An Agricultural Law Research Article

Timber Dependency and Wilderness Selection: The U.S. Forest Service, Congress, and the RARE II Decisions

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Originally published in NATURAL RESOURCES JOURNAL
31 NAT. RESOURCES J. 715 (1991)

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ABSTRACT

Historically, the preservation of wilderness in national parks and U.S. Forest Service wilderness areas has been much more extensive in western Washington than western Oregon despite the similarities of the two areas. The central purpose of this article is to assess whether the higher level of economic dependency on timber in Oregon relative to Washington has played a role in the preservation of wilderness. Recent congressional decisions on wilderness preservation have followed an extensive review of roadless areas by the U.S. Forest Service and recommendations for allocation of such areas to wilderness. This process provides an opportunity to investigate the determinants of wilderness selection and compare recommendations by the Forest Service with final wilderness preservation decisions by Congress. A central conclusion of this research is that Congress allocated fewer acres to wilderness in western Oregon than western Washington because Oregon has a more highly timber dependent economy. In addition, Congress was more sensitive than the Forest Service to timber dependency differences between the two states in its wilderness selection process as well as to the interests of wilderness advocates. The total amount of roadless area acreage allocated to wilderness by Congress was greater than the amount recommended by the Forest Service.

The extent of wilderness preservation in national parks and wilderness areas is much greater in western Washington than western Oregon even though the two areas are comparable vegetationally and geographically. Why? The most apparent economic difference between the two areas is that western Oregon has a higher relative economic dependence on forest products and timber harvesting than western Washington.[1] Has the relative degree of economic dependency on timber influenced land use decisions in the two areas? The second Roadless Area Review (RARE II) process

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**I would like to thank an anonymous referee for insightful comments, and Marquette University for a sabbatical during which the research for this article was initiated.

1. See discussion in the text below for verification of differences in wilderness preservation and timber dependency between western Oregon and western Washington.

undertaken by the U.S. Forest Service during the period 1977 to 1979, culminating in recommendations to Congress for the selection of roadless areas as wilderness, along with the subsequent selection of wilderness areas by Congress in the Oregon and Washington Wilderness Acts of 1984, provide the information necessary to investigate the role of timber dependency as well as other factors influencing wilderness selection.[2] The RARE II process and the subsequent congressional selection of wilderness also provide a unique opportunity to compare the behavior of Congress in land use decisions to the behavior of a major governmental agency, the U.S. Forest Service. Was the response of the U.S. Forest Service (in wilderness selection) to the relative economic dependency of two different regions different from or similar to the response of Congress and why?

The answer to this question is not only of historical interest, but will provide insight into the relative validity of different behavioral hypotheses for the Forest Service and Congress. In a recent article, Paul Mohai uses RARE II data to evaluate whether Forest Service behavior is determined by its professional value orientation or by a desire to avoid political conflict.[3] An alternative behaviorial hypothesis not discussed by Mohai is that the Forest Service has as its primary objective the maximization of its budget.[4] If the professional value orientation of the Forest Service is to follow the principles of maximum sustained yield, then timber dependency should not matter in wilderness selection, other things being equal. The same can be hypothesized for budget maximization. However, if the Forest Service is an arbitrator between political interests and desires to avoid political conflict, then relative timber dependency is likely to play a role in its wilderness selection decisionmaking.[5] Because Congress tends to be highly sensitive to political interests, it is even more likely than the Forest Service to take on the role of a political arbitrator, and a reasonable hypothesis is that timber dependency will play an important role in its wilderness selection process.[6] Members of Congress will prob-

2. Forest Service, U.S. Dept. of Agric., Pub. No. A 13.92: R 53/2, RARE II Final Environmental Statement (1979) [hereinafter RARE II]; Oregon Wilderness Act of 1984, 16 U.S.C. § 1132 (1988); Washington State Wilderness Act of 1984, 16 U.S.C. § 1132 (1988).

3. Mohai, *Public Participation and Natural Resource Decision-Making: The Case of the RARE II Decisions*, 27 Nat. Res. J. 123-155 (1987).

4. The budget maximization hypothesis was first articulated in W. Niskanen, Bureaucracy and Representative Government (1971). For applications of the hypothesis to the U.S. Forest Service, see R. O'Toole, Reforming the Forest Service (1988) and Johnson, *U.S. Forest Service Policy and Its Budget*, in Forestlands: Public and Private 103-134 (R. Deacon & M. Johnson eds. 1985) [hereinafter Johnson].

5. The value orientation hypothesis is fully developed in B. Twight, Organizational Values and Political Power: The Forest Service Versus the Olympic National Park (1983). The political conflict avoidance hypothesis is presented in P. Culhane, Public Lands Politics: Interest Group Influence on the Forest Service and the Bureau of Land Management (1981).

6. For one of the original theoretical works on the role of interest groups in politics, see A. Downs, An Economic Theory of Democracy (1957).

ably be more sensitive to the interest of a particular industry the greater the relative importance of that industry in the local economy. Before evaluating these hypotheses, it is necessary to more fully consider various views on the behavior of the U.S. Forest Service and Congress in land use decisionmaking processes.

FOREST SERVICE BEHAVIOR AND CONGRESS

The actions of the U.S. Forest Service in the wilderness selection process will depend in part on its more general organizational goals. The amount and type of lands in the national forests that the Forest Service is willing to allocate to wilderness will depend on whether its goal is to sustain a fundamental organizational value commitment, to arbitrate compromises between contending interest groups to reduce conflict levels, or to maximize the size of its budget and the scope of its authority. Whether any one or some combination of these behavior goals prevails in the case of the Forest Service is a matter of debate. The first step here will be to briefly summarize the three contending views of Forest Service behavior. Once this is accomplished, we will then be able to address the issue of the relationship between the U.S. Forest Service and Congress.

The Forest Service's professed value commitments were founded historically on the notion that private sector timber harvesting practices would ultimately lead to a "timber famine" preventable only by adopting the principles of sustained yield forestry on national forest lands under the management of a scientifically trained professional elite. Gifford Pinchot, the principle promoter and founding head of the Forest Service, was trained in European forest management principles and imparted the values of sustained yield foresty to the agency. The specific goals the Forest Service derived from the Pinchot tradition are to manage the national forests for the purpose of producing a steady flow of wood fiber for the consuming public, to maintain a stable wood products industry, and to promote the stability of local communities economically dependent on wood products.[7] This value orientation is sustained by a variety of internal mechanisms, according to Ben Twight, as well as by recruitment of personnel from forestry schools that internalize the Forest Service's value commitment.[8] Twight argues further that the Forest Service is willing to sacrifice portions of its jurisdictional domain rather than give up its value commitment when necessary and that it is largely insulated from the external influence of interest groups that have values and goals counter to its own.[9]

An alternative view is that in order to sustain political support for its

7. Nelson, *Mythology Instead of Analysis: The Story of Public Forest Management*, in Forestlands: Public and Private, *supra* note 4, at 23-76.

8. B. Twight, *supra* note 5, at 16-21.

9. *Id.* at 107-116; Mohai, *supra* note 3, at 125-130.

activities the Forest Service is responsive to client group interests.[10] In the absence of contending interests over the use of national forest resources, the Forest Service would be essentially a client of the wood products industry. However, because of growing conflict between wilderness preservationists and wood products industry groups, the Forest Service has become a political arbitrator, forging compromises over land use policy between conflicting groups.[11] The Forest Service has thus avoided capture by any particular interest group and can play one off against another to limit the influence of any individual group.[12]

A third view is that the Forest Service behaves in a manner that will result in the maximization of the size of its budget. It will allocate lands and carry out timber harvesting decisions in such a way as to bring the largest possible budget. Proponents of this view argue that policies such as timber harvesting on the basis of sustained yield can be explained as the result of budget maximization. Under the principle of sustained yield forestry, timber harvesting can only be increased by increasing the overall productivity of a forest through improved siliviculture practices that require added budgetary expenditures.[13] The Forest Service would thus be in a position where it could trade increases in the allowable timber harvest based on sustained yield for increases in its budget. Sustained yield principles are therefore consistent with the pursuit of higher budgets. Advocates of the budget maximization hypothesis also argue that increasing recent attention to recreation needs in the national forests can be explained by a desire for larger budgets.[14]

Whether the different views of Forest Service behavior are necessarily distinguishable in practice is open to question. If allowable harvests based on sustained yield indeed serve to both maximize the budget and maintain the principle of sustained yield, then the two approaches are not really distinguishable in terms of actual behavior. The same is true for conflict minimizing behavior versus budget maximization. In order to maximize the Forest Service budget, wilderness advocates may have to be appeased to prevent them from attacking the budget in Congress.

The Forest Service ultimately must gain the approval of Congress for the policies it carries out, although it is clearly not powerless in its dealings with Congress. Oversight committees for a government agency such as the Forest Service will often be dominated by members of Congress whose constituents are served by the agency and will therefore favor higher agency outputs, such as timber sales that create employment in a local

10. Mohai, *supra* note 3, at 130-133; P. Culhane, *supra* note 5, at 321-341.
11. *Id.*
12. *Id.*
13. Johnson, *supra* note 4, at 123-132; R. O'Toole, *supra* note 4, at 144.
14. Johnson, *supra* note 4, at 115-123.

wood products industry.[15] Thus the interests of the Forest Service and members of Congress in key decisionmaking positions may coincide. If employment is the central consideration and oversight committees play a dominant role in the decisionmaking process, the Forest Service and Congress could well agree with limiting wilderness designation and opening up as many roadless areas as possible to commodity development. If, however, wilderness advocates constitute a significant political force, Congress could be pulled in the direction of selecting more wilderness areas than the Forest Service given that the Forest Service is motivated primarily by its value commitment to sustained yield forestry or budget maximization through timber production and sales activities. Wilderness adds little to the recreation component of the Forest Service budget and could reduce those portions of its budget related to timber production and sales. Thus congressional oversight committees themselves may become arbitrators between political interests and seek a wilderness allocation which brings committee members the greatest re-election prospects. Only if the Forest Service is also a political arbitrator would one now expect the desires of Congress and the desires of the Forest Service for wilderness to coincide. Finally, congressional decisionmakers may well be more sensitive to political and economic differences between states in wilderness selection than the Forest Service if the overriding goal of the Forest Service is either a value orientation to sustained yield forestry or maximization of its budget. If, for example, the timber industry was relatively more important in one state than another, local members of Congress may be more concerned about a given loss of employment in the more highly timber dependent state.

RARE II AND WILDERNESS SELECTION

The empirical analysis of wilderness selection will proceed in two stages. In the first stage, the selection of roadless areas in western Oregon and Washington by the Forest Service in the RARE II process will be evaluated. Western Oregon and Washington were selected for analysis because of their similar geographic characteristics, similar amounts of timber resources and national forest lands, and similar amounts of roadless areas, but different degrees of dependency on forest products industries for employment. The key issue to be addressed is whether the Forest Service allocated relatively less roadless areas to wilderness in western Oregon than western Washington, controlling for variations in wilderness area characteristics and political inputs into the wilderness selection process. The roadless areas sample includes all the roadless areas in the

15. *Id.* at 105-114. For empirical evidence on this point, see Cowart, *Representation of High Demand Constituencies on Review Committees: A Research Note*, 37 Pub. Ch. 337-342 (1981).

national forests located in western Washington and Oregon, or what is often referred to as the Douglas-fir Region.[16] The national forests in the Douglas-fir Region are the Mt. Baker-Snoqualmie, Olympic, and Gifford Pinchot for western Washington and the Mt. Hood, Willamette, Siuslaw, Siskiyou, Umpqua, and Rogue River for western Oregon. Confining the analysis to western Oregon and Washington adds another measure of control for differences because of the geographic and vegetative similarities of the two areas. The drier eastern portions of the two states are excluded from the analysis because of the lesser importance of timber as an economic resource in those areas and because a central issue in wilderness selection in the western portions of the states, the preservation of valley bottom old-growth timber, does not extend to the eastern portions.[17] The forested portions of northern California are excluded because they constitute such a small portion of the total area of the state and are thus not really comparable in relative extent to those of western Oregon and Washington.[18]

In the second stage of the analysis, the final selection of wilderness areas by Congress for western Oregon and Washington will be addressed. The central questions to be considered here are whether the proportion of the original roadless areas allocated to wilderness by Congress differed extensively from the proportion recommended for wilderness by the Forest Service and whether the proportion allocated to wilderness by Congress differed extensively between the two states controlling for variations in wilderness area characteristics and variations in political inputs into the wilderness selection decisionmaking process. The final step will be to present arguments supporting the contention that a higher level of wilderness preservation in western Washington relative to western Oregon can be explained by the lower degree of economic dependency on timber in Washington relative to Oregon.

The RARE II process was initiated partly as a result of dissatisfaction by wilderness advocates with an earlier roadless area review by the Forest Service, manifested in a law suit[19] that prevented use of this review as an environmental impact statement, and a desire on the part of commodity interests to free up roadless areas not designated as wilderness for commodity production.[20] The goal of the process was to identify roadless areas best suited for wilderness and nonwilderness designations.[21] The

16. RARE II, *supra* note 2, at O-2 to O-19, S-2 to S-15.

17. J. Franklin and C. Dyrness, Natural Vegetation of Oregon and Washington, USDA Forest Service, GTR PNW-8 5-43 (1973); USDA Forest Service, Forest Statistics of the U.S. 2 (1977) [hereinafter Forest Statistics]; M. Frome, Battle for the Wilderness 154-155 (1974).

18. Forest Statistics, *supra* note 17, at 2.

19. Sierra Club v. Butz, 349 F. Supp. 934 (N.D. Cal. 1972).

20. Mohai, *supra* note 3, at 137-139; D. Roth, The Wilderness Movement and the National Forests: 1964-1980, USDA Forest Service, FS 391, 49-61 (1984).

21. *Id.*

process involved the gathering of data on the resource potential and wilderness characteristics of roadless areas as well as public input on whether particular roadless areas should be designated wilderness or nonwilderness or placed in a further planning category. A complex ten step procedure was then undertaken to determine the allocation of each roadless area.[22] Areas allocated to wilderness would be recommended for inclusion in the national wilderness system, areas allocated to nonwilderness would be opened up for any type of use permitted in national forests, and a further planning designation would set the area aside for further study. The ten step process appeared to give priority, in the following order, to (1) renewable resource potential (timber, grazing, dispersed motorized recreation, and dispersed nonmotorized recreation), (2) nonrenewable resource potential, (3) wilderness quality, and (4) public preference.[23]

The specific data used and their mean values for the different designations are presented in Table 1, with only those variables that are relevant for western Oregon and Washington included.[24] Nonrenewable resource potential, for example, is not considered because of its lack of importance in the area. The Development Opportunity Rating System (DORS) is essentially an index of a benefit-cost ratio for renewable nonwilderness resources ranging from 0 to 15 with benefits set equal to costs at the number 5.[25] For western Washington and Oregon, this ratio would be predominantly based on timber production and motorized and nonmotorized recreation since other renewable resources are relatively unimportant. Because of the relatively large amounts of harvestable timber in roadless areas,[26] timber production likely played a dominant role in the determination of the DORS rating. The recreation variables are measured in terms of thousands of recreation visitor days, while the programmed harvest is measured in terms of millions of board feet of timber per year.[27] This is the amount the Forest Service would put up for sale annually on average if the roadless area were included in the timber production base. The Wilderness Attributes Rating System (WARS) is an index of wilderness quality ranging from 4 to 28 with 28 being the highest rating, and is based on four factors including naturalness, apparent naturalness, opportunity for solitude, and opportunity for a primitive recreation experience.[28] In quantifying public input, the Forest Service simply counted

22. RARE II, *supra* note 2, at 5-35; Mohai, *supra* note 3, at 139-140.
23. *Id.*
24. RARE II, *supra* note 2, at O-2 to O-19, S-2 to S-15, U-1 to U-40.
25. *Id.* at W-1 to W-5.
26. *Id.* at O-2 to O-19, S-2 to S-19.
27. *Id.* at 14-15. The variable potential yield was excluded from consideration here because it is highly correlated with programmed harvest. For western Washington, the simple correlation coefficient between the two variables is .79, and for western Oregon it is .92.
28. *Id.* at 21.

TABLE 1
Roadless Area Data for Western Oregon: Average Values by Designation

Variable	Wilderness	Nonwilderness	Further Planning	Total
Development Opportunity Rating System (DORS)	8.29	12.18	7.00	11.35
Dispersed Nonmotorized Recreation (DNR)	6.93	4.50	6.03	4.96
Dispersed Motorized Recreation (DMR)	.18	1.70	.03	1.39
Programmed Harvest (PH)	2.86	3.76	1.40	3.53
Wilderness Attribute Rating System (WARS)	19.00	18.27	21.00	18.49
Wilderness Signatures (WS)	2,658	2,030	1,992	2,133
Wilderness With Adjustments Signatures (WSA)	5	3	4	3
Further Planning Signatures (FPS)	13	621	864	529
Further Planning With Adjustments Signatures (FPAS)	0.4	0.3	0.3	0.3
Nonwilderness Signatures (NWS)	8,033	8,118	6,289	8,035
Total Roadless Areas	14	67	3	84
Total Acres	195,524	1,026,105	64,836	1,286,465

the number of signatures on letters and cards expressing the desire for a certain designation for specific roadless areas.[29] The total acreage in roadless areas and the total roadless area assigned as wilderness in western Oregon and western Washington are very close in magnitude, as are the DORS ratings, the amount of nonmotorized recreation, and programmed harvests. The average WARS rating is somewhat higher in western Washington than western Oregon, and the RARE II process generated much more public comment in western Oregon than in western Washington.

What variables actually influenced the allocation of roadless areas to the three categories and why? If the Forest Service is predominantly interested in preserving its value orientation, then the programmed harvest variable should be an important determinant of designation, negatively for wilderness selection, and positively for nonwilderness. If instead the

29. *Id.* at U-1 to U-40.

TABLE 2
Roadless Area Data for Western Washington: Average Values by Designation

Variable	Wilderness	Nonwilderness	Further Planning	Total
Development Opportunity Rating System (DORS)	7.50	11.90	9.90	10.80
Dispersed Nonmotorized Recreation (DNR)	7.38	3.45	7.43	4.83
Dispersed Motorized Recreation (DMR)	.15	.23	.55	.28
Programmed Harvest (PH)	3.47	4.29	3.16	3.95
Wilderness Attribute Rating System (WARS)	24.40	20.56	22.82	21.62
Wilderness Signatures (WS)	1,181	735	1,029	864
Wilderness With Adjustments Signatures (WSA)	640	344	409	405
Further Planning Signatures (FPS)	43	100	44	80
Further Planning With Adjustments Signatures (FPAS)	2	1	1	1
Nonwilderness Signatures (NWS)	2,608	2,835	2,616	2,757
Total Roadless Areas	10	39	11	60
Total Acres	209,950	802,854	200,090	1,212,894

Forest Service is primarily interested in generating a compromise solution between wilderness preservationists and commodity interests, then the public input variables should be important. The WARS rating could also reflect the interests of wilderness advocates as could the DORS rating for commodity interests. An alternative interpretation of the DORS rating is that a higher level likely represents higher potential timber sales values that would lead to higher Forest Service budget levels. The Knutson-Vandenberg Act of 1930 authorizes the Forest Service to keep a share of timber sale receipts to spend on reforestation, and sales receipts are likely to be correlated with benefit-cost ratios since timber companies that bid for timber will be willing to pay more for timber with higher benefit-cost ratios.[30] This assumes that harvesting and transportation costs paid by the bidder are roughly proportional to the sales preparation and roadbuilding

30. R. O'Toole, *supra* note 4, at 112.

costs borne by the Forest Service. Given that all costs are roughly a positive function of elevation, this is probably a fairly reasonable assumption.

Because the dependent variable is categorical rather than continuous in the wilderness selection process, conventional regression analysis cannot be used to analyze the impact of independent variables. However, a multinomial logit procedure can be used that yields results quite similar to regression analysis where the dependent variable is categorical and the independent variables are assumed to be normally distributed.[31] The three possible categories that constitute the dependent variable are wilderness (W), nonwilderness (NW), and further planning (FP). Because the coefficients for one of the categories are normalized to zero, multinomial logit generates two regression equations when there are three possible categories. The further planning category was chosen for normalization, so the equations presented in Table 3 represent the determinants of wilderness and nonwilderness given allocations to further planning. The regression equations estimate the probability of assignment p_i to wilderness for $i=1$ and nonwilderness for $i=2$. Multinomial logit estimates the following equations using maximum likelihood procedures:

$$(1)\quad p_i = e^{b_i'x}/(1+e^{b_1'x}+e^{b_2'x}),$$

where $i=1,2$, b_i' is a vector of regression coefficients, and x is a vector of independent variables.

The logit results are presented in Tables 3-5 for the Washington and Oregon samples separately and for the two samples combined. The dispersed motorized recreation variable (DMR) could not be included in the final Oregon model (Model 3) because doing so would cause a singular Hessian in the maximum likelihood iterative process. This is probably the case because many of the observations for this variable are either zero or a very small number for western Oregon roadless areas. Because the instability of t-statistics and coefficients as variables were added to the models for western Oregon and Washington, three sets of results are reported for Oregon and three for Washington. When further planning signatures (FPS) are added to Model 1 for Oregon in Table 3 to form Model 2, the coefficient on wilderness signatures (WS) is changed substantially and is rendered insignificant, suggesting the presence of multicollinearity. The correlation coefficient for WS and FPS is a relatively high $-.85$. A similar phenomenon occurs between the wilderness attributes rating system variable (WARS) and the wilderness signatures

31. In a similar analysis, Mohai, *supra* note 3, at 143-152 uses discriminant analysis. An alternative statistical procedure is multinomial logit analysis which has the advantage of yielding results that are similar to regression analysis. *See* G. Madala, Limited-Dependent and Qualitative Variables in Econometrics 13-41 (1983).

TABLE 3
Multinomial Logit Results for the RARE II Wilderness Selection Process: Western Oregon

Independent Variables	Model 1		Model 2		Model 3	
	W	NW	W	NW	W	NW
Constant	29.2888*	31.8204*	31.3741	33.1212	57.7628	58.8741
	(1.67)	(1.82)	(1.53)	(1.62)	(1.21)	(1.23)
DORS	.2134	.4165**	.2223	.4093**	.2302	.3987*
	(1.05)	(2.09)	(1.10)	(2.07)	(1.04)	(1.86)
PH	.3873	.4223	.3527	.3987	.8219	.9026
	(1.18)	(1.30)	(0.91)	(1.03)	(0.89)	(0.98)
DNR	−.0825	−.0829	−.0750	−.0774	−.0149	−.1436
	(−0.94)	(−0.96)	(−0.86)	(−0.90)	(−1.01)	(−0.98)
DMR						
WARS	−1.6986*	−1.7975*	−1.5733*	−1.6853*	−2.9523	−3.2086
	(−1.80)	(−1.91)	(−1.70)	(−1.83)	(−1.23)	(−1.27)
WS	.0027*	.0022	.0009	.0008	.0025	.0026
	(1.77)	(1.51)	(0.17)	(0.16)	(0.34)	(0.35)
WSA					−.3190	−.4327
					(−0.61)	(−0.83)
FPS			−.0033	−.0013	−.0037	−.0015
			(−0.52)	(−0.26)	(−0.47)	(−0.23)
FPAS					3.0193	3.1292
					(0.77)	(0.80)
NWS	−.0002	−.0002	−.0001	−.0001	−.0002	−.0003
	(−0.53)	(−0.62)	(−0.37)	(−0.46)	(−0.54)	(−0.57)
Statistics						
Chi-square	25.60		27.61		29.99	
Significance	.0122		.0160		.0375	
Pseudo-R^2	.25		.27		.29	

Note: A ** indicates significance at the 5% level for a two-tailed test; * indicates significance at the 10% level for a two-tailed test. W refers to wilderness, and NW refers to nonwilderness.

adjusted variable (WSA). The latter are signatures in favor of wilderness areas with some boundary adjustments undertaken. The correlation coefficient for WARS and WSA is .45. Since the correlations between WS and FPS and WARS and WSA are probably circumstantial, it is reasonable to conclude that WARS and WS are significant determinants of assignment to wilderness and WARS is a significant determinant of assignment to nonwilderness. Consequently, Model 1 is used for analysis of the statistical significance of variables in Table 3 rather than Model 3 with all variables included.

The negative sign on the WARS variable in Model 1 for western Oregon nonwilderness assignment (NW) is expected, but the negative sign on the WARS variable for a wilderness assignment (W) is at first puzzling.

This suggests that the forest service avoided assigning roadless areas to wilderness that had high WARS ratings. However, when the elasticity of the probability of wilderness assignment with respect to the WARS variable is calculated at sample mean values using equation (1) above, thus taking into account changes in both the numerator and denominator of the probability equation, the result is 1.09, a positive number. Consequently, when the full model with both sets of regression coefficients is considered simultaneously, the negative coefficient is offset by other factors in the first derivative of p_1, and WARS has a positive effect on wilderness assignment. A similar calculation for the probability of assignment to nonwilderness yields an elasticity of $-.21$ for the WARS variable. This suggests that the Forest Service avoided assigning roadless areas to nonwilderness that had high WARS ratings. The mean value of the WARS variable in Table 1 is indeed higher for wilderness assignment than it is for nonwilderness assignment, although the difference is not large.

The Forest Service apparently responded positively to wilderness signatures for western Oregon in assigning roadless areas to wilderness as indicated by the statistical significance of WS in the W equation of Model 1 in Table 3, given acceptance of the above analysis of multicollinearity. The elasticity of the probability of wilderness assignment with respect to WS at sample mean values is .64. Also, the mean value of WS for wilderness assignment is higher in Table 1 than for nonwilderness assignment. On the other hand, the significantly positive coefficient and a positive elasticity of .29 on the DORS variable in Model 1 for nonwilderness assignment indicates that roadless areas were reserved for commodity production that had high DORS values. This is confirmed by the relatively high mean DORS value for roadless areas assigned to nonwilderness in Table 1.

The western Washington results in Table 4 exhibited multicollinearity between wilderness signatures (WS) and dispersed nonmotorized recreation (DNR). In the equation for nonwilderness assignment, DNR becomes insignificant when WS is added to Model 1 in Table 4 to form Model 2, and the simple correlation between the two variables is equal to .42. Again, Model 1 is used to analyze the significance of coefficients. In Model 1 as well as the other models for western Washington in Table 4, none of the variables are statistically significant determinants of wilderness assignment. However, WARS is a statistically significant negative determinant of nonwilderness assignment, suggesting that the Forest Service avoided the assignment of roadless areas with high wilderness ratings to nonwilderness and commodity utilization. The elasticity of the probability of nonwilderness assignment with respect to WARS at sample

TABLE 4
Multinomial Logit Results for the RARE II Wilderness Selection Process: Western Washington

Independent Variables	Model 1		Model 2		Model 3	
	W	NW	W	NW	W	NW
Constant	−8.1449	6.9662*	−8.2825	7.6471*	−9.8674	6.3812
	(1.20)	(1.75)	(−1.25)	(1.93)	(−1.18)	(1.38)
DORS	−.0932	.1448	.1211	.1068	−.0906	.1513
	(−0.79)	(1.41)	(−0.96)	(0.99)	(−0.65)	(1.23)
PH	−.0138	.1890*	−.0443	.2236*	−.0906	.2354*
	(−0.12)	(1.76)	(−0.35)	(1.92)	(−0.65)	(1.80)
DNR	−.0219	−.1395*	.0181	−.1242	.0229	−.1252
	(0.35)	(−1.77)	(0.29)	(−1.48)	(0.31)	(−1.40)
DMR	−.2243	−.3265	−.3803	−.1289	−.4560	−.1431
	(−0.38)	(−0.62)	(−0.62)	(−0.24)	(−0.67)	(−0.26)
WARS	.3717	−.3314**	.2820	−.3024*	.2425	−.3079*
	(1.35)	(−1.96)	(1.07)	(−1.85)	(0.84)	(−1.83)
WS			.0024	−.0013	.0033	−.0011
			(1.10)	(−1.20)	(1.30)	(−0.94)
WSA					.0017	.0010
					(1.07)	(0.71)
FPS					.0027	.0030
					(0.32)	(0.54)
FPAS					−.2141	−.2337
					(−0.41)	(−0.56)
NWS					.0002	.0001
					(0.22)	(0.23)
Statistics						
Chi-square	32.16		36.90		38.97	
Significance	.0004		.0002		.0067	
Pseudo-R^2	.29		.34		.35	

Note: A ** indicates significance at the 5% level for a two-tailed test; * indicates significance at the 10% level for a two-tailed test. W refers to wilderness, and NW refers to nonwilderness.

mean values is −2.61. Also, in Model 1 and the other models for western Washington, programmed harvest (PH) was a statistically significant positive determinant of nonwilderness assignment, indicating that the Forest Service allocated roadless areas with high programmed harvest levels to commodity utilization. The elasticity of the probability of nonwilderness assignment with respect to PH is .22. Finally, the Forest Service apparently avoided assigning roadless areas with high nonmotorized recreation potential to the nonwilderness category as suggested by the statistically significant negative coefficient on DNR and elasticity of −.21 with respect to DNR.

To determine whether the Forest Service allocated roadless areas differently in western Washington and Oregon, the samples from the two states were combined, and the multinomial logit model was used to obtain the results presented in Table 5. A dummy variable (ORE) was included in the model with a value I for Oregon roadless areas to test for differences in wilderness selection between Washington and Oregon. The dummy variable was also multiplied by each of the independent variables that were statisitcally significant in Model 3 of Table 3 for western Oregon and Model 3 of Table 4 for western Washington to test for shifts in the slope coefficients between the two states. This was not done for variables that were not statistically significant in the final models (Model 3) for western Washington and Oregon because of the theoretical likelihood of collinearity between the dummy variable ORE and variables lacking statistically significant slopes multiplied by the dummy variable. Because DNR turned out to be statistically significant in the model presented in Table 5, it was also multiplied by the dummy variable and included in the model.

The dummy variable (ORE) is positive and statistically significant for wilderness assignment in Table 5, suggesting that, other things equal, the extent of wilderness assignment in western Oregon was greater than western Washington. However, the dummy variable multiplied by WARS is statistically significant and negative in the wilderness assignment equation, suggesting that the Forest Service gave less consideration to wilderness characteristics in western Oregon than western Washington in wilderness assignment. Multiplying the derivative of the probability of wilderness assignment with respect to ORE and OREXWARS times their respective sample mean values results in the numbers .42 and $-.35$ respectively. The lesser attention given to wilderness attributes in western Oregon relative to western Washington almost offsets the higher level of wilderness assignment in western Oregon as indicated by the significantly positive coefficient on ORE. Why the Forest Service paid less attention to wilderness attributes in Oregon but assigned a higher number of roadless areas to wilderness, other things equal, is not clear. Perhaps the higher level of assignment was in response to political pressure from wilderness interest groups not fully reflected in wilderness signatures, and the more limited attention to wilderness attributes in Oregon may have occurred because of their generally lower level in western Oregon relative to western Washington.

The results so far obtained do not clearly distinguish the three hypotheses on Forest Service behavior. In the western Oregon sample, the DORS variable is a positive determinant of wilderness assignment, lending support to the budget maximization hypothesis. In the western Wash-

TABLE 5
Multinomial Logit Results for the RARE II Wilderness Selection Process: Western Washington Plus Western Oregon

Independent Variables	W	NW
Constant	−6.7736	6.6386
	(−1.04)	(1.59)
DORS	−.0718	.1535
	(−0.57)	(1.35)
PH	−.0105	.2165*
	(−0.08)	(1.77)
DNR	.0112	−.1631*
	(0.17)	(−1.96)
WARS	.2851	−.3212*
	(1.06)	(−1.84)
ORE	27.7096**	14.7166
	(2.21)	(1.29)
ORE × DORS	.1981	.1799
	(0.91)	(0.90)
ORE × PH	.2251	.1694
	(0.56)	(0.43)
ORE × DNR	−.0183	.0852
	(−0.15)	(0.71)
ORE × WARS	−1.3466**	−.7618
	(−2.25)	(−1.36)
DMR	−.4751	.1026
	(−0.95)	(0.41)
WS	.0003	−.00002
	(0.32)	(−0.02)
WSA	.0006	.0005
	(0.46)	(0.35)
FPS	−.0026	−.0010
	(−0.98)	(−0.91)
FPAS	−.1113	−.2295
	(−0.31)	(−0.67)
NWS	.0001	.0001
	(0.31)	(0.21)
Statistics		
Chi-square	72.80	
Significance	.00002	
Pseudo-R^2	.33	

Note: A ** indicates significance at the 5% level for a two-tailed test; * indicates significance at the 10% level for a two-tailed test. W refers to wilderness, and NW refers to nonwilderness.

ington sample, however, the PH variable is a positive determinant of wilderness assignment, providing support for the sustained yield value orientation hypothesis. In both instances, however, the elasticities are fairly small (.29 for DORS in Oregon and .22 for PH in Washington). The WARS variable was a positive determinant of wilderness assignment in western Oregon with a fairly high elasticity (1.09) and a negative determinant of nonwilderness assignment in both states with a relatively low negative elasticity (−.21) for western Oregon and a relatively high negative elasticity (−2.61) for western Washington, suggesting that the Forest Service may have catered to wilderness preservationists interests by the avoidance of assigning roadless areas with high wilderness attributes to the nonwilderness category in both states and by assigning roadless areas with high wilderness attributes to wilderness in one state. In western Oregon, wilderness signatures were a positive determinant of wilderness assignment with a fairly modest elasticity (.64), suggesting that the Forest Service paid some attention to public input. Finally, the Forest Service apparently gave little attention to the relative timber dependency of the two states since, other things equal, the level of wilderness assignment was actually somewhat higher in the more timber dependent state, although this was offset to a large extent by the less attention paid to wilderness attributes in western Oregon wilderness assignment than in western Washington. Thus far Forest Service behavior appears to be eclectic, giving attention to political pressure groups, sustained yield principles, and budget maximization.

As already noted, the RARE II assignment of roadless areas to the wilderness category simply constituted a recommendation to Congress that could either be accepted or modified.[32] As can be seen in Table 6, the configuration of roadless areas recommended for wilderness by the Forest Service was significantly modified by Congress in the Oregon and Washington Wilderness Acts of 1984.[33] The number of acres recommended by the Forest Service for wilderness was increased by Congress by approximately 200,000 acres in western Oregon and 300,000 acres in western Washington from a roughly equal base of approximately 200,000 acres each in the two states.[34] In terms of total acreage added to wilderness,

32. RARE II, *supra* note 2, at i.

33. Oregon Wilderness Act of 1984, 16 U.S.C. § 1132 (1988); Washington State Wilderness Act of 1984, 16 U.S.C. § 1132 (1988). Acreage data for each wilderness area added in 1984 was by letter from each of the national forests in western Oregon and Washington. Letters from J. D. MacWilliams, Mt. Baker-Snoqualmie National Forest, to D. E. Booth (Jan. 4, 1988); T. C. Stubblefield, Olympic National Forest, to D. E. Booth (Apr. 18, 1988); R. W. Williams, Gifford Pinchot National Forest, to D. E. Booth (Apr. 7, 1988); D. G. Mohla, Mt. Hood National Forest, to D. E. Booth (Apr. 6, 1988); J. H. Mayo, Willamette National Forest, to D. E. Booth (Apr. 21, 1988); R. J. Devlin, Umpqua National Forest, to D. E. Booth (Dec. 17, 1987); S. W. Deitemeyer, Rogue River National Forest, to D. E. Booth (Feb. 11, 1988); T. L. Thompson, Siuslaw National Forest, to D. E. Booth (Jan. 14, 1988); R. J. McCormick, Siskiyou National Forest, to D. E. Booth (May 31, 1988) [hereinafter Letters].

34. *Id.* RARE II, *supra* note 2 at O-2 to O-19, S-2 to S-15. See Table 6 for the summary data.

TABLE 6
RARE II and Congressional Wilderness Selection

		W. Oregon	W. Washington
RARE II			
	Wilderness Acres	195,524	209,950
	WARS	19.00	24.40
	DORS	8.29	7.50
	PH	2.86	3.47
Congress			
	Wilderness Acres	396,376	519,354
	WARS	20.52	24.11
	DORS	11.07	7.67
	PH	5.44	6.86

Note: WARS, DORS, and PH are in terms of mean values for roadless areas selected as wilderness.

western Washington wilderness advocates clearly faired better than their counterparts in western Oregon. Wilderness advocates in both states also gained more from Congress than they did from the Forest Service. In both states, the average programmed harvest (PH) of roadless areas included as wilderness was significantly increased in the congressional selection of wilderness in comparison to the RARE II results,[35] suggesting a greater extent of forest preservation by Congress in comparison to the Forest Service.

The determinants of congressional wilderness selection using RARE II data can be analyzed using a tobit procedure.[36] Because the boundaries of existing roadless areas were often readjusted in the congressional wilderness selection process,[37] the logit procedure cannot be employed. Instead of a categorical dependent variable, the dependent variable is now the proportion of the original roadless area assigned as wilderness by Congress.[38] Because the figure is zero for many roadless areas, the tobit procedure must be used to obtain valid regression results.[39] The interpretation of regression coefficients is the same as for ordinary least squares.

35. *Id.*

36. G. Madala, *supra* note 31, at 149-156.

37. Reasons for boundary changes made by the Senate to a House passed bill are indicated in S. Rep. No. 461, 98th Cong., 2d Sess. ___ (1984) (Washington Wilderness Act); S. Rep. No. 465, 98th Cong., 2d Sess. ___ (1984) (Oregon Wilderness Act).

38. Subsections of some roadless areas that had the same numerical designation and name but different letter designations in the RARE II analysis were combined for the analysis of congressional wilderness designation. In such cases, the independent variables for the subsections were weighted according to their relative acreage in the roadless areas as a whole and added together. Also, in some cases wilderness areas were given a different name than RARE II roadless areas. National forest maps were used along with maps in RARE II at O-7 to O-9 and S-5 to S-8 to determine which roadless areas were included in a given wilderness area. *See* RARE II, *supra* note 2, at O-7 to O-9, S-5 to S-8.

39. G. Madala, *supra* note 31, at 149-151.

The results of the tobit regressions are presented in Table 7. While coefficients and t-statistics are relatively stable for western Washington as variables are added to the model, this was not the case for western Oregon. As occurred in the logit analysis above, WS and FPS are negatively correlated with a simple correlation of −.84 causing collinearity between the two variables. Consequently, when FPS is added to Model 1 for western Oregon to form Model 2, WS becomes insignificant. For

TABLE 7
Tobit Regression Results for the Congressional Wilderness Selection Process: Western Washington and Oregon

Independent Variables	W. Washington	W. Oregon		
	Model 1	Model 1	Model 2	Model 3
Constant	−1.1435 (−1.09)	−5.4084** (−4.06)	−7.2515** (−3.38)	−6.6400** (−2.90)
W	.8566** (3.13)	.5501 (1.66)	.5563 (1.64)	.6287* (1.76)
DORS	−.0385* (−1.82)	.0206 (0.69)	.8182 (0.56)	.0153 (0.43)
PH	−.0231 (−1.61)	.0467** (2.33)	.0454** (2.26)	.0518* (2.02)
WARS	.0360 (0.88)	.1868** (2.78)	.1768** (2.56)	.1670** (2.35)
WS	.0005** (2.29)	.0004** (2.19)	.0011 (1.57)	.0009 (1.33)
FPS	−.0014 (−0.35)		.0009 (1.19)	.0007 (1.01)
DMR	−.0465 (−0.59)			−.0016 (−0.04)
DNR	.0098 (0.90)			−.0134 (−0.86)
FPAS	.1384 (1.20)	−.0207 (−0.46)		.0215 (0.11)
WSA	.00002 (0.07)			.0207 (0.46)
NWS	.0001 (1.03)			−.00001 (−0.23)
Statistics				
Squared Correlation, Observed and Expected Values	.66	.30	.30	.29

Note: A ** indicates significance at the 5% level for a two-tailed test; * indicates significance at the 10% level for a two-tailed test. ORE is a dummy variable set equal to one for the western Oregon roadless areas. The variable W is the proportion of a roadless area assigned to the wilderness category by the Forest Service in the RARE II process.

this reason Model 1 is used for interpreting the significance of independent variables in the western Oregon sample.

In addition to the RARE II variables previously described, the proportion of a roadless area originally assigned by the Forest Service to the wilderness category (W) is included as an independent variable. The roadless areas selected as wilderness in the RARE II process by the Forest Service clearly influenced the final selections by Congress, but did not by any means constitute the final determination. The proportion of a roadless area assigned to wilderness by the Forest Service is a statistically significant, positive determinant of congressional wilderness selection for western Washington but not for western Oregon with the exception of Model 3 in Table 7. The elasticity of the expected value of the proportion of a roadless area assigned to wilderness with respect to W is .49 for western Washington in Model 1 and it is .28 for western Oregon in Model 3. The statistically significant negative coefficient and elasticity of -2.3 on the DORS variable for western Washington suggests that roadless areas with high levels of development opportunities were avoided in the wilderness selection process in Washington. This was apparently not the case in Oregon where wilderness selection by Congress substantially increased the average DORS rating for roadless areas chosen as wilderness relative to the RARE II selections as indicated in Table 6. The positive statistically significant coefficient on the programmed harvest (PH) variable for Oregon and an elasticity of .48 suggests that wilderness areas were to some extent purposely selected in that state to encompass more heavily forested roadless areas. The wilderness ratings variable is also a statistically significant positive determinant of wilderness selection in western Oregon but not western Washington. The elasticity with respect to the WARS variable is a substantial 9.58 for western Oregon in Model 1. Because of a relatively high initial WARS rating for roadless areas selected as wilderness in the RARE II process for Washington, little improvement in the WARS rating could be expected by selecting additional roadless areas as wilderness. However, improvements were possible in Oregon by shifting roadless areas from the further planning category to the wilderness category, as can be seen in Table 1. Hence, WARS was more likely to be a determinant for Oregon, and one of the goals of Oregon wilderness advocates might have been to improve the average WARS rating for areas assigned to wilderness.

One difference between the RARE II and congressional wilderness selection process is that, in the case of Congress, public input made a bigger difference. The number of wilderness signatures (WS) for a roadless area was a positive statistically significant variable for both western Washington and Oregon rather than for just western Oregon as was the case in the Forest Service wilderness selection process. The elasticity for

WS is 2.0 in the western Washington sample and 2.2 in the western Oregon sample for the congressional wilderness selection process. This compares to an elasticity of equal to .64 for WS in the western Oregon sample for the Forest Service wilderness selection process. In comparison to the Forest Service, Congress was thus more interested in considering public views, at least those offered by wilderness advocates. This suggests that relative to Congress the Forest Service is somewhat more politically insulated from interest group influence, and provides limited evidence against the view that the Forest Service is primarily a political arbitrator between interest groups.

The final issue to be addressed is whether the level of congressional wilderness preservation was significantly less in western Oregon than western Washington after the effects of other variables have been taken into account. To accomplish this, the Washington and Oregon samples were combined and a dummy variable for Oregon (ORE) was included along with the dummy variable multiplied by each of the significant independent variables for the separate samples to capture any possible slope shifts between states. The statistically significant negative coefficient on the dummy variable in Table 8 clearly indicates that the level of wilderness selection was greater in western Washington than western Oregon, other things equal. The elasticity with respect to ORE is a substantial -7.71. However, the differences in slope coefficients on independent variables for the two states must be considered as well to insure that the higher level of wilderness selection in Washington was not simply offset by differences in the treatment of other variables between the two states. This can be taken into account by multiplying the dummy variable and statistically significant shift coefficients times the mean value of the corresponding variables and adding them to determine if the total is negative or positive. This calculation yields the number -2.277, suggesting that western Oregon would still have preserved less roadless area as wilderness than western Washington even if other variables were treated the same in the two states. In other words, the ability of Oregon wilderness advocates to encompass roadless areas with higher program harvests and development ratings in wilderness was not enough to offset the higher overall level of wilderness preservation in Washington. While Congress was responsive to wilderness advocates overall by substantially increasing the total amount of roadless area land allocated to wilderness, it did so to a greater extent in western Washington than western Oregon.

In marked contrast to the Forest Service, Congress thus treated western Washington and Oregon differently, choosing a lower level of wilderness preservation in Oregon. Why was this the case? A possible explanation, as already suggested, is that Oregon is more timber dependent than Washington and would thus experience relatively higher employment losses than Washington for an equal loss in the magnitude of the commercial

TABLE 8
Tobit Regression Results for the Congressional Wilderness Selection Process: Western Washington Plus Western Oregon

Independent Variables	
Constant	−1.3794 (−1.07)
W	.9274** (2.33)
DORS	−.0428 (−1.32)
PH	−.0179 (−1.19)
WARS	.0408 (0.75)
WS	.0006** (2.18)
ORE	−3.7309** (−2.10)
ORE × W	−.4172 (−0.86)
ORE × DORS	.0606 (1.41)
ORE × PH	.0551** (2.35)
ORE × WARS	.1210 (1.55)
ORE × WS	−.0001 (−0.28)
DMR	−.0086 (−0.22)
DNR	−.0013 (−0.14)
NWS	.000001 (0.07)
FPS	.0003 (0.79)
FPAS	.1475 (1.35)
WSA	.0004 (1.11)
Statistics	
Squared Correlation, Observed and Expected Values	.40

Note: A ** indicates significance at the 5% level for a two-tailed test; * indicates significance at the 10% level for a two-tailed test. ORE is a dummy variable set equal to one for the western Oregon roadless areas. The variable W is the proportion of the roadless area assigned to the wilderness category by the Forest Service in the RARE II process.

timber acreage base. In 1980, total employment in forest products industries in Oregon was 78,886 while the comparable figure in Washington was 61,063.[40] In Oregon the forest products industry constituted 36.2 percent of manufacturing employment and 9.4 percent of private sector employment in 1980, while the comparable figures for Washington were 19.4 percent and 4.8 percent.[41] These figures suggest that local Senators and Congressmen would be relatively more sensitive to a given employment loss in Oregon than Washington because of the relatively larger impact such a loss would have on the Oregon economy. In local wilderness selection decisions, local members of Congress would likely have a disproportionate influence because of their capacity to engage in logrolling and vote trading with nonlocal members of Congress. Also, Senators from Oregon and Washington were members of the committee that held hearings on the Oregon and Washington wilderness acts and recommended the acts to the Senate for approval.[42]

An alternative explanation for the higher level of preservation in Washington is that demand for wilderness was relatively greater in Washington because population was 57 percent larger in Washington than Oregon in 1980, and Congress took this into account in allocating roadless areas to wilderness in the two states.[43] Since the Forest Service assigned equal amounts of roadless area to wilderness in the two states, such demand considerations apparently did not enter into its decisionmaking process. Population, however, is probably not a very good indicator of demand for wilderness use, particulary because such a small percent of the population uses wilderness. A somewhat better measure of relative demand for wilderness may be membership in wilderness advocacy organizations. In 1981, Sierra Club membership was approximately equal at 4,062 for Washington and 4,052 for Oregon. In 1985, Wilderness Society membership in Oregon was 5,226 for Washington and 3,427 for Oregon, while the Sierra Club figures for Washington had increased to 8,069 and for Oregon to 6,515.[44] These data suggest that during the RARE II process in the late 1970s membership in the two wilderness groups was probably roughly equal in the two states even though Washington's population was

40. U.S. Bureau of the Census, County Business Patterns—Oregon, Pub. No. C3.204:80-39, (1980); U.S. Bureau of the Census, County Business Patterns—Washington, Pub. No. C3.204:80-49, (1980).

41. *Id.*

42. *Oregon Wilderness Act of 1983, Part 1: Hearings on S. 311-24 Before the Subcomm. on Public Lands and Reserved Water*, 98th Cong., 2d Sess. (1984); *Washington State Wilderness Act of 1983: Hearings on S. 311-21 Before the Subcomm. on Public Lands and Reserved Water*, 98th Cong., 2d Sess. (1984).

43. U.S. Bureau of the Census, 1980 Census of Population, Chapter A, Part 39, Pub. No. C3.223/6:980/A-39, 1, (1980); U.S. Bureau of the Census, Pub. No. C3.223/6:980/A-49, 1 1980 Census of Population, Chapter A, Part 49 (1980).

44. Membership data was obtained from the Sierra Club and Wilderness Society.

greater. By 1985 the combined membership of the two groups was 34 percent greater in Washington than Oregon. If membership can be roughly interpreted as a measure of demand, relative demand was roughly equal in the two states at the time of the RARE II process even though Washington had a larger population and that relative demand was shifting towards Washington by the mid-1980s.

Looking at such measures of demand provides an incomplete picture without considering the supply of wilderness available in western Washington and Oregon. The additional wilderness demanded by the residents of the two states will depend on the amount of wilderness already available. If substantial wilderness is already available, the additional amount demanded would likely be less. The availability of national park lands and wilderness prior to the passage of the 1984 wilderness acts was 2,020,711 acres in western Washington and 534,722 acres in western Oregon.[45] Clearly, the availability of reserved lands where wilderness recreation could be undertaken was much greater in Washington than Oregon, suggesting the unfulfilled demand for wilderness was relatively greater in Oregon than Washington. While population was only 57 percent greater in Washington, the amount of reserved lands in western Washington was 278 percent greater than in western Oregon. In relative terms, then, demand for added wilderness should be greater in Oregon than Washington.

Perhaps the best measure of demand for additional wilderness is the amount of signatures in favor of wilderness selection in the RARE II process for the two states, a figure that was 147 percent greater in western Oregon than western Washington.[46] The nonwilderness signatures were disproportionately higher in Oregon than in Washington too, but this could well be a reaction to a higher level of wilderness advocacy in Oregon than in Washington. Presumably, the signatures response of timber interests would be roughly proportional to their numbers in the face of a roughly equal threat to their interests. Because employment figures for forest products are only slightly higher in Oregon than Washington, timber interests must have perceived a greater threat from wilderness advocates in Oregon than Washington since nonwilderness signatures were 191 percent greater in Oregon than Washington.[47] This casts doubt on the

45. Figures for wilderness area acres were by letters from the national forests in western Washington and Oregon. Letters, *supra* note 33. Acreage data for the Mt. Rainier, Olympic, and North Cascades National Parks were respectively taken from the following references: North Cascades Study Team, The North Cascades: A Report to the Secretary of The Interior and the Secretary of Agriculture 23 (1965); Richardson, *Olympic National Park: 20 Years of Controversy*, 12 J. Forest Hist. 12 (1968); A. Sommarstrom, *Wild Lands Preservation Crisis: The North Cascades Controversy* 127,133 (University of Washington, Ph.D. dissertation, 1970).

46. Calculated from data in RARE II, *supra* note 2, at U-1 to U-40.

47. *Id.*

notion that the demand for additional wilderness was greater in western Washington than Oregon and leaves the timber dependency hypothesis as a more likely explanation for the lower level of wilderness preservation in western Oregon than Washington.

CONCLUSION

In the final wilderness selection process, Congress was influenced by two predominant forces. First, by increasing the amount of roadless area designated as wilderness relative the the RARE II recommendations and by giving more weight in its decisionmaking to the number of wilderness signatures than the U.S. Forest Service, Congress was clearly interested in appeasing the desires of wilderness advocates. However, by increasing the amount of roadless areas designated as wilderness by a lesser amount in western Oregon than in western Washington relative to the RARE II recommendations, Congress was more concerned with the relative impact of reductions in the commercial timber base in Oregon than in Washington, possibly because of the higher degree of dependency on timber in Oregon. The Forest Service, on the other hand, in its RARE II wilderness selections seemed interested in keeping roadless areas with a high development opportunities rating and high programmed harvests outside of the wilderness system, although it did pay attention to wilderness signatures and wilderness attributes in its roadless area assignment process as well. The Forest Service gave less consideration to political interests than Congress did by assigning fewer roadless areas to wilderness and by ignoring differences in timber dependency between the two states. This suggests that relative to Congress the Forest Service was more strongly motivated either by adherence to sustained yield principles or budget maximization than by a desire to arbitrate between conflicting political interests. The statistical results presented above do not distinguish effectively between the value commitment hypothesis or the budget maximization hypothesis. However, since the Congress did not fully agree with the Forest Service position on the allocation of roadless areas to wilderness, Congress did not behave in a manner that would either maximize the Forest Service's budget or promote sustained yield forestry. Because the budget maximization hypothesis is dependent on congressional cooperation, it would not be fully validated by the results of this study even if it were possible to establish that budget maximization prevailed over sustained yield principles within the Forest Service.[48] The Forest Service may have pursued a budget maximizing strategy, but Congress did not because it added roadless areas with high DORS ratings to the wilderness system.

48. Johnson, *supra* note 4, at 106-114.

Finally, in his analysis of RARE II data for a number of western states, Mohai found that the WARS rating and signature variables were the most predictive of RARE II designations and that resource variables and the DORS ratings had little relationship to designation in general and nonwilderness designation in particular.[49] Nonetheless, a large majority of roadless areas were designated as nonwilderness by the Forest Service in the RARE II process. Mohai concluded that the Forest Service was indeed somewhat sensitive to public input, particularly in its designation of roadless areas with high levels of wilderness signatures to wilderness, but that a high overall level of nonwilderness designations indicated that the Forest Service was defending its traditional value commitment to sustained yield resource development.[50] The above results on the RARE II process in western Washington and Oregon not only generally confirm this conclusion, but also provide a benchmark for comparison—the actual wilderness selection process by Congress. Relative to Congress, the Forest Service was less sensitive to political input and assigned much less roadless area acreage to wilderness in an apparent attempt to preserve greater flexibility in control of land use that comes with a nonwilderness designation.

49. Mohai, *supra* note 3 at 143-152; Mohai, *Rational Decision Making and the Planning Process: Some Empirical Evidence from RARE II*, 17 Envtl. Law 507-556 (1987). In the latter reference, discriminant analysis results are included for the states of Oregon and Washington as a whole. For Oregon Mohai finds wilderness signatures (WS), further planning signatures (FPS), wilderness attributes (WARS), and development opportunities (DORS) to be statistically significant determinants of assignments along with grazing and low-value bulk, while for Washington he finds wilderness attributes and coal potential to be statistically significant. Because of the low value of coal potential, its significance for Washington is probably circumstantial as Mohai suggests. He makes a similar conclusion with respect to low-value bulk minerals in Oregon. The significance of grazing would apply predominantly to eastern Oregon. These results are consistent with those found for western Oregon and Washington in the multinomial logit analysis above, except that PH and DNR were also found to be significant determinants for western Washington. Given that the western portions of the two states are more heavily forested than the eastern portions, some differences in the determinants of assignment are to be expected between the western portions and the state as a whole.

50. Mohai, *supra* note 3, at 153-155.