participation in international environmental agreements, 2004	Inverse	Esty et al. (2005)
Number of memberships in 100 environmental IGOs, 2003-2004	Square root	Esty et al. (2005)
IUCN member organizations per million population, 2004	Inverse	Esty et al. (2005)
Other control variables		
GDP per capita, PPP (current international $), 2004	Natural log	World Resources Institute
Rural population density (people per square km), 2002	Natural log	World Bank
Freedom Index, 2003		Freedom House
Region: Latin America and the Caribbean (1 = yes)		United Nations
International tourism receipts, 2004	Natural log	World Resources Institute

Note: IUCN = International Union for Conservation of Nature and Natural Resources; IGO = intergovernmental organization; GDP = gross domestic product; PPP = purchasing power parity.

Appendix B
Descriptive Statistics and Correlation Matrix for Independent and Dependent Variables

	N	Mean	*SD*	Median	Minimum	Maximum
1. Protected land area	203	11.378	12.256	7.000	0.000	72.300
2. Index of women's educational status	94	0.000	1.000	0.249	–3.330	1.621
3. Index of women's economic/labor status	80	0.000	1.000	0.058	–2.369	2.114
4. Index of women's health status	133	0.000	1.000	–0.115	–2.219	1.684
5. Index of women's political status	129	0.000	1.000	–0.038	–3.143	2.859
6. Women in parliament	165	14.141	9.061	11.500	0.000	45.300
7. Years with right to vote	171	55.444	19.613	54.000	0.000	111.000
8. Women in ministerial government	132	15.550	12.020	12.500	0.000	55.000
9. GDP per capita	160	10280.544	11243.195	6054.500	561.000	69961.000
10. Rural population density	181	557.630	1041.666	285.706	3.460	10830.216
11. Freedom Index	191	3.317	1.948	3.000	1.000	7.000
12. International tourism receipts	141	4542.284	11992.859	785.000	2.000	112941.000
13. Environmental agreement participation	224	0.535	0.283	0.580	0.000	1.000
14. Environmental IGO memberships	224	7.286	6.161	6.000	0.000	29.000
15. IUCN member organizations	207	1.635	6.960	0.180	0.000	62.500

Note: Given the transformations used to correct for skewness, for ease of interpretation descriptive statistics are presented in an untransformed format.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Protected land area	1 203														
2. Index of women's educational status	.075 92	1 94													
3. Index of women's economic/labor status	.046 80	.592** 52	1 80												
4. Index of women's health status	−.11 132	.699** 70	−.285* 65	1 133											
5. Index of women's political status	.326** 127	.507** 72	.496** 63	−.560** 104	1 129										
6. Women in parliament	.304** 161	.277** 89	.384** 78	−.335** 128	.831** 129	1 165									
7. Years with right to vote	.263** 166	.283** 90	.436** 78	−.563** 131	.650** 129	.282** 164	1 171								
8. Women in ministerial government	.247** 130	.305** 74	.274* 63	−.325** 104	.797** 129	.510** 129	.294** 131	1 132							
9. GDP per capita	0.12 156	.603** 87	.256* 78	−.876** 122	.497** 122	.339** 152	.354** 155	.333** 122	1 160						
10. Rural population density	−.171* 173	−.227* 89	−.469** 76	.409** 129	−.343** 124	−.266** 160	−.264** 165	−.264** 127	−.352** 153	1 181					
11. Freedom Index	−.213** 181	−.430** 92	−.463** 79	.578** 132	−.476** 129	−.357** 165	−.276** 170	−.392** 132	−.570** 157	.188* 174	1 191				
12. International tourism receipts	.132 139	.216 74	.033 72	−.697** 105	.308** 100	.255** 127	.230** 130	.181 101	.724** 125	−.225** 131	−.375** 133	1 141			
13. Environmental agreement participation	.283** 203	.141 94	.165 80	−.551** 133	.418** 129	.328** 165	.329** 171	.360** 132	.479** 160	−.446** 181	−.394** 191	.476** 141	1 224		
14. Environmental IGO memberships	.189** 203	.056 94	−.039 80	−.355** 133	.282** 129	.232** 165	.138 171	.322** 132	.336** 160	−.411** 181	−0.105 191	.481** 141	.794** 224	1 224	
15. IUCN member organizations	.164* 194	.309** 94	.120 80	−.359** 133	.306** 129	.246** 165	.089 171	.387** 132	.425** 160	−.201** 181	−.409** 188	.166* 141	.367** 207	.229** 207	1 207

Note: The first number listed is the correlation coefficient. The second number listed is the valid number of cases.
*Correlation is significant at the 0.05 level (two-tailed). **Correlation is significant at the 0.01 level (two-tailed).

Notes

1. The following 90 nations were included in all models where a consistent sample was used (all but three): Albania, Algeria, Angola, Argentina, Australia, Austria, Azerbaijan, Bangladesh, Belarus, Botswana, Brazil, Bulgaria, Burundi, Cambodia, Canada, Cape Verde, Chile, China, Colombia, Costa Rica, Croatia, Ecuador, Egypt, El Salvador, Eritrea, Estonia, Ethiopia, Fiji, Finland, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Guatemala, Guinea-Bissau, Honduras, Hungary, Iceland, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Korea, Kuwait, Latvia, Lebanon, Lithuania, Macedonia, Madagascar, Malawi, Mali, Malta, Mauritius, Mexico, Mongolia, Morocco, Namibia, Nepal, Nicaragua, Nigeria, Norway, Panama, Peru, Poland, Portugal, Romania, Seychelles, Slovenia, South Africa, Spain, Swaziland, Sweden, Switzerland, Syrian Arab Republic, Thailand, Togo, Trinidad and Tobago, Tunisia, Uganda, United Kingdom, United States, Uzbekistan.

2. We determined that Venezuela was an overly influential case in the models using a sample of 90 nations and thus excluded it from these analyses.

3. Note that the first variable has no counterpart for males, and the third variable included is not measured relative to males. To some degree, then, this particular index includes a certain element of health in general as opposed to women's health relative to men's.

4. In cases where two years were given for the year women obtained the right to vote, the second of the years was subtracted from 2004 to obtain the number of years of full recognition, rather than partial recognition of the right to vote. Kuwait was the only country in this data set where women obtained the right to vote after 2004. Kuwait was given a value of 0.00 on this variable, rather than coding it as missing.

5. Norgaard and York's (2005) findings suggest that position in the global economy may be influential. Initial analyses used foreign aid received as a percentage of gross national income, but this limited the sample size considerably and eliminated the more industrialized countries, which do not typically receive foreign aid. Including this variable did not have an impact on the overall pattern of results. We also tried using foreign direct investment, which increased sample size somewhat but was not significant overall in the models. Finally, we would like to thank Jeffrey Kentor for providing us with his measure of position in the world system. Including this variable produced dramatic problems with multicollinearity with the gross domestic product variable and was therefore excluded in further analyses. Other measures of position in the world system either did not include enough cases or were not current, so we ultimately decided to exclude this construct in favor of a more parsimonious model and maximizing the number of cases.

6. Conventions included are the following: Convention on the Trade in Endangered Species (CITES), Basel Convention on the Transboundary Movement of Hazardous Waste, United Nations Convention on Biodiversity, Ramsar Convention on Wetlands, United Nations Convention to Combat Desertification, United Nations Framework Convention on Climate Change (UNFCCC), and the Vienna Convention on the Protection of the Ozone Layer.

7. We would like to thank one anonymous reviewer for suggesting that historical processes might be at work in helping explain how a country arrives at a certain amount of protected land area, particularly with regard to women in positions of political leadership. To test this notion, we ran a model that included the percentage of total seats in parliament held by women in 1990. This variable was not even remotely significant. We feel that the measurement of women in ministerial government in 2001 and women in parliament in 2003 accurately captures the temporal process that may be underway in producing a 2004 outcome of protected land area.

References

Bates, D., & Rudel, T. K. (2000). The political ecology of conserving tropical rain forests: A cross-national analysis. *Society & Natural Resources, 13*, 619-634.

Bretherton, C. (1996). Gender and environmental change: Are women the key to safeguarding the planet? In J. Vogler & M. F. Imber (Eds.), *The environment and international relations* (pp. 99-119). New York: Routledge.

Bretherton, C. (2003). Movements, networks, hierarchies: A gender perspective on global environmental governance. *Global Environmental Politics, 3*, 103-119.

Carey, C., Dudley, N., & Stolton, S. (2000). *Squandering paradise: The importance and vulnerability of the world's protected areas*. Gland, Switzerland: World Wide Fund for Nature.

Carrus, G., Bonaiuto, M., & Bonnes, M. (2005). Environmental concern, regional identity, and support for protected areas in Italy. *Environment and Behavior, 37*, 237-257.

Dankelman, I., & Davidson, J. (1988). *Women and the environment in the Third World: Alliance for the future*. London: Earthscan.

Davidson, D. J., & Freudenburg, W. R. (1996). Gender and environmental risk concerns: A review and analysis of available research. *Environment and Behavior, 28*, 302-340.

Dietz, T., & Kalof, L. (1992). Environmentalism among nation-states. *Social Indicators Research, 26*, 353-366.

Dudley, N., & Stolton, S. (2003). *Running pure: The importance of forest protected areas to drinking water.* Gland, Switzerland: World Bank/WWF Alliance for Forest Conservation and Sustainable Use.

Ehrhardt-Martinez, K. (1998). Social determinants of deforestation in developing countries: A cross-national study. *Social Forces, 77*, 567-586.

Esty, D. C., Levy, M., Srebotnjak, T., & de Sherbinin, A. (2005). *2005 Environmental Sustainability Index: Benchmarking national environmental stewardship.* New Haven, CT: Yale Center for Environmental Law and Policy.

Forbes, L. C., & Jermier, J. M. (2002). The institutionalization of bird protection: Mabel Osgood Wright and the early Audubon movement. *Organization & Environment, 15*, 458-465.

Frank, D. J., Hironaka, A., & Schofer, E. (2000). The nation-state and the natural environment over the twentieth century. *American Sociological Review, 65*, 96-116.

Gaard, G. (1998). *Ecological politics: Ecofeminists and the greens*. Philadelphia: Temple University Press.

Hunter, L. M., Hatch, A., & Johnson, A. (2004). Cross-national gender variation in environmental behaviors. *Social Science Quarterly, 85*, 677-694.

International Union for Conservation of Nature and Natural Resources. (2000). *Protected areas: Benefits beyond boundaries.* London: JM Partners/The Yale Press.

Littig, B. (2001). *Feminist perspectives on environment and society*. Harlow, UK: Pearson Education.

Merchant, C. (1980). *The death of nature: Women, ecology, and the scientific revolution*. San Francisco: Harper & Row.

Merchant, C. (1996). *Earthcare: Women and the environment.* New York: Routledge.

Midlarsky, M. (1998). Democracy and the environment: An empirical assessment. *Journal of Peace Research, 35*, 341-361.

Momaya, M. (curator). (2008). *Why women go green: Women make up the majority in the Green Party*. *How do women save the earth? Women, power and politics*. San Francisco: International Museum of Women. Retrieved May 7, 2009, from http://www.imow.org/wpp/stories/viewTopic?topicId=110

Mohai, P. (1997). Gender differences in the perception of most important environmental problems. *Race, Gender & Class, 5*, 153-169.

Norgaard, K., & York, R. (2005). Gender equality and state environmentalism. *Gender & Society, 19*, 506-522.

Polit, D. F. (1996). *Data analysis and statistics for nursing research.* Upper Saddle River, NJ: Prentice Hall.

Rocheleau, D., Thomas-Slayter, B., & Wangari, E. (1996). Gender and environment. In D. Rocheleau, B. Thomas-Slayter, & E. Wangari (Eds.), *Feminist political ecology: Global issues and local experiences* (pp. 3-23). New York: Routledge.

Schofer, E., & Hironaka, A. (2005). The effects of world society on environmental protection outcomes. *Social Forces, 84*, 25-47.

Seager, J. (1993). *Earth follies: Coming to feminist terms with the global environmental crisis*. New York: Routledge.

Seager, J. (1996). "Hysterical Housewives" and other mad women: Grassroots environmental organizing in the United States. In D. Rocheleau, B. Thomas-Slayter, & E. Wangari (Eds.), *Feminist political ecology: Global issues and local experiences* (pp. 271-283). New York: Routledge.

Shandra, J. (2007). The world polity and deforestation: A quantitative, cross-national analysis. *International Journal of Comparative Sociology, 48*, 5-27.

Shandra, J. M., London, B., Whooley, O. P., & Williamson, J. B. (2004). International nongovernmental organizations and carbon dioxide emissions in the developing world: A quantitative, cross-national analysis. *Sociological Inquiry, 74*, 520-545.

Shandra, J. M., Shor, E., & London, B. (2008). Debt, structural adjustment, and organic water pollution: A cross-national analysis. *Organization & Environment, 21*, 38-55.
Szagun, G., & Pavlov, V. I. (1995). Environmental awareness: A comparative study of German and Russian adolescents. *Youth & Society, 27*, 93-112.
United Nations Development Programme. (2004). *Human development report 2004: Cultural liberty in today's diverse world*. New York: Author.
United Nations Environment Programme. (2004). *Women and the environment*. Nairobi, Kenya: Author.
Warren, K. J. (2000). *Ecofeminist philosophy: A Western perspective on what it is and why it matters*. New York: Rowman & Littlefield.
York, R., Rosa, E. A., & Dietz, T. (2003). Footprints on the earth: The environmental consequences of modernity. *American Sociological Review, 68*, 279-300.
Zelezny, L., & Bailey, M. (2006). A call for women to lead a different environmental movement. *Organization & Environment, 19*, 103-109.
Zelezny, L. C., Chua, P.-P., & Aldrich, C. (2000). Elaborating on gender differences in environmentalism. *Journal of Social Issues, 56*, 443-457.

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