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A Roll Call Analysis of the Endangered Species Act Amendments

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ABSTRACT

Public choice economics views legislative process as a transaction in the political market. Interest groups demand regulation in their favor and lobby lawmakers. The lawmakers analyze an assortment of factors and supply legislation to the winning group, thereby maximizing their rent from the political market. This paper examines Endangered Species Act (ESA) amendments from a public choice perspective. Congressional voting on the ESA amendments are assessed using a model based on political incentive. The results show that the lawmakers' voting behavior is correlated with their party affiliation, and several characteristics of their home state, such as number of endangered species, proportion of urban population, contribution of the natural resources and construction sectors in gross state product, and geographical location.

Keywords: Interest group theory, Endangered Species Act, roll call analysis, logit.

INTRODUCTION

The Endangered Species Act (ESA) of 1973 is sometimes called the most powerful environmental regulation in the U.S. (Mann and Plummer 1995). It was designed to protect species from becoming extinct. Under ESA, no person may take any animal species listed as endangered by the United States Fish and Wildlife Service (FWS).[1] The Act's conflict with market-driven economic growth and development has given rise to issues such as the Spotted Owl controversy in the Pacific Northwest and well-known court cases like *TVA v. Hill* (437 U.S. 153 [1978]).

The importance of the ESA is that the number of listed endangered species is large and increasing rapidly and that more than 80 percent of endangered species have some or all of their habitats on private lands (GAO 1995). The law, therefore, has impact on the management of many private and public lands. Some provisions of the Act have been challenged in the U.S. Supreme Court.[2] Thus, the ESA has been at the center of controversy surrounding environmental regulations in the last two decades. ESA-related legislation, passed or proposed, often sparks debates among landowner organizations, environmental groups, and academicians. These debates tend to be polarizing and the arguments made are often political and uncompromising.

However, the voting behavior of lawmakers on ESA-related legislation has not been a subject of empirical study. This paper identifies and analyzes the factors influencing the ESA-related legislation from a public choice perspective, following Stigler (1971), Peltzman (1976), and Becker (1983). More specifically, we try to answer the following questions. What are the political and economic factors that influence the voting behavior of legislators in case of the ESA? Is the voting behavior consistent with public choice theory and existing literature? And, what implications can be drawn from studying the evolution of this powerful environmental legislation? The results may provide important policy

[1] The ESA defines taking as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

[2] An example is *Babbit v. Sweet Home Chap., Coms. for Ore*. (11 S. Ct. 714 [1995]).

implications about the current ESA reauthorization debate and may be generalized for other environmental legislation. This paper begins, in the next section, with a literature review of public choice theory and relevant research. This is followed by a discussion of four major ESA-related amendments analyzed empirically in this paper. Section 3 describes methodology, hypothesis, and data used in this study. The remaining sections present empirical findings and conclusions.

LITERATURE REVIEW

Stigler (1971) and Peltzman (1976) laid out the foundation for analyzing regulation as a means to capture rents by competing interests. According to Stigler, there are two principal theories of regulation. The public interest theory assumes that decisions by legislators (and other public officials) are based on the assumption that these individuals' actions are in the public interest (i.e., maximizing social welfare). Interest group theory (or capture theory, constituent interest theory), on the other hand, assumes that such decisions are based on the availability of rents and the ability of legislators to maximize them with respect to their own self-interest (Stigler 1971; Zusman 1976; Peltzman 1976; Rausser 1982; Becker 1983). Rent seeking is possible because the state has coercive power that can be transferred to market power.

Based on Stigler's theory of regulation, Peltzman (1976) constructed a model for the political market. In his model the regulator seeks to maximize a majority, which is a function of total number of potential voters, number of voters in the beneficiary group, and probabilities that the voters in the beneficiary group will support and those who are taxed will oppose. Peltzman (1976) pointed out that even considering a best-case scenario, public regulation is less efficient than private negotiation from the standpoint of the beneficiaries. In addition, regulators often seek to benefit few while taxing many because they have an incentive to restrict the size of a winning group and to spread the losses rather than the benefits over a large population (Peltzman 1976; Becker 1983).

Becker (1983) modeled the competition among interest groups for political influence. His analysis shows that groups that are relatively efficient at producing political pressure are likely to be the winners. Therefore, the principal contributing factor to the success of a pressure group is not the absolute efficiency of the group itself but the efficiency of the group compared to others. In addition, the size of the deadweight cost arising from the legislation matters in that the bigger the cost, the smaller the size of subsidy to the winners. In other words, more efficient policies have a higher likelihood of being adopted. This is because the winners, and even the losers, are better off if the most efficient method of taxation is employed (Becker 1983).

Both public interest and interest group theories have empirical support, although interest group theory has recently fared better than public interest theory (e.g., Kalt and Zupan 1984; Peltzman 1984; Berg and Tschirhart 1988; Noll 1989; Teske e al. 1994). Sometimes economically efficient choices may coincide with choices in the interest of one or more groups, and there is a need to disentangle economic and political influences. Accordingly, a hybrid theory that allows for the influence of both interest groups and economic efficiency has been proposed (e.g., Joskow 1972; Noll 1989).

These theories have been tested in the utility industry (e.g., Nelson 1982), oil industry (e.g., Becker 1983), transportation (e.g., Teske e al. 1994), agriculture (e.g., Gardner 1983; Gardner 1987; Bullock 1992a, 1992b; Rausser and Foster 1990), and forestry (Kalt 1988; Mehmood and Zhang 1999). Two articles by Ando (1999, 1997) are, to our knowledge, the only interest group analyses of ESA-related issues from public choice perspective.

Although there has been no empirical research on ESA votes, the economic literature contains numerous voting studies. Early works considered legislators either as "delegates," who vote according to voters' wishes, or "trustees," who use their own ideology for voting decisions (Coates and Munger 1995). Recent studies have focused more on the notion of "delegates," claiming that the use of legislators' own ideology is tantamount to "shirking." However, some of these studies have found ideology as a significant factor in voting behavior and concluded that Stigler-Peltzman theory of politics was erroneous

(e.g., Kau and Rubin 1979, 1981; Peltzman 1984; Kalt and Zupan 1984, 1990; Poole and Romer 1993). On the other hand, Coates and Munger (1995) argue that studies on ideology and shirking are often flawed because they are not tied to a model of behavior. Jackson and Kingdon (1992) contend that use of voting indices common in this stream of research tends to overestimate ideology and underestimate the impacts other economic factors. Nevertheless, research on legislator voting behavior continues to grow.

ESA-RELATED AMENDMENTS

Several votes in the U.S. House of Representatives have been directly on issues concerning the ESA since its passage in 1973. These were mostly votes on proposed amendments to the ESA. "Vote" used in this paper means actual roll call votes. House members sometimes engaged in voice votes on the ESA, and since voting by individual members was not recorded in those instances, empirical analysis of those votes is impossible. The same problem is encountered in case of the Senate. Although amendments passed by the House have to be ratified by the Senate, in these cases the passage was achieved by voice votes, making similar analysis impossible.

Table 1 summarizes all House roll call votes on ESA amendments. This list was compiled from various issues of the *Congressional Quarterly Almanac*. Four amendments were chosen for empirical analysis based on their importance and potential impacts on the ESA. Furthermore, in a few cases the opposition to the issue in question was small and resulted in almost all of the members voting in support.[3] Empirical analysis of such a voting will inevitably produce insignificant estimates. The first of the four votes analyzed in this study was on an amendment to exempt the Tellico Dam project from the Act and was taken in 1978. The construction of the dam was stalled because it was feared that the project threatened the Snail Darter (*Percina tanasi*), an endangered fish species. This sparked the very first large battle on the ESA (Mann and Plummer 1995). In *TVA v. Hill* (437 U.S. 153 [1978]), the Supreme Court had held that the project must be stopped. The sponsor of the amendment was John J. Duncan, R-TN, whose district contained the dam. He argued that the project did not threaten the Snail Darter since a

[3] For example, in the initial passage of the ESA only 12 votes are in opposition.

large number of the fish had been transplanted into another river (Congressional Quarterly 1978). The amendment was adopted by a vote of 231-157.

The second vote was a 1987 amendment proposed by Wes Watkins, D-OK, to remove a fish species called Leopard Darter Minnow (*Percina Pantherina*) from the threatened species list. Watkins' district contained the site for the proposed Lukfata Dam and the site was a habitat for the species. Watkins argued that biologists had found the species to be far more abundant than previously thought. Walter B. Jones, D-N.C., opposed the amendment, arguing that there existed an established procedure for removing a species from the list and that it was not wise for the Congress to interfere with it. The amendment was then rejected 136-273 (Congressional Quarterly 1987).

The third vote was also on an amendment proposed in 1987. Solomon P. Ortiz, D-TX, proposed a two-year delay of the use of a device designed to exclude sea turtles by Gulf of Mexico shrimpers. The Gulf shrimpers argued that due to its heavy weight (about 40 lbs.), the device would endanger crewmen and sharply reduce their catch. Estimates of the loss varied from 30 percent of a catch by the shrimpers to less than 5 percent by some environmental groups (Congressional Quarterly 1987). John D. Dingell, D-MI, opposed the amendment, and he indicated that the tuna fishermen raised similar arguments against efforts to protect Porpoises and that their fear of losses never materialized. The amendment was finally rejected by a vote of 147-270 (Congressional Quarterly 1987).

The fourth vote was taken in 1994 and involved both the ESA and property rights. William Tauzin, D-LA, proposed an amendment to ignore the presence of any endangered species or land-use restrictions when appraising private property for the purpose of wilderness designation. The practical significance of the amendment is that the value of private property will increase if the presence of endangered species and land-use restrictions are ignored. It was also important from a philosophical point of view, as it was the first time such a bill was proposed. The proposed amendment sparked debates in the House. In the end, the amendment was passed by a vote of 281-148 (Congressional Quarterly 1994).

HYPOTHESIS AND DATA

This study uses the traditional roll call analysis model and logistic regression techniques to analyze the actual voting of the four ESA-related amendments in the House.[4] The dependent variable VOTE is binary, taking the value of "1" for a vote of "yes." The independent variables include House members' party affiliation (PARTY), state location (REGION), number of endangered species in the members' election district (SPECIES), and the demographic and economic characteristics of the district (URBAN, NATRES, and CONS). PARTY is a dummy variable representing "1" for republicans. REGION is a regional dummy taking the value of "1" in case of southern states.[5] The variable SPECIES represents the number of species listed as "endangered." URBAN contains the percent of urban population, while NATRES and CONS include the percent contribution of natural resources and construction sectors in the gross state products.[6]

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[4] In logistical regression, the probabilities for each outcome are,

$$P(Y_i = 1) = P_i = \frac{e^{X_i\beta}}{1 + e^{X_i\beta}}$$

$$P(Y_i = 0) = 1 - P_i = \frac{1}{1 + e^{X_i\beta}}$$

The likelihood function for the model is,

$$L = \prod_{i=1}^{n} P_i^{y_i} (1 - P_i)^{(1-y_i)}$$

The marginal effects for each independent variable can be calculated as

$$\frac{\delta P_i}{\delta X_i} = P_i(1 - P_i)\beta$$

where, P_i and $(1-P_i)$ are the probabilities that the dependent variable takes the value "1" and "0," respectively, and β is the estimated coefficients.

[5] The southern states include Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

[6] Natural resources sector includes agriculture, fishing, mining, lumber and wood products, and paper products industries.

As legislators are often lobbied by different interest groups, they make their decisions by analyzing the pros and cons in order to maximize returns from voting. Since there are only two major parties in the U.S. (with a minuscule number of independent legislators), party affiliation is important. Republicans are supposedly more conservative on economic issues than Democrats, hence they are expected to support a free market approach and less government intervention in environmental matters. All four votes analyzed are on issues that identify with the "conservative agenda" in American politics. Therefore, the coefficient for PARTY variable was expected to be positive. The voters and the legislators in the southern states are typically more conservative, and the coefficient for the regional variable, REGION, was therefore expected to be positive as well.

The number of endangered species in the home state and other characteristics of the state, such as population distribution, and contribution of the natural resources and construction sectors to the state economy, are also relevant. The more species listed as endangered in a state, the higher the cost for the state to comply with the ESA. Thus, the legislators from a state with many endangered species are more likely to support these amendments. Accordingly, the coefficient for the variable SPECIES was expected to be positive. The coefficient for the variable URBAN is expected to be negative because environmentalists are often urban dwellers who do not have much to lose from restrictive regulations. Industries in the natural resources and construction sectors are the ones most likely to be in conflict with the ESA. The Spotted Owl and Tellico Dam controversies are two good examples of such conflict. Therefore, the coefficients for both NATRES and CONS were expected to be positive. However, conflicts often invite intensive lobbying from the opposition. Therefore, if the environmental interests have more influence on any particular voting through effective lobbying, then NATRES may end up being negative.

Wherever possible, district-level data were used in this study. However, for the Tellico dam exemption model, all data were state level as election district-level data were not available. In case of the leopard darter removal and turtle excluder device models, data for URBAN, NATRES, and CONS were

district-level while those for SPECIES were state-level. In case of the California desert protection model, however, district-level data were used for all four of these variables.

Data for VOTE, PARTY, and REGION were collected from the *Congressional Quarterly Almanac* for the respective years. State-level data for SPECIES were collected from the U.S. Fish and Wildlife Service publication *Endangered and Threatened Wildlife and Plants*, while those for district-level were collected from the web site for Endangered Species Protection Program database.[7] In order to obtain district-level data for NATRES and CONS county data for these two variables were first compiled from the Department of Commerce publication *County Business Patterns*. These county data were then aggregated into election districts according to the make-up of districts described in the census reports for election districts. Urban population data for the election districts were also collected from these census reports. State-level data for URBAN were collected from the Bureau of the Census while those for NATRES and CONS were collected from the U.S. Department of Commerce.

EMPIRICAL FINDINGS

Table 2 lists descriptive statistics for the dependent and independent variables in all four models. None of the independent variables were highly correlated as their correlation coefficients were all smaller than ± 0.45, except that for the variables NATRES and CONS in the Tellico Dam exemption amendment, which was 0.65. Since these two variables were not highly correlated in other amendments, we decided to keep them for consistency.

The results for all four models are presented in Table 3. The log-likelihood ratio tests for each of the models is significant at 1 percent. The second and third columns of Table 3 present the coefficients and the marginal effects of the independent variables in the Tellico Dam exemption amendment. Except for NATRES, all the other variables have expected signs. The coefficient for NATRES is negative, but insignificant. As expected, the variable PARTY and REGION are positive and significant at the 1 percent level, confirming that Republicans and House members from the southern states are more likely to

[7] The address for this web site is: http://www.epa.gov/espp/database.htm.

support intensification of economic development. Southern states have a tradition of resisting increased government control and supporting property rights. Moreover, Tellico Dam is located in the South, and TVA spans across several southern states. This project created many jobs and had large economic impacts across these states. So it is not a surprise that the Tellico Dam amendment received wide support from southern legislators.

As expected, the coefficient for URBAN is negative and significant at the 5 percent level. This means that House members from relatively urban states are more likely to oppose the amendment in order to please their more urban-based voters. The coefficient for CONS is positive and significant at the 5 percent level, implying that House members from a state that has a significant contribution to its economy from the construction sector are more likely to support the amendment. Tellico Dam was a big construction project. The fact that such a project was in jeopardy due to the presence of a species of fish was likely to encourage the legislators from these states to support the amendment.

The number of species in the endangered list variable has the expected sign but is not significant. The vote was taken in 1978, when the endangered species list and was relatively short for most states and was just starting to grow. It is therefore understandable that the number of species listed in each state had not yet become a significant factor at that point. As we shall soon find out, the results changed a few years later.

In the model on the amendment for the removal of Leopard Darter Minnow, all variables except NATRES have expected signs. NATRES is again negative, but not significant. The coefficients for PARTY and REGION are significant at the 1 percent level. These results follow the same reasoning as in the previous model.

Unlike in the previous case, the coefficient for SPECIES is found to be significant in this model at the 1 percent level, indicating that the number of species becomes important. The voting on Leopard Darter removal took place in 1987 and by then the endangered species list had grown much longer for

some states. Thus, it is not surprising that the legislators from these states supported the amendment. The coefficient for URBAN is negative and significant at the 1 percent level, as in the previous case. The contribution of the construction sector variable, CONS, is positive as in the previous case and significant at 10 percent, implying that the construction industry is often in conflict with endangered species. Therefore, representatives from districts with a substantial construction industry are likely to support the removal of a species from the list.

In the model for Turtle excluder device amendment, all variables have the expected signs. The coefficients for PARTY, REGION, SPECIES, and URBAN variables are all significant at the 1 percent level. These results are consistent with the previous model and follow the same reasoning.

In the model for California desert protection amendment, all the variables except CONS and NATRES have the expected signs. The variable CONS has a counter-intuitive negative sign. However, the variable is not significant. The variable NATRES, on the other hand, is negative and significant at 5 percent. As mentioned earlier, in the presence of intense lobbying activities from the environmental interest, this variable could end up with a negative sign. The coefficients for PARTY and SPECIES are significant at the 1 percent level, while those for REGION and URBAN at the 10 percent level. These results are consistent with the previous models and follow the same explanation.

Table 4 compares the predicted and actual outcomes for each of the four models. This measures the performance of the models in predicting the voting behavior. For example, in case of the Tellico dam exemption voting, the model correctly predicts 318 (141+177) of the 430 outcomes, an overall success rate of 74 percent. Comparing the two specific outcomes, the model correctly predicts 72 percent of the "no" votes and 75 percent of the "yes" votes. Similar interpretation applies to the other models. It is evident from the table that leopard darter removal and turtle excluder device models perform very well in predicting "no" votes, while the performance is rather lackluster in predicting the "yes" votes. In case of the California desert protection voting, however, the model performs well in predicting both outcomes.

Figure 1 is a graphical representation of the marginal effects of significant variables in all four models. The marginal effects quantify the impacts of the explanatory variables. For example, one percent increase in Republicans from each state is likely to increase support for the Tellico dam exemption amendment by approximately 31 percent (Figure 1).

CONCLUSIONS

This study uses a roll call analysis to analyze the determinants of legislators' vote on endangered Species Act amendments. The results imply that legislators' votes are influenced by incentives in a predictable manner. Consistent with the theories of public choice, legislators vote on ESA amendments based on the number of potential voters in the group lobbying for the legislation, the amount of transfer to the beneficiaries, and the impact the losers may have. The empirical analysis provides evidence that legislators have incentives to support different interests, based on their ideology and the characteristics of the constituents. The model used in this paper could be applied to other studies on the voting of environmental legislation.

The empirical results show that ideology is one of the most important factors in voting on the ESA. This is evident from the strong significance of the party variable in all four models. The lawmakers' affiliation with a political party is indicative of their support for certain ideology. Their strive to become legislators is representative of their efforts to actively promote these interests. This result is consistent with the stream of research on the impacts of ideology on voting behavior.

The number of species listed as endangered was also found to be a significant factor. This is consistent with Ando (1997). The higher the number of listed species, the higher the cost to protect them. A substantial number of listed species also means an increased risk of restrictive regulations, hence a decrease in property rights. Therefore, the probability of opposing the ESA increases with the number of listed species. Contributions to the GSP by the natural resources and construction sectors represent different interests that could conflict with the ESA. The higher the contribution by these sectors to the GSP, the more important they are in the economy of the district. Therefore, the probability of opposition

to environmental regulation by the legislators from these districts also increases. Finally, urban dwellers are more likely to support environmental legislation such as the ESA, and significant regional differences in attitude toward the ESA are found.

It is clear that economic incentives do matter. Constituents' interests appear to have a significant impact on voting. Therefore, providing more incentive to property owners and changing the perception of ESA as a pure "stick" to these owners can be important in future amendments of the ESA. Recent developments in the ESA appear to be moving toward this direction as the federal government is now leaning toward creating incentives for private landowners to help in endangered species conservation (Zhang 1999). Such policies are likely to gather support from politicians and property owners and may prove to be helpful in conserving endangered species.

Table 1. A summary of House roll call votes on the ESA

Year	Issue	Proposed by	Results
1973	Endangered Species Act passage	Dingell (D-MI)	Passed 390-12
1978	Amendment to exempt Tellico Dam	Duncan (R-TN)	Passed 231-157
1978	Establish a two-step review process for federal projects seeking exemption		Passed 384-12
1987	Removal of Leopard Darter from the endangered species list	Watkins (D-OK)	Rejected 136-273
1987	Delay of Turtle excluder device to be used by Gulf shrimpers	Ortiz (D-TX)	Rejected 147-270
1987	Amendment to allow the Secretary of the Interior to consider the health and safety of humans when deciding whether to proceed with federal projects that affect endangered species and their habitat	Packard (R-CA)	Rejected 151-266
1987	Reauthorization and amendments to provide protections for species awaiting to be listed, endangered or threatened plants on public or private lands, and increase civil and criminal penalties for violation of the law		Passed 399-16
1994	Amendment to require the government to ignore the presence of endangered species when appraising land to be designated wilderness	Tauzin (D-LA)	Passed 281-148

Source: Congressional Quarterly

Table 2. Descriptive statistics for dependent and independent variables

	Tellico Dam exemption		Leopard darter removal		Turtle excluder device		CA desert protection	
Variables	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
VOTE	0.5465	0.4984	0.3164	0.4656	0.3464	0.4764	0.6498	0.4776
PARTY	0.3395	0.4741	0.4088	0.4922	0.4088	0.4922	0.4101	0.4924
REGION	0.2884	0.4535	0.3025	0.4599	0.3025	0.4599	0.3226	0.4680
SPECIES	9.2302	9.1088	13.4434	13.0191	13.4434	13.0191	3.2143	3.7983
URBAN	73.4493	12.8905	73.9603	22.7767	73.9603	22.7767	75.0593	22.0173
NATRES	7.2343	5.6659	0.2884	0.6546	0.2884	0.6546	0.2241	0.4946
CONS	4.6984	1.2881	0.7562	1.0051	0.7562	1.0051	0.6667	0.9480
No. obs	430		433		433		434	

Table 3. Logit estimates for the four congressional voting models.

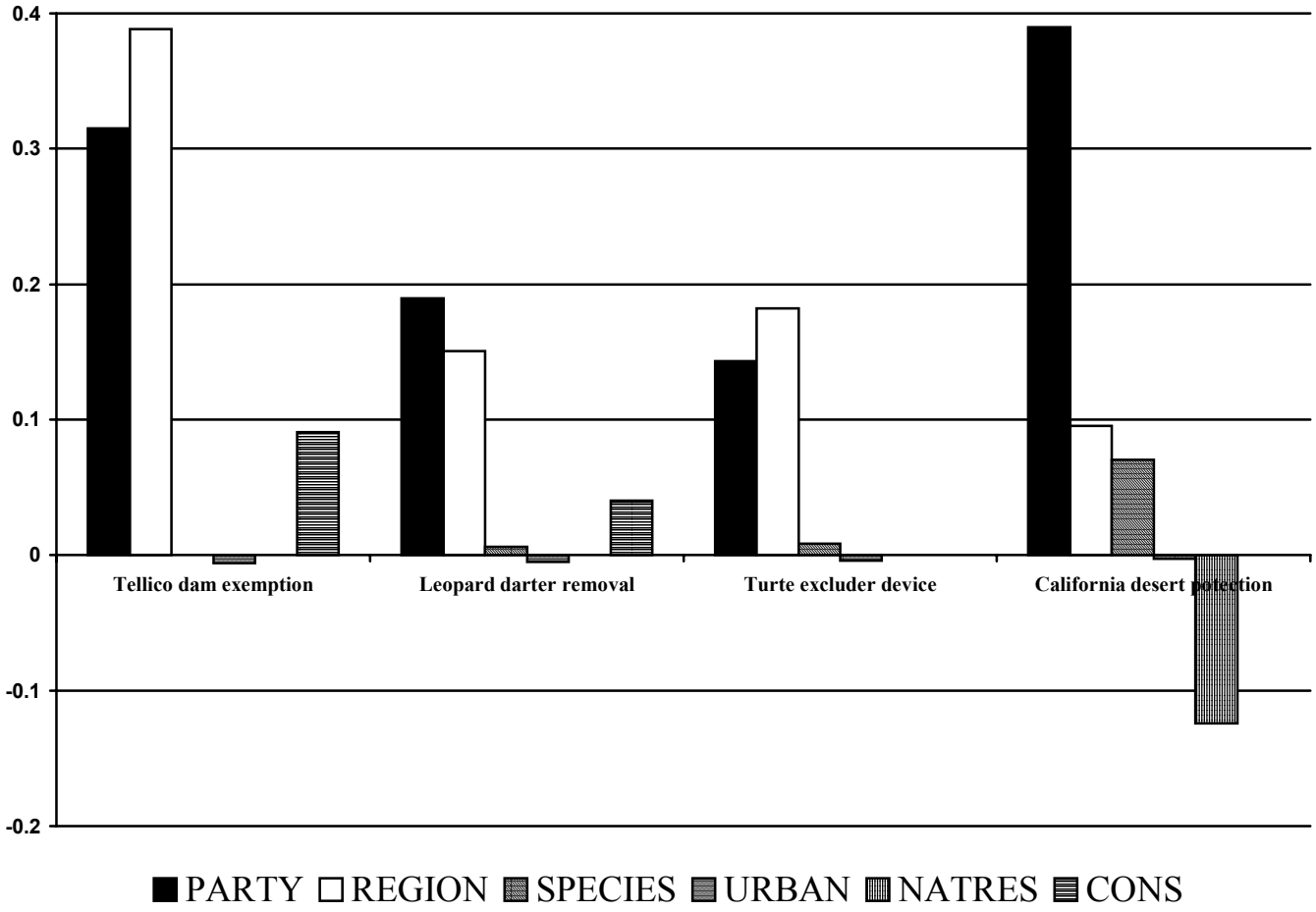
Variables	Tellico dam exemption model		Leopard darter removal model		Turtle excluder device model		Calif. desert protection model	
	Coefficient (t-value)	Marginal effects (St. error)	Coefficient (t-value)	Marginal effects (St. error)	Coefficient (t-value)	Marginal effects (St. error)	Coefficient (t-value)	Marginal effects (St. error)
Constant	0.2633		-0.1975		-0.2205		0.3823	
	(0.2300)		(-0.4280)		(-0.3010)		(0.4600)	
PARTY	1.2841***	0.3149	0.9309***	0.1896	0.6580***	0.1432	2.3348***	0.3899
	(5.2230)	(0.0602)	(4.0360)	(0.0463)	(2.8780)	(0.0494)	(7.4400)	(0.0557)
REGION	1.5841***	0.3885	0.7401***	0.1508	0.8361***	0.1820	0.5715*	0.0955
	(4.7750)	(0.0807)	(2.9500)	(0.0510)	(3.4040)	(0.0534)	(1.8780)	(0.0510)
SPECIES	0.0028	0.0007	0.0299***	0.0061	0.0396***	0.0086	0.4221***	0.0705
	(0.1850)	(0.0037)	(3.1340)	(0.0019)	(4.3100)	(0.0020)	(4.3290)	(0.0134)
URBAN	-0.0246**	-0.0060	-0.0248***	-0.0051	-0.0189***	-0.0041	-0.0168*	-0.0028
	(-1.9680)	(0.0031)	(-4.3210)	(0.0011)	(-3.3690)	(0.0012)	(-1.8830)	(0.0016)
NATRES	-0.0134	-0.0033	-0.1470	-0.0299	0.0676	0.0147	-0.7444**	-0.1243
	(-0.4010)	(0.0082)	(-0.7610)	(0.0393)	(0.0365)	(0.0403)	(-2.0570)	(0.0616)
CONS	0.3705**	0.0909	0.1977*	0.0403	0.1103	0.0240	-0.2072	-0.0346
	(2.4130)	(0.0377)	(1.6450)	(0.0244)	(0.9260)	(0.0259)	(-0.9350)	(0.0363)
Log-likelihood	-238.6373		-236.6191		-246.0780		-180.8927	
Restrict. Log-likelihood	-296.1901		-270.2457		-279.3727		-281.0537	
Chi-squared value	115.1056***		67.2531***		66.5894***		200.3220***	

*** = Significant at 1 percent
** = Significant at 5 percent
* = Significant at 10 percent

Table 4. Predicted versus actual outcomes for the four congressional voting models.

		Tellico dam exemption model		
		Predicted outcomes		
Actual	0	1	Total	% Correct
0	141	54	195	72
1	58	177	235	75
Total	199	231	430	
		Leopard darter removal model		
		Predicted outcomes		
Actual	0	1	Total	% Correct
0	272	24	296	92
1	87	50	137	36
Total	359	74	433	
		Turtle excluder devices model		
		Predicted outcomes		
Actual	0	1	Total	% Correct
0	242	41	283	86
1	89	61	150	41
Total	331	102	433	
		California desert protection model		
		Predicted outcomes		
Actual	0	1	Total	% Correct
0	115	37	152	76
1	44	238	282	84
Total	159	275	434	

Figure 1. Graphical representation of marginal effects of significant variables.



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