ENERGY IMPACTS OF THE ROADLESS RULE

JOINT OVERSIGHT HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY AND MINERAL RESOURCES

AND THE

SUBCOMMITTEE ON FORESTS AND FOREST HEALTH

OF THE

COMMITTEE ON RESOURCES
U.S. HOUSE OF REPRESENTATIVES

ONE HUNDRED SEVENTH CONGRESS

FIRST SESSION

April 4, 2001

Serial No. 107-16

Printed for the use of the Committee on Resources

Available via the World Wide Web: http://www.access.gpo.gov/congress/house
or
Committee address: http://resourcescommittee.house.gov

U.S. GOVERNMENT PRINTING OFFICE

71-552 PS WASHINGTON : 2001

For sale by the Superintendent of Documents, U.S. Government Printing Office
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C O N T E N T S

	Page
Hearing held on April 4, 2001	1
Statement of Members:	
Cubin, Hon. Barbara, a Representative in Congress from the State of Wyoming	3
Prepared statement of	5
Kind, Hon. Ron, a Representative in Congress from the State of Wisconsin, Prepared statement of	14
McInnis, Hon. Scott, a Representative in Congress from the State of Colorado, Prepared statement of	2
Otter, Hon. C.L. "Butch", a Representative in Congress from the State of Idaho, Prepared statement of	17
Rahall, Hon. Nick J. II, a Representative in Congress from the State of West Virginia	6
Statement of Witnesses:	
Eppink, Jeffrey, Vice President, Advanced Resources International	35
Prepared statement of	37
Lance, Hon. Alan G., Attorney General, State of Idaho	8
Prepared statement of	10
Morton, Dr. Peter A., Resource Economist, The Wilderness Society	57
Prepared statement of	58
Letter from The Ecological Society of America submitted for the record	68
Moyer, Steve, Vice President of Conservation Programs, Trout Unlimited	38
Prepared statement of	43
Letter to The Honorable Barbara Cubin and The Honorable Ron Kind submitted for the record	40
Phillips, Randle G., Deputy Chief for Programs and Legislation, Forest Service, U.S. Department of Agriculture	30
Prepared statement of	32
Letters from the Office of Advocacy, Small Business Administration, and other materials submitted for the record	72
Schaefer, Greg, Director, External Affairs, Arch Coal Company	47
Prepared statement of	48
Additional materials supplied:	
Report entitled "Endogenous Substitution Among Energy Resources and Global Warming" submitted for the record	125

JOINT OVERSIGHT HEARING ON "ENERGY IMPACTS OF THE ROADLESS RULE"

Wednesday, April 4, 2001
U.S. House of Representatives
Subcommittee on Energy and Mineral Resources, joint with the Subcommittee on Forests and Forest Health
Committee on Resources
Washington, DC

The Subcommittees met, pursuant to notice, at 1:27 p.m. in Room 1324, Longworth House Office Building, Hon. Scott McInnis, [Chairman of the Subcommittee on Forests and Forest Health] and Hon. Barbara Cubin [Chairman of the Subcommittee on Energy and Mineral Resources] presiding.

Mr. McINNIS. The Committee on Resources Subcommittee on Forest and Forest Health in the joint oversight hearing on energy impacts of the roadless rule will come to order.

Here is what our schedule looks like this afternoon. As you know, it is 1:30 now. That clock is wrong, by the way. A couple of things we would like to go over. Number one, we would like to have this hearing completed within a two-hour period of time. Unfortunately, during that period of the two hours we will be interrupted with voting, which we did not anticipate, but the meeting must conclude by 3:30.

With that in mind, what I have done as Chairman is exercised my discretion and taken the witness list out of order. I intend to call our witnesses first who are from out of town in hopes that we can complete your testimony.

Under the rules of this Committee we allow the witnesses 5 minutes. We have a timer that is sitting on your desk there on the witness table. I ask that you comply with it. It gives you warning when you come close to the end of your time expiration. And in order that we can complete as much of this hearing as possible within the allotted time, I ask that everyone respect the time limits that have been allotted.

Congresswoman Cubin will be joining us shortly. She is co-chairing the meeting so I would expect that I will turn the meeting over for her to chair not long after she gets here.

I am going to go ahead and waive my opening remarks, again in hopes, as a courtesy to the witnesses, that we can get as many witnesses as possible on so I will submit my remarks for the record.

[The prepared statement of Mr. McInnis follows:]

Statement of The Honorable Scott Mcinnis, Chairman, Subcommittee on Forests and Forest Health

The RARE I and RARE II (Roadless Area Review and Evaluations) in 1971 and 1977, were attempts to deal with the debate over roadless areas, each in a single national process. Both times, they proved unsuccessful legally and politically. In response, through passage of the National Forest Management Act (NFMA) in 1976, Congress provided for the further protection of roadless areas, but on a forest-by-forest basis. It directed the Forest Service to develop forest plans for the management of those forests, utilizing significant local and state input, then move resulting wilderness recommendations through Congress. This process, while deliberate and at times cumbersome, resulted in significant protections for roadless areas and the creation of more than 30 million acres of congressionally designated wilderness on the national forests. While somewhat controversial, this process nevertheless managed to resolve most disagreements through thoughtful compromise. Ultimately and unfortunately, these compromises were not acceptable to some groups and individuals, who were then able to convince the Clinton Administration to take another run at the roadless issue in yet another single national process. Repeating the mistakes of history, the Clinton Administration moved forward a top-down roadless rule-making process, trading a hard-won local consensus for an explosive national controversy. In so doing, it created a new, illegal process with striking similarities to the failed RARE I and RARE II national initiatives.

This is unfortunate because to most of us in Congress there has never been any question that some roadless areas deserve further protection, it is simply a matter of how best to do it. To cram a one-size-fits-all political edict down the throats of the states could not have been more polarizing and damaging to the issue itself. It should therefore come as no surprise that a number of states have filed, or are in the process of filing, lawsuits against the rule -- and it is likely that the states will prevail. This also should come as no surprise, considering that the Administration denied all Freedom of Information Act requests and all Cooperating Agency Status applications filed by affected states. Consider also that accurate maps were not made available during the public comment period, in violation of the Administrative Procedures Act. Consider that the Administration developed the policy in lockstep coordination with a handful of national environmental groups and in conjunction with their multimillion dollar roadless campaign—a likely violation of the Federal Advisory Committee Act. Consider that no small business or small government analysis was done to comply with the Regulatory Flexibility Act. Consider that many forest plans will have to be revised as a result of the rule, violating the National Forest Management Act. Consider that it usually takes the Forest Service two to three years to do a legally defensible EIS for a timber sale covering only 300 acres, yet it took the Administration only one year to do a single massive EIS covering 58 million acres. How many "considerations" does it take before it becomes painfully obvious that the roadless initiative was not undertaken to solve environmental problems but rather was done for the purpose of creating a partisan political issue.

It's no secret that if you want broad national policies to be accepted broadly, you must get a critical mass of buy-in from the public, both nationally and locally. Polls asking only whether roadless areas deserve protection, while avoiding how this should be done, do not accurately represent the public's sentiments on the issue. Anyone who really believes that a lasting solution to the roadless debate can be achieved by forcing it through politically, at the national level, without substantial involvement at the state and local level is delusional.

I am willing to work with anyone concerning further protection of roadless areas, but never at the expense of effective local participation. These are not mutually exclusive goals and, in fact, they can only be achieved together.

Mr. McINNIS. I would also request that other members of the Committee waive their opening remarks and just submit them for the record. Is that all right, Mr. Udall? Mr. Otter?

Mr. OTTER. That is fine.

Mr. McINNIS. Mr. Otter, would you like to introduce the first witness?

Mr. OTTER. Thank you very much, Mr. Chairman. Let me begin by thanking you for calling this very important meeting that has had a devastating effect on Idaho—on our economy and our way of

life, on our big game habitat, you name it. It has been a problem for us.

I am proud to bring before the Committee today Alan G. Lance, who is the Attorney General for the State of Idaho. Al Lance was elected as the 31st Attorney General of the State of Idaho in 1994 when I was elected to my third term as Lieutenant Governor for the State, and Al and I had the chance to work a term and a half very close together.

Attorney General Lance's leadership has resulted in the successful consolidation of legal services to the State of Idaho, an effort sought by previous Attorneys General for more than two decades. So General Lance is well known for his austere moves and abilities to save Idaho taxpayers as much as $1.6 million thus far and many more to come.

General Lance has done a terrific job on a national front for the State of Idaho. He is recognized as a national leader in the battle against domestic terrorism. Legislation that he sponsored in Idaho has become a national model for dealing with the extremist groups and the surviving families.

General Lance signed a monumental agreement with the tobacco industry on November 18, 1998, unprecedented by any of our sister states, for $712 million, which is the largest civil settlement in Idaho's history.

General Lance has served as the Chairman of the Conference of Western Attorneys General in 1999 and the year 2000 and he is currently a member of the Strategic Planning Committee on the National Association of Attorneys General.

Mr. Chairman, I bring before you today a well qualified advocate for the position which I hold for the State of Idaho and the roadless area issue and I am proud to say the champion, the first champion that has been willing to come forward to subject the last Administration's land grab in the State of Idaho and in the West to court resolve.

Mr. Chairman and members of the Committee, I present to you Alan G. Lance, Attorney General of the State of Idaho.

Mr. McINNIS. Mr. Lance, prior to you beginning your testimony I would like to welcome the Co-Chair of the Committee, Barbara Cubin, Congresswoman from Wyoming. I will turn the microphone over to her. Following her remarks, Mr. Lance, we will go immediately to your remarks.

STATEMENT OF THE HONORABLE BARBARA CUBIN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WYOMING

Mrs. CUBIN. Thank you and thank you for your patience.

This Subcommittee meets today jointly with our sister Subcommittee on Forests and Forest Health, in our oversight capacity to take testimony on the impact of the Clinton Administration's roadless area conservation rule. Our Subcommittee wishes to focus on the "opportunity costs" of this policy upon our nation's energy supply. By that I mean the potential of the affected National Forest System lands to host deposits of natural gas, coal, oil and other mineral resources which could contribute to domestic energy supplies.

The Energy Subcommittee has held several such oversight hearings to examine the role of public lands and minerals and what role they can play in alleviating the current energy crisis. We are now focusing on the roadless rule. With the able assistance of Chairman McInnis, we hope to understand better the pending transportation policy of the U.S. Forest Service. I guess it is not pending; it is the case now.

My interest in this issue was aroused when I learned that late last year that the Department of Energy had contracted to analyze the impact of the draft roadless rule on oil and gas resources availability. Despite the serious concerns raised by the DOE, senior officials of the OMB and also the Council on Environmental Quality, the Forest Service and several influential environmental groups decided to meet in early December of 2000 and recommend to President Clinton an alternative which they knew would have a major impact. There certainly was an effort by some to write a rule which would not have reached the $100 million impact threshold by exempting mineral leasing activities from the roadless policy. In the end though, the decision was made to exempt no one. Instead they chose to forge quickly ahead with the little time available in order to make the "midnight rule" effective before the new President was sworn in. And we are all left to clean up the mess.

I have concerns that the past Administration inadequately analyzed the impact of the rule upon the small business community, a requirement of the Regulatory Flexibility Act for major rules. But this is hardly the first time they have run roughshod over these folks. The small hardrock mineral miners successfully sued when the BLM tried to ignore them in a rush to make new rules. Perhaps that will also be the case here, although I am told that the Forest Service has argued that the roadless policy is not subject to this law.

One legacy of Bill Clinton which is just beginning to be recognized is the energy situation in which our nation has been left. The past decade was one of denial. The Internet-driven economy was booming. Why should they worry about power demands versus supplies? The previous Administration felt OPEC could not set the price of crude oil like they did in the '70's and '80's, so why should they concern themselves about import dependence? They felt natural gas was so plentiful that we would be able to put off-limits some of the best hunting grounds for replacement supplies—including the public lands of our Rock Mountain basins with high potential for development of significant energy resources. We are all feeling the effects of that poor policy direction.

The cavalier attitude of the past CEQ Chairman and the recently retired Chief of the Forest Service is simply baffling. As with the argument that ANWR's estimated 10 billion barrels of oil represents only six months of domestic demand, so it was said that DOE's estimate of 11 trillion cubic feet of roadless area gas is only six months of our national production. In the aggregate these amounts do matter.

Chief Dombeck even stated in a January 5, 2001 letter to OMB, and this is a quote, "If exploration and development did occur, it would likely be five to 10 years before any production would occur, because oil and gas leasing is a lengthy process. Therefore the

value would not be realized in the near future and any production would be spread over multiple years in the future."

So what is wrong with this picture? Mr. Dombeck acknowledged that natural gas to be developed from these lands would be an additional increment of supply over many years, not six months. Yet he argued against exempting energy leasing from the roadless proposal, anyway. On the date he signed this letter spot prices for natural gas were hovering around $10 per million BTUs of energy—five times the long-term average—and in Southern California the prices were hitting over $50. But because roadless gas could not get to market this winter, the previous administration chose to continue down the road of denial. They chose to lock up these resources and further reduce our ability to increase our own energy supply.

In addition to the gas resources taken off the board, there was a great deal of access to coal reserves also restricted by this policy. The former Chief felt there was plenty of coal outside the roadless areas, so they should not worry about the rule's impact on coal production. This was while California was warning that rolling blackouts were about to happen, and they did happen.

I am here to tell you they will need more coal-fired power from Utah, not less. What were they thinking when they recommended that Bill Clinton promulgate this rule? Could they have been any more short-sighted than they were? It reminds me of the story of how Nero fiddled while Rome burned.

Chairman McInnis, I look forward to this hearing and I look forward to the testimony of our witnesses as we try to understand the effects of this roadless policy.

[The prepared statement of Mrs. Cubin follows:]

Statement of The Honorable Barbara Cubin, Chairman, Subcommittee on Energy and Mineral Resources

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Chairman McInnis, I look forward to hearing the testimony of our witnesses as we try to understand the effects of this roadless policy.

Mr. MCINNIS. Thank you, Madam Chairman.

Now I will recognize Mr. Rahall. Then we will go to you, Mr. Lance, but I will recognize Mr. Rahall to present the minority opening remarks, as well as his own. Mr. Rahall?

STATEMENT OF THE HONORABLE NICK J. RAHALL, II, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WEST VIRGINIA

Mr. RAHALL. Thank you, Mr. McInnis. Mr. Chairman, I appreciate very much your allowing me to give this opening testimony.

If the government is to run more like a business, as many in the business community have urged us to do throughout the years, then it would seem to me that we should all agree that the roadless rule makes economic sense. I make this observation because the 380,000 miles of roads in our national forests are not by any stretch of the imagination being maintained. The Forest Service is receiving only about 20 percent of the funds it annually needs to keep these roads in repair and we are faced with an $8.4 billion

capital improvement backlog. The results—a rash of public health, safety and environmental threats.

Once built, people in rural communities begin to use many of these roads but they do so at their own peril. The state of disrepair is so bad that landslides and slope failures put not only these people at risk but also endanger entire watersheds and critical fish and wildlife habitats.

It seems to me that prudence dictates that we first fix what we have rather than build more roads in national forests only to then have them deteriorate once the timber or energy companies are done with them.

Frankly, I believe it is unfair to the American taxpayer to have to shoulder this burden. The public is being called upon to subsidize these extractive industries, to add to their profit margin, and then to be saddled with the responsibility of maintaining these roads long after the timber is gone, the oil and gas is drilled, or the coal is mined. That is hardly an attractive proposition.

So I would submit that the first question, Mr. Chairman, that we should ask is whether these industries are willing to help finance repairing the existing roads as well as pay to maintain any new roads before any consideration is given to opening up these roadless areas. If they are, then in my opinion we have something to discuss, but I do not see that mentioned in any of the testimony that will be given to us today.

We have had several hearings in this Committee already on the issue of producing more energy from public lands and I think those calling these hearings are becoming more desperate. Energy production from these lands was at an all-time high during the Clinton Administration. Oil production from Federal areas already account for 27 percent of the U.S. total: natural gas, 38 percent of the total; coal, 33 percent of that total. And where will the major new production could come from? The OCS? Well, much of that is off-limits due to leasing moratoria supported by both Republicans and Democrats.

So this Committee is now reduced to looking at opening up national monuments and pristine roadless areas, which amount to only 2 percent of the lands in the continental U.S. If that is the case, why not set a drill pad down in Yellowstone National Park? It would be 100 percent certain that wells at Old Faithful would generate geothermal power. While you are at it, why not build a dam in Grand Canyon National Park? It would be 100 percent certain that hydropower from the new dam on the Colorado would generate electricity. But the fact of the matter is that the American people would overwhelmingly oppose such a trade-off of national treasures for energy development.

I do not believe that this nation is so desperate, so short of alternatives, that we should now sacrifice our remaining pristine forest roadless areas which, by the way, have been opened to energy leasing for decades, so that the American people will have what apparently some view as the honor of subsidizing these activities even further. Thank you, Mr. Chairman.

Mr. McINNIS. Welcome Mr. Inslee, the Ranking Member on the Forest Subcommittee.

Mr. Lance, we are now prepared for you to begin your comments. You may proceed.

STATEMENT OF THE HONORABLE ALAN G. LANCE, ATTORNEY GENERAL, STATE OF IDAHO, ACCOMPANIED BY THORPE ORTON, DEPUTY CHIEF OF STAFF

Mr. LANCE. Thank you, Mr. Chairman, Madam Chair. Let me take this opportunity to introduce Thorpe Orton, my Deputy Chief of Staff, who has been the project manager on the roadless proposal.

Congressman Otter, thank you very much for that generous although brief introduction.

Congressman Simpson, good to see you again, sir.

Congressman Rahall, thank you for your perspective on this.

My good friend, Tom Udall, former attorney general of New Mexico, Tom.

Congressman Udall, nice to see you, Mark, and Congressman McCollum.

Let me start out by explaining Idaho's lawsuit. First of all, it was filed on behalf of the Land Board. The Land Board consists of five constitutional officers, which would be the governor, the attorney general, the superintendent of public instruction, the secretary of state and our controller, five constitutional officers. The Land Board's responsibility is to manage the state lands within the State of Idaho. The proceeds of that management go to fund our endowed institutions, which are the schools, and for the benefit of the school children of the State of Idaho.

For the minority members I think it is significant to note that all five members of the Land Board filed the lawsuit and have been opposed to this roadless initiative from its inception. The composition is three Republicans and two Democrats on the Land Board in the State of Idaho and all five are plaintiffs in the lawsuit against the Forest Service at the present time. In Idaho this is not a partisan issue; this is a bread and butter issue.

Sixty-five percent of our land mass in the State of Idaho is presently under Federal management, and I might say mismanagement. Last year we lost 1.2 million acres to forest fires as a result of years of neglect, by the Forest Service and forest policy.

Idaho has actually filed two lawsuits against the roadless initiative. The lawsuits were filed through the Idaho State Board of Land Commissioners, which I have described to you. The Land Board is bipartisan, composed of five statewide-elected constitutional officers. The Land Board manages the State of Idaho's endowment lands to maximize revenue for our public schools, whose lands are impacted by the roadless rule substantially.

The thrust of our case is quite simple. NEPA requires meaningful public notice and comment and that means meaningful to the citizens of the State of Idaho, who stand to lose 9.5 million acres in inventoried roads to this initiative.

President Clinton called the roadless initiative one of the largest land preservation efforts in America's history. It was not, however, put through anything close to an equally historic public comment period. Instead, the notice of intent was issued just six days after President Clinton's announcement. The public was given just 60

days to comment during the scoping period. Forest Service Chief Michael Dombeck called the proposal urgent and told his agency that it cannot afford to waste a single day. Indeed the roadless proposal impacts 58.5 million acres of inventoried roadless areas. We cannot tell how many acres of uninventoried acres are impacted but Idaho alone accounts for 9.5 million acres of inventoried roadless lands.

The Forest Service-touted website for public information on the roadless service was, by and large, totally useless during the entire scoping period. Public meetings in Idaho began just 12 business days before the deadline expired. The Freedom of Information Act information which was requested and filed by my office, was totally ignored and we had to bring a lawsuit to get the information that we desired.

Idaho's first lawsuit was filed on December 30, 1999. The court had to dismiss our lawsuit at that time due to the issue of ripeness but it provided a rather stern warning to the Forest Service. The warning included the following statements by the court, and I quote. "The Forest Service should make every effort to ensure that the process is properly implemented with reasonable time frames to allow meaningful participation by the public."

And I quote again. "When the areas contemplated to be roadless are not defined or shown by way of maps or otherwise illustrated, one does not have to be learned in the law to determine that the public's participation will hardly be meaningful."

I quote again. "The Forest Service should proceed with caution. Time is not of the essence on this issue that has been studied for over 30 years."

Idaho's second lawsuit: Despite Idaho's efforts and the court's warning, the Forest Service pressed forward, rejecting requests for extensions of comment periods and ignoring Freedom of Information Act requests. The DEIS comment period was a laughable 69 days. The Idaho State Board of Land Commissioners provided an additional comment to the Forest Service immediately after the Final Environmental Impact Statement was issued on November 13, 2000. The Land Board also requested a face-to-face meeting with Secretary Glickman and Chief Dombeck. We never heard anything back as a result of our request to them. Maps or other identification of the uninventoried areas were never provided to the people of the State of Idaho.

Accordingly, given the court's clear directives to the Federal Forest Service and our concerns, the State of Idaho filed a second lawsuit on January 9, 2001. We are currently awaiting the court's decision on the state's motion for a preliminary injunction and that was argued last Friday.

Idaho is concerned with the roadless rules and its impact on energy, particularly given the current energy crisis. Idahoans typically pay close to the highest prices in the nation for gasoline. Adverse impact in other states will trickle down to the price that we pay at the pump in the State of Idaho.

With respect to mineral extraction, the Final Environmental Impact Statement details impacts associated with phosphate mining in the Caribou National Forest. The annual economic impacts are set forth in the FEIS at Table 3-68.

In conclusion, Chairman, let me thank you again for the opportunity to be here. You may be aware that the State of Colorado has joined with Idaho in its case against the roadless rule. In addition, I understand that the State of Alaska has now filed its own lawsuit. These three states contain almost 49 percent of the total inventoried acreage impacted by the roadless rule. I have heard that several other Western states may be filing suits too, including the states of Wyoming, Montana, North and South Dakota.

Thank you, Chairman, for your consideration and time.

[The prepared statement of Mr. Lance follows:]

Statement of The Honorable Alan G. Lance, Attorney General, State of Idaho

I would like to thank Chairwoman Cubin and the members of the subcommittees for inviting me to testify here today. It is an honor to appear before you as the chief legal officer of the State of Idaho to speak about an issue that is extremely important to the citizens of Idaho.

It is my understanding that this hearing focuses on the effect of the Roadless Area Conservation Rule on this nation's energy resources. The State of Idaho does indeed have significant concerns about the roadless rule and its effect on Idaho's economy. The most immediate economic concern of the State of Idaho relates to our endowment lands which are contiguous to or surrounded by the roadless areas. The endowment lands must be managed by the Idaho State Board of Land Commissioners (Land Board) for the benefit of Idaho's public schools. The State of Idaho has 9.3 million acres of inventoried roadless areas, and the Forest Service has not yet told the State how many acres of uninventoried areas in Idaho would qualify as roadless. I also understand that the subcommittees are particularly interested in the reasons why the State of Idaho has filed a lawsuit against the roadless rule.

As a threshold matter, let me make clear that Idaho's legal case focuses on the process followed by the United States Department of Agriculture in proposing and implementing the roadless rule. The National Environmental Policy Act (NEPA) is a procedural law, requiring certain steps be followed by federal agencies. The process followed by the Department of Agriculture in adopting the roadless rule wholly ignored the procedural requirements of NEPA.

The State of Idaho, through the Idaho State Board of Land Commissioners, which is bipartisan and composed of five statewide elected constitutional officers, unanimously agreed to file two lawsuits against the roadless initiative. The first lawsuit was filed on December 30, 1999, during the NEPA process and shortly after the scoping period expired. The second lawsuit was filed on January 9, 2001, shortly after completion of the NEPA process and adoption of the rule. The second lawsuit is currently pending in the United States District Court for the District of Idaho.

From the beginning, the State of Idaho was concerned with the short timeframes and information provided for public notice and comment. Moreover, when those concerns are considered in the context of a NEPA proposal of such historic scope, impacting 58.5 million acres nationwide, the quality of the public notice and comment provided rises to the level of a legal deficiency. As you know, NEPA was enacted to ensure fully informed and well-considered decisions on proposed actions with environmental consequences. In other words, public notice and comment must be "meaningful" in order to comply with NEPA.

The roadless rule was first announced by former President Clinton on October 13, 1999, at which time he characterized it as "one of the largest land preservation efforts in America's history." Just six days later, the Department of Agriculture initiated the scoping period by publishing a notice of intent to prepare an environmental impact statement. The fanfare surrounding the announcement also included Forest Service Chief Dombeck's October 28, 1999, letter to Forest Service employees, wherein he characterized the roadless proposal as an "urgent" need and stated that the agency "cannot afford to waste a single day.—

The public was given only sixty (60) days to comment during scoping. Public meetings were scheduled in Idaho starting just twelve (12) business days and ending just three (3) business days before the end of scoping. Requests for an extension of the scoping period from Idaho Governor Kempthorne and from myself and six (6) other western Attorneys General were ignored. A Freedom of Information Act (FOIA) request sent by my office for pertinent information was also ignored. Meanwhile, the Forest Service's touted website for public access and information on the roadless proposal was, by and large, totally useless during the entire scoping period. Finally,

despite the fact that this proposal was a land management proposal, no accurate, site-specific maps were made available to the public, and there were no maps for the uninventoried roadless areas. I would submit that it is not possible to meaningfully comment on a land management proposal when you do not know where the land is located.

Based upon the lack of any responses to our extension request letters and FOIA request, as well as the sheer magnitude of the proposal in Idaho, the Land Board was left with no alternative but to file a lawsuit seeking an order from the court for more information and an extension of the public comment period.

Idaho's first lawsuit was ultimately dismissed due to the fact that the federal courts lack power to hear NEPA cases before the entire NEPA process is final. However, the court's order contained a rather ominous warning to the Forest Service. Please allow me to read from the court's February 18, 2000, decision:

> While the Court has determined it lacks subject matter jurisdiction over the State's Complaint at this point, the Court would be remiss if it failed to emphasize to the Forest Service that due to the historic magnitude of the proposed action, the agency's final action will undoubtedly be subject to close judicial scrutiny. As stewards of the federal funds being expended to complete the NEPA process on the proposed action, the Forest Service should make every effort to ensure that the process is properly implemented with reasonable time frames to allow meaningful participation by the public. It appears at least arguable to this Court that the Forest Service may be inviting error and a necessary review of its actions by ignoring the objections of the Plaintiffs for a meaningful scoping process.
>
> Counsel for the Forest Service do not dispute that the purpose of the scoping process is to identify issues that are substantive and eliminate issues that are not so as to instill confidence and trust in the process. A central purpose of the NEPA process is to provide full disclosure of relevant information to allow meaningful public debate and oversight. When the areas contemplated to be roadless are not defined or shown by way of maps or otherwise illustrated, one does not have to be learned in the law to determine the public's participation will hardly be "meaningful." The State's concern over access to and management of its endowment and state forest lands that may be surrounded by national forest land are legitimate concerns of state and local governments and its citizens.
>
> The sheer magnitude of this governmental action involving 40 to 60 million acres nationwide that precipitated 500,000 comments in sixty days is the best evidence the Forest Service should proceed with caution. Time is not of the essence on an issue that has been studied for over 30 years. The public needs to be informed in order to meaningfully participate. An argument suggesting the Court is required to give due deference to agency action and expertise is likely to ring hollow unless the Forest Service does what it says it will do and that is give due consideration to new comments and issues that may be raised both during the draft EIS comment period as well as at the time the final EIS is issued.

Despite the court's warnings, the Forest Service continued to press forward with inadequate information and artificially short deadlines for public comment. The draft environmental impact statement was issued on May 10, 2000, and the public comment period was set at a meager 69 days. Once again, Idaho's requests for extension of the comment period were denied. We still had no accurate maps for inventoried areas and no maps for the uninventoried areas. The public meetings in Idaho were once again set near the end of the comment period. In a letter we received from the Forest Service, Governor Kempthorne and I were told that no maps or mapping criteria existed or were planned for the uninventoried areas.

The final environmental impact statement was issued on November 13, 2000, approximately one (1) year and one (1) month after this massive proposal was first announced. In anticipation of the adoption of the final rule, the Land Board provided additional comment and requested a face-to-face meeting with Secretary Glickman and Chief Dombeck. Once again, Idaho's concerns and the request for a face-to-face meeting were never even acknowledged.

Throughout this process, Idahoans have felt "stiffed" by the federal government. What should have been an open process with meaningful information and dialogue was fairly perceived as a sham process designed to reach a pre-determined outcome before a political deadline. Moreover, it is an insult to the elected officials and others who attempted to participate, requested basic and highly relevant information, and pled for additional time to comment on such a massive policy proposal, that we were simply ignored. This is not a good way to do business, particularly with the

states that contain the most land impacted by the roadless rule, and it is why the State of Idaho will continue to move forward in the second lawsuit it filed on January 9, 2001.

With respect to energy and mineral exploration, many Idahoans have expressed concern with the substance of the roadless rule. I know that the new Administration is working on a comprehensive national energy policy, which I commend and recognize as clearly necessary for our future energy needs and economic well being.

The roadless rule is a one-size-fits-all national policy, which constitutes a significant departure from site-specific planning and multiple use. Therefore, while Idaho is not currently an oil or gas producer, it will feel the impact of restrictions imposed on other states.

Idahoans are often asked to pay higher prices for gasoline, and we are told that the reasons are supply related, including pipeline capacity and geographical isolation. The final environmental impact statement details the adverse impacts on energy and mineral exploration and production.

In Idaho, phosphate mining in the Caribou National Forest will be substantially impacted. Table 3–68 of the FEIS estimates an annual economic impact of 10.4 million dollars in direct labor income, 38.5 million dollars in total labor income, 185 direct jobs, 976 total jobs, and 1.3 million dollars in payments to the State of Idaho.

Once again, I want to thank the subcommittees for inviting me to testify here today. Idaho will continue to press forward with its lawsuit. The State of Colorado has filed an amicus brief in support of Idaho. Alaska has also filed a lawsuit. Idaho, Colorado, and Alaska contain almost 49% of the total inventoried roadless areas subject to the roadless rule. It is my understanding that several other western states are contemplating lawsuits or preparing to file lawsuits against the roadless rule. I will keep you apprised of any significant developments during the litigation.

Mr. MCINNIS. Thank you, Mr. Lance.

We will now begin the questioning. I will initiate that.

I find it interesting in your remarks that the Forest Service denied accurate maps of the roadless areas, they denied meetings with you. My understanding is they denied information to you unless you sought it under the Freedom of Information Act and even then stalled.

First of all, are my statements accurate about the information denied to you? and what additional information was denied to you by the U.S. Forest Service?

Mr. LANCE. Mr. Chairman, Co-Chairs, that is exactly accurate. We made a request for maps so that we could have some meaningful input in terms of some of these public hearings that the governor's office and my office attended. We had about 25 hearings in Idaho and I think we attended about 20 of them.

In order to testify in a meaningful and intelligent manner we needed to know what sort of areas we were looking at. The Forest Service claimed that it had the maps on the website. However, upon closer scrutiny one determined that, in fact, no website had been developed. It was still under development.

We then made a FOIA request, which was virtually ignored, and after several telephone calls and requests for the information, we were required to file a lawsuit. That lawsuit was mooted 2 days before the scheduled hearing because the Forest Service then finally came up with these maps and the information that we had requested. It was an on-going delaying tactic. Of course, we are dealing with a large area. We are dealing with 2477 roads. Some have existing roads and some do not.

But we have tremendous impact, Mr. Chairman, and some of the impact that I think may be missed is that much of the state's land, our endowed land that we use to support some of our schools, is surrounded by Federal land. If, in fact, they make that a roadless

area surrounding our land, the only way that we can meaningfully harvest any timber off of our land to help pay for the school costs is to helicopter log, which substantially reduces the receipts to the school children of the State of Idaho. No one has satisfactorily answered the question.

At any rate, the governor and I and the other members of the Land Board also requested the face-to-face meetings with Secretary Glickman and Chief Dombeck. That was receipted for by certified mail, our request which was sent in December, and we have yet to hear a response from anyone.

But we have serious issues. We have not been trying to sandbag the Forest Service or anybody else but the bottom line is they have been totally uncooperative.

Mr. MCINNIS. I can tell you, Mr. Lance, that it is the opinion of the Chair that the Forest Service's cooperation, regardless of which side of the issue one falls on this, is absolutely necessary. It is that kind of noncooperation that creates a great deal of deep distrust. I find their behavior reprehensible and I use that word with caution but I intend to say that word because of the fact that they have that information; they know what they were doing. And I should advise you that if you have further difficulties in the future you may contact either of the Chairs and we will have them in our office and we will sit down, as well as your own congressman, because we can have that Forest Service sent in a different direction.

Mr. LANCE. Thank you.

Mr. MCINNIS. With that, I will turn questioning over to the Co-Chair and then we will go to the Ranking Member. Madam Chairman?

Mrs. CUBIN. I just have a couple of questions. They will be brief.

You discussed briefly logging with the use of helicopters. I want to know when you use energy to fly the helicopter is that an energy-efficient way to harvest the timber or is it cheaper to harvest it from the ground in the traditional ways?

Mr. LANCE. Madam Chair, Co-Chairs, obviously it is much more expensive to attempt to helicopter log and it is not as environmentally friendly in the opinion of many, but the result is that if it costs more to have a state timber harvest when you bid out a tract for selective harvesting, the bottom line is that we, the State of Idaho and the school children of the State of Idaho, are going to receive fewer net proceeds as a result of the increased costs of the logging processes.

And this is not mythical. We have a forest timber sale that has been now pending for about 3 years on Contux Creek and if you talk to the Forest Service and certain others they will tell you that there is a process that you can go through referred to as the ANILCA (Alaska National Interest Lands Conservation Act) process for accessing your way through federally managed forests to get to your own timber for purposes of harvest or energy exploration, et cetera, et cetera. We have been blocked now for 3 years from making a sale on Contux Creek as a result of NMFS and the Forest Service not allowing us access to our own land so that we can manage that forest or those trees in a very responsible manner. That is the sort of noncooperation that we have not only with the Forest Service but also National Marine Fisheries.

Mrs. CUBIN. I remember a large blow-down, I think it was in Idaho, where the Forest Service did not allow anyone to go pick up the blow-down, so it got insect-infested, and became worthless. It happens all over.

One last question. How will the roadless rule affect state fire-fighting efforts on state and private lands?

Mr. LANCE. Madam Chair, Co-Chairs, that is an excellent question. Secretary Norton recently visited what is now called the National Interagency Fire Center but referred to still in Idaho as the Boise Interagency Fire Center. She was very concerned about what has been projected in terms of the fire year that we are facing this coming year. Idaho and Oregon and Washington have 40 percent of the snowpack that we traditionally have. As a result of mismanagement or lack of management by the Forest Service, we have beetle infestations; we have a great fuel load on many of the acres that we presently have in the State of Idaho. It is going to be a tough fire year and unless or until you can access these fires that start by lightning strikes that are not followed by rain, contrary to many views held here in the East, you have lightning strikes, you have a fire start, and you have to get on that fire as quickly as possible.

The bottom line is if you do not have fire breaks, represented by roads, if you do not have access to those fire sites, which are also generally represented by roads and also air control, we are going to have a very serious problem and we anticipate a very serious problem because the undergrowth, the fuels that have been allowed to accumulate on these nationally managed forests and lands have reached an unacceptable level; the infestation by insects is just absolutely horrendous.

And I think by way of comparison, Madam Chair and Co-Chairs, it takes about 27 years to grow a saw log on federally managed lands. It takes about 21 years to grow a saw log on state-managed lands and about 17 years to grow a saw log on privately managed lands. That tells you the level of management that they have put into it so far.

Mrs. CUBIN. Thank you, Mr. Lance. I have nothing further.

Mr. MCINNIS. Mr. Kind?

Mr. KIND. Thank you, Mr. Chairman.

I want to thank the witnesses for being here today for today's hearing and your testimony. I have a written statement I would like to submit for the record without objection.

[The prepared statement of Mr. Kind follows:]

Statement of The Honorable Ron Kind, Ranking Member, Subcommittee on Energy and Mineral Resources

This afternoon we continue our review of the Clinton Administration's conservation and environmental policies by bringing into question the Forest Service roadless policy as it pertains to energy resources. While I do not debate the need for a comprehensive national energy policy, we will not achieve that goal by undoing the good work of the past Administration.

As is the case with the hard rock mining rules, CO2 emission reductions, protection of national monuments, and ANWR—the Bush Administration appears determined to undercut environmental initiatives and retreat from environmental challenges. Characterizing this policy, and the others, as "last-minute decisions" of the Clinton Administration is a thinly disguised attempt to discredit a good policy in order to rationalize jettisoning it as the oil and gas industry demands.

As the record plainly shows, the Forest Service finalized its "roadless area" initiative on January 12 of this year after three years of public debate, review, and consultation. They held more than 600 hearings nationwide and received more than 1.6 million comments. The Forest Service analyzed the effect of the policy on oil and gas activities, among other things, as part of the Environmental Impact Statement. Some may disagree with the intent of the roadless policy, but, we should not pretend that it was a snap judgement at the eleventh hour.

The roadless areas affected by this policy comprise roughly one-third of all National Forest System lands, or approximately 58.5 million acres. According to the Forest Service, although the roadless areas comprise only 2% of the land base in the continental United States, they exist within 661 of the more than 2,000 major watersheds in the nation and provide many social and ecological benefits, such as fish and wildlife habitat, clean water, hunting, fishing and outdoor recreation resources, to name but a few. On the other hand, Forest System lands play a minor role in producing oil and natural gas, generating only about four tenths of one percent of current domestic production. By comparison nationwide, Federal lands account for about 11 percent of the natural gas produced onshore while offshore the Outer Continental Shelf accounts for more than 26 percent of domestic natural gas production.

The vast majority of lands affected by the roadless policy have been open to oil and leasing for decades but the oil and gas industry has demonstrated little interest in exploiting the potential energy resources in these areas. Confirming this lack of industry interest, the Forest Service noted in its Final EIS, Minerals and Geology Specialist Report, that because of the downturn in the domestic oil and gas industry, the amount of National Forest System land under oil and gas leases dropped from about 35 million acres in the mid–1980s to 5.8 million acres in 1998.

The Forest Service presented a good overview of the rule's potential effects on oil and gas development in the final environmental impact statement for the roadless rule. However, as noted by several of our expert witnesses in their statements, the resource estimates are highly speculative and with the lack of industry activity in roadless areas over the years, cannot be considered as sufficient to warrant rescinding the roadless rule. The resource estimate of 11.3 trillion cubic feet of natural gas, for instance, is derived from academic exercises designed to estimate the location of resources and can only be considered as a hypothetical scenario.

The total oil and gas production from all National Forest System lands is less than one percent of the current national production. And the potential oil and gas resources that could be located inside inventoried roadless areas—by even the most generous estimates—are but an insignificant portion of total domestic resources. On these two facts alone, the wildlife, environment and social values protected by the rule outweigh the costs of foreclosing oil and gas drilling in those areas.

Mr. KIND. Mr. Lance, just a couple of questions before we move on. Currently Idaho has filed suit in regard to the roadless initiative; is that correct?

Mr. LANCE. Co-Chairs and Congressman, yes, that is correct.

Mr. KIND. Is Idaho currently producing any oil and gas or even coal production?

Mr. LANCE. Co-Chairs, Congressman, no, but we certainly wish that we had some and would like to explore. A few years ago certain petroleum exploration companies took out some options on some land but at the present time, to my knowledge, we have no oil or gas production occurring.

Mr. KIND. Right. And I think overall there is roughly less than 1 percent of oil and gas being produced in our Forest Service lands to begin with.

I certainly appreciate the complaints that you have raised in regard to the process and access and communication and certainly there is room for improvement in that area but my concern in regard to the roadless initiative is since it is such an insignificant amount currently being produced on our national forests, given the energy needs out there, there is so much attention placed on supply. Would you agree that as we develop a long-term energy policy

in this country we need to be looking in the areas of conservation, alternative and renewable energy sources, as well, rather than just focusing on the supply equation and also looking at demand aspects in regard to the energy needs?

Certainly the constituents of mine in Wisconsin are feeling the effects of rising energy prices, as I am sure the people in Idaho are, too, but would you agree that a more balanced approach to our long-term energy needs is what is required right now?

Mr. LANCE. Co-Chairs, Congressman, certainly renewable resources is at the top of my list. Being from farm country, we think ethanol would certainly be one of those things that should be explored and we need to get into. But may I also say that while they were building the pipeline in Alaska I was a member of the 172nd Infantry Brigade up in Alaska for three years. The argument that the caribou would be scared away by the pipeline, that the pipeline would destroy the tundra, et cetera, et cetera, et cetera—we heard all those arguments and I would be happy to take you, Congressman, up to the Denali Highway and when the caribou want to cross they will cross right in front of your car.

So I think that there is a balance here. I think you are absolutely right. I think we have to use our resources and our intelligence and sit down and discuss this matter, make sure that we apply those areas to conservation that are necessary but, at the same time, I think we need to somehow lower our dependence on foreign oil.

Mr. KIND. I am not sure what the economic impact to the State of Idaho is in regard to access to our national forests in the areas of fishing and wildlife habitat but certainly I would hope you would agree that part of managing the national forests should be conservation, the protection of fishing lands and access.

In fact, in a written statement to this Committee today Mr. Moyer of Trout Unlimited kind of broke down some of the economic benefit to conservation practices, access to hunters and fishermen on these lands. In fact, in his written statement Mr. Moyer noted, and I quote, "According to a 1999 report from the American Sports Fishing Association, 1996 fishing on the national forests produced $8.5 billion to the nation's economy. Hunting yielded $6.1 billion. Much of this value comes from trout and salmon fishing and big game hunting. Roadless area protection is tied to the long-term sustainability of these huge benefits."

Now again your process complaints aside, do you agree or disagree that roadless areas are needed in order to protect or enhance these valuable fish and wildlife habitats for outdoor sports, as well?

Mr. LANCE. Co-Chairs, Congressman, I would disagree with that statement. In order to manage you have to be able to access. You have to get back in and look at your elk herds. You have to take a look at your mule deer populations, your goats, your sheep. You have to be able to access it. Also, in order to sell a hunting license you have to give hunters and recreationalists a reasonable access to it.

The best way that we have found in Idaho to manage our larger game herds is to require that we examine the animals that are taken for diseases, nutritional things, that type of thing. And I think if you take away all of the roads in the State of Idaho in terms of fishing, as well as hunting, we are not going to be able

to provide the access that we usually do to harvest those animals in a manner that is consistent—

Mr. KIND. I would agree that access is important but we also have a backlog of multi-millions of dollars in repair and maintenance expenses that are currently going unmet in regard to the current roads that already exist. Do you have any solution of how we deal with that to improve access on the roads that already exist?

Mr. LANCE. Co-Chairs and Congressman, yes, close coordination with the locals. You all are not going to solve the problem in Idaho from Washington, D.C. here, other than spending money for the problem. The folks in Idaho have been living on these lands for generations. We know how to manage those lands and what we need is a close coordination with the Federal managers. Sixty-five percent of our land mass is presently under Federal management. We know how to manage lands. The people here in Washington don't. So we would be happy to sit down with them, have local input—we are stakeholders, as well—and come up with solutions to the problems that I know that you are concerned about, Congressman, and legitimately so.

Mr. KIND. Thank you. Thanks for your testimony.

Thank you, Mr. Chairman.

Mr. MCINNIS. Thank you.

Mr. Otter?

Mr. OTTER. Mr. Chairman, Madam Chairman, I would like to submit for the record my opening statement, as well, without objection.

[The prepared statement of Mr. Otter follows:]

Statement of The Honorable C.L. "Butch" Otter, A Representative in Congress from the State of Idaho

Chairman McInnis and Chairwoman Cubin, thank you for holding this hearing today on the devastating impacts that the previous Administration's forest roadless rule will have on our efforts to develop a comprehensive domestic energy policy.

I'm particularly pleased to see my good friend and the Attorney General for the State of Idaho—Al Lance, who's here today to explain for the committee the reasons that led to the State's lawsuit challenging the process and substance of this rule, and the potential impacts it would cause on Idaho citizens. I understand that the State of Alaska has also filed a lawsuit challenging the rule.

The previous Administration's rush to pursue unprecedented and sweeping restrictions on Forest Service and Bureau of Land Management lands—through monument designations and this roadless rule—would effectively shut off access to 9 million acres of Idaho public lands. This is land that most certainly would yield to the development of new sources of natural gas supply, rich mineral, phosphate and coal resources.

Additionally, the Forest Service estimates that 7 million acres of inventoried roadless areas are at risk of dying trees from insect infestation or diseases. The proposal could interfere with road construction and maintenance necessary to restore degraded ecosystems and reduce the risk of uncontrollable and catastrophic wildfires—like the 7 million acres that burned last summer and fall.

One of the primary concerns that I have heard about the roadless policy is that it effects 58 million acres of national forest lands, and yet only about 60 days were allowed for the citizens affected by the proposal merely to comment on the proposed rule. No extensions were permitted. No maps were provided to those interested in looking at the areas affected until well after the Forest Service's 60 day-comment period had expired.

After the Forest Service issued a 700-page impact statement, along with the proposed rule, it released the rule on November 13, 2000, and published it on January 12, 2001 so that it would go into effect without regard to other reasonable alternatives, ignoring many critical comments to the proposal, including its impact

on energy. They overstepped the National Environmental Policy Act (NEPA), ironically, in the name of protecting the environment.

Recent estimates reveal that 11.3 trillion cubic feet of natural gas could be made available from untapped American resources, including trillions of cubic feet that are now off limits because of the monuments, roadless rules, and other restrictions imposed by the previous Administration on public lands.

Coal is another source of that could be made available on federal lands. Federal lands account for almost 35 percent of total U.S. coal production. Another 30 billion tons of minable coal are sitting unused on millions of acres of Forest Service land. Over 2.5 million acres of coal bearing rocks are in inventoried roadless areas. Holders of existing federal coal leases are concerned that the roadless rules will bar them form building roads necessary to mine, and future coal leasing would be prevented altogether.

Yesterday, we held a hearing with the Forests and Forest Health subcommittee on the potential to utilize biomass for energy and other uses. I was quite intrigued by the technology that the Forest Service has already developed. If it were marketed, it could provide significant financial assistance for rural communities in Idaho, whose tax base, schools, and other basic services have been hit hard by the Forest Service's rules. Unfortunately, the Forest Service acknowledges that some 27 percent of the potential biomass materials are inaccessible due to the forest roadless policy.

And the impact of the roadless rule does not only affect access to public lands. The Forest Service acknowledges it cannot deny "reasonable access" to reserved or outstanding privately-owned minerals. Yet, private mineral rights cannot be accessed unless and until they go through stringent environmental permitting and delays that can discourage or prevent them from accessing their rights at all. Transportation across forest roadless areas impacts a great deal of private land.

That energy that could fuel American industries, businesses, homes—and help offset the millions of dollars that taxpayers are now paying for years of poor maintenance by the federal agencies in our national forests.

I notice that there are panelists today, Mr. Chairman, that will say that the roadless policy is important to protect endangered species. But the Forest Service is not the agency responsible for endangered species. That is a task that the U.S. Fish & Wildlife Service and the National Marine Fisheries Service have taken on—and their management of endangered species is a subject of another hearing. But overlooking the mission of federal agencies seems to have been a specialty of the previous Administration. They masterminded the Interior Columbia Basin Ecosystem Management Plan and other top-down bureaucratic processes that would eliminate years of local planning efforts to properly manage our forests in Idaho, Washington, Oregon, and Montana.

While we must all be sensitive to the environment we all live in, I cannot agree that preventing access to areas that would help maintain healthy forests and eliminate destructive wildfires will protect species. In fact, it has already done exactly the opposite. Entire watersheds and land where endangered species live were destroyed by fires last year—fires that could have been prevented through better management and access. Last year, an enormous amount of silt and sediment from the wildfires fell into the tributaries and waters where fish swim, eat, and live. Undoubtedly, deer, elk, even lynx and wolves perished in the millions of acres of hot fires that rages for months last year.

On an issue unrelated to the roadless rule, but pertinent to the energy crisis we face in the Pacific Northwest and California, I think its time for a reality check. We cannot rely solely on conservation or marginal proposals to use solar or wind power generation. We need to continue exploring and increasing clean, renewable sources of energy—including hydroelectric power.

Trout Unlimited and the Wilderness Society are represented here today by witnesses that argue against selective timber harvesting of the forests, and against the increased use of any other source of fuel—coal, natural gas, or oil. They also are on record for endorsing a proposal to tear out four hydroelectric dams that produce up to 3,000 megawatts of power at their peak—enough to power the City of Seattle three times over.

Replacing the clean electricity generated by the dams with the next cheapest source—natural gas—would take years to implement, cost millions of dollars per year, and would further exacerbate the growing demand for natural gas that is already there. Instead, we should support efforts to swiftly relicense these dams, and authorize access to public lands to maximize their transmission capability.

I look forward to working with the committee, to explore common sense proposals to unlock the abundant energy resources available on the millions of acres of public lands and to reverse unwise directives such as the roadless regulations, that prevent

access to those who could untap resources, reduce the risk of forest fires, and to ease our nation's energy crisis.

Mr. OTTER. Hearing none, I would like to follow up with a few of the questions or at least one of the questions that Mr. Kind brought up.

Mr. MCINNIS. Mr. Otter, may I interrupt for a second? I made a procedural mistake. I should have recognized Mr. Inslee as the Ranking Member. I apologize.

Mr. INSLEE. No, I think the gentleman's on a roll. Let's let him keep going.

Mr. MCINNIS. I apologize.

Mr. OTTER. Thank you for that compliment. I appreciate it.

Mr. MCINNIS. Mr. Otter?

Mr. OTTER. Anyway, Al, much was made of whether or not we have any energy exploration going on in Idaho or proven. Is it not a fact that some of the oldest phosphate beds known to man are actually in the Southeastern Idaho and that phosphate then is made into fertilizer and that fertilizer then helps corn and other farm products grow, which we make ethanol and other energy products out of?

Mr. LANCE. Co-Chairs, Congressman Otter, Butch, you are absolutely right. In the heart of the Caribou National Forest in Southeastern Idaho we have some of the richest phosphate deposits in the United States that are presently being extracted for purposes of use in agricultural pursuits, et cetera, et cetera. And yes, you can make by logical extension, the argument that those products, in fact, could be used as a biomass to make ethanol and so forth and so on but other than that, I am unaware, Butch, of the energy relationship that we might come up with, although over by Sand Hollow a few years ago they did give out some options on some exploration for oil but other than that and the phosphates.

But Idaho is a large state and virtually unexplored in certain areas, so we may be sitting on some natural gas that we are unaware of.

Mr. OTTER. Thank you for that response, Al.

I would remind all the members of this Committee that it was only two short days ago that we had substantial testimony that was offered before this Committee on biomass and indeed how much energy could come from the forest and forest floor and would result in many kilowatts of potential electricity, needed electricity, that could be created. And with 21.5 million acres of forest in Idaho, along with 14 million acres of BLM ground, there is much fuel stock there that could leave a fire-defensible forest, as well as fire-defensible public lands and still yield an awful lot of energy.

Al, I am very interested in the impact that the roadless area has had on Idaho's schoolchildren and your comment relative to the endowment plans. For the benefit of a lot of people that are east of the Mississippi River and probably do not experience this in their state, these tremendous land grabs that go on by the Federal Government constantly, is it not true that sections 16 and 36 out of every township—and every township is roughly six square miles or 23,040 acres—out of every township the State of Idaho was granted for its public schools an endowment fund of 1,280 acres?

Mr. LANCE. Madam Chair, Co-Chairs, Congressman Otter, yes, that is absolutely correct. Idaho presently has about 2.5 million acres still in inventory that is under the management of the Land Board and those proceeds, which are grazing lands, agricultural lands, some mining, not too many mining lands, and timber lands, the proceeds from the management of those lands are used for the endowed institutions, which primarily are the educational institutions in the State of Idaho.

And parenthetically, let me add that those school districts that are heavily dependent upon the timber industry are hurting at the present time because we have shut down several timber mills, as you are well aware, as a result of the unavailability of timber to keep those folks working and to pay their taxes to keep those schools open. But you are absolutely right, Butch, but we are down to about 2.5 million acres of state-endowed lands.

Mr. OTTER. Very quickly, Al. Yes or no on these next two because I think they are important.

Is it not true that the private sector holdings in the timber industry—for instance, Weyerhauser, Boise Cascade, Potlatch, Plum Creek, many of the other private holdings—pay on the average to the State of Idaho and to the counties I should say $8.82 an acre for timbered lands a year?

Mr. LANCE. Mr. Chairman, yes.

Mr. OTTER. Is it not also a fact that of the total Federal receipts for 21.5 million acres of Idaho forest lands we receive less than 80 cents in the county for support of publics schools, fire, police, et cetera?

Mr. LANCE. Co-Chairs, Congressman, yes, that is true.

Mr. OTTER. And is it not a fact that most of the receipts that we formerly received came only when we were allowed to use those timber resources on a sustainable yield, sustainable cut for the supplies for our logging mills?

Mr. LANCE. Co-Chairs, Congressman Otter, that is correct, yes.

Mr. OTTER. Thank you, Mr. Chairman, Madam Chairman, my time is up.

Mr. MCINNIS. Thank you, Mr. Otter.

Mr. Inslee?

Mr. INSLEE. Thank you, Mr. Chairman.

Mr. Lance, I am really glad you are here today because I think all of us know how beautiful Idaho is and every American citizen in this room has some interest in this policy because we all have a stake in Idaho, even if we do not live there.

I would like you to help educate us a little bit about the status of this lawsuit. Let me tell you, I have some very, very deep concerns about it because it is my understanding that the attorney general of the United States promised the American people in his confirmation hearing that if indeed the United States Senate confirmed him he would enforce the law of the United States of America when it came to protecting and defending this roadless policy.

I heard him say that, the press heard him say that and I have heard that in this lawsuit, at best, he has delayed and at worst, he has looked for a way for the law to be abrogated and that really disturbs me to think that an attorney general who has told the U.S. Senate and the American people they are going to defend the

law apparently is doing something, what I used to call, and I used to be an old trial lawyer, called taking a dive and I am very concerned about that and I would like you to address, in fact, what the United States government has done in that lawsuit. Are they defending this rule? Are they aggressively defending it or are they doing something else?

Mr. LANCE. Co-Chairs, Congressman, thank you for the question.

The plaintiffs are the Land Board, the State of Idaho, the governor and the attorney general of the State of Idaho. We have two Idaho counties that are also plaintiffs in that action, the Kootenai, one of our tribes up in Northern Idaho. And on the defense side you not only have the Federal Government and the Forest Service but you also have a variety of intervenors. Those intervenors were present and made argument last Friday in Boise, Idaho on behalf of the Forest Service. The Federal Government was there and made argument on behalf of the Forest Service and we, on the other side, made our arguments before Judge Lodge.

He presently has it under advisement as to whether or not he is going to grant us the injunction that we sought, the State of Idaho and the plaintiffs. Of course, the intervenors and the Federal Government have defended against the granting of that injunction.

I would say to you, sir, that the intervenors on behalf of the Federal Government and the Forest Service are well represented. They have made their arguments. I am talking about the conservation groups and so forth and so on. They, in conjunction with the Federal Government, have gone all the way.

If we had a deal, so to speak, with the Federal Government, Congressman, we would not have had to spend my resources last Friday in going before Judge Lodge and making this argument, taking some substantial risk relative to the overall development of the case, if you will. But we had no deal. We went forward. We made our best arguments and we would have made those arguments whether or not it was Janet Reno, the attorney general of the United States, or John Ashcroft as the attorney general of the United States. We have a case to make and we are going to make it regardless of who is in the White House, sir.

Mr. INSLEE. And could you tell us what the pleadings were that were first filed by the attorney general of the United States? Did he, in fact, file a pleading on behalf of the United States which asserted that these rules were appropriately adopted and that they should be implemented and that your case should be dismissed with prejudice? Did he do that, sir?

Mr. LANCE. Mr. Chairman, Congressman, the first thing that happened was that President Bush suspended the implementation of the rules until May 12 so as to give the administration, as I understand it, the opportunity to look at it. The next thing that I was involved with was a meeting with the Department of Justice and representatives from the Department of Agriculture. The same people, you understand, were with the Department of Justice that were under the present administration as were, in fact, under the previous administration. So we were dealing with virtually the same people. And until last Friday Michael Dombeck was also the Chief of the Forest Service until his resignation.

So to answer your question, the bottom line is the administration, as I understand it, is taking a look at these rules and some of our complaints and some of our problems and we would hope that someone would listen to us in terms of the due process violations that we perceive transpired during the course of the hearing.

Mr. INSLEE. So I take it your answer, in a short word, is no, in fact, the attorney general did not do that, even though he told the U.S. Senate that he would do that. Is that a fair statement?

Mr. LANCE. Co-Chairs, Congressman, no, I do not think that that is a fair statement. The United States government showed up. They made their arguments, along with the intervenors, against our position. I think that is opposition. Whether or not one would characterize it as being in violation of Attorney General Ashcroft's oath, I am not prepared to say, sir.

Mr. INSLEE. I really truly want to understand what happened in the lawsuit because I have been asked myself, so I do want to understand it.

My understanding is, and I used to practice a little law in my day, that when you file a pleading you state what your position is. My understanding is that the attorney general had the opportunity to come in and follow his oath to the U.S. Senate and file a document that said that the position of the United States of America was that this policy was appropriately adopted and should be implemented and my understanding is he did not do that. Am I correct or not?

Mr. LANCE. Congressman, as I understand your question, and Chairs, no, they were there. They argued against our position.

Mr. INSLEE. The answer is no, is that correct?

Mr. LANCE. Last Friday they were there, they made their arguments against our position. So if they wanted to stipulate to it and give us what we wanted, which would have been a lot easier, we would have much preferred that, sir, but they were there arguing against our position in court in Boise last Friday.

Mr. INSLEE. Thank you, Mr. Lance.

Mr. LANCE. Thank you, sir.

Mr. MCINNIS. Mr. Lance, I am going to save you a little breath. You do not always have to address the Co-Chairs and the Committee. We appreciate your formalness but it is not necessary.

To get us back on track I am going to recognize Mr. Rahall. Mr. Rahall?

Mr. RAHALL. Attorney General, you may have heard my opening statement. I mentioned the 380,000 miles of forest roads. There is an $8.4 billion backlog of maintenance needs just to repair what is already there.

Mr. LANCE. Yes.

Mr. RAHALL. Only 20 percent of what the Forest Service needs on a yearly basis is being appropriated to help maintain that backlog.

Now I appreciate your comment about us people here in Washington not knowing how to manage these lands and my colleague from Idaho trying to tell us east of the Mississippi what life is like out West but I am just wondering if I am missing something here. With that backlog and with the lack of funds to adequately maintain what is there now, and by the way, you mentioned the high

gasoline prices in your State of Idaho, the high costs you already face. You are the fourth highest in the nation in state gas tax and there is nothing wrong with that; my state is high in state gasoline tax, as well, but we do not go blaming it on us people here in Washington. And we are glad to see that because we use it to match more Federal dollars and build more highways.

But anyway, where are you proposing then the money comes from? Is the State of Idaho willing to belly up to the bar, so to speak, to pay for this? Do you have industry commitments of which we are unaware, that are willing to help maintain what we have now?

Mr. LANCE. Chairs, Congressman, first of all, I have been to your beautiful State of West Virginia on several occasions.

Mr. RAHALL. I have been to your beautiful state of Ohio—I mean Idaho, sorry.

Mr. LANCE. I was originally born in Ohio but that is a whole long story.

You know, the common misperception, and I understand that the needs are great in terms of what is perceived to be normal and routine maintenance of roadways but we are not talking interstate highways here. We are just talking about roadways, generally speaking logging roads that have been cut in the side of the mountain to access a timber sale and then once the timber has been extracted in a selective and environmentally responsible manner, that road is there.

Now the only maintenance that is necessary in some instances is to ensure that it does not pollute the stream and erode, quite simply. That can be done in several manners. Number one, you can close access to that logging road. The road is there as a fire break. It is there in the event of an emergency. And assuming that you have the erosion under control it does not take anything.

The bottom line, Congressman, I think is that we need a Forest Service and a Federal Government that we can sit down with and we can compare our needs.

Now industry, certainly when we have a timber sale that is anticipated on state lands, we take into account the value added to our lands when we ask a contractor to come in and carve in a road and then to put in the culverts and to take care of the road in a responsible manner. That is factored into our timber sales price and I suspect the Forest Service ought to take a look at that but the bottom line, I think, is that we all need to sit down together and find out what the State of Idaho is willing to do, if we have sales, what the industry might be prepared to do in terms of a sale and a credit for the improvements that they may make to the land, and what the Federal Government is willing to do. Right now we do not have a place at the table.

Mr. RAHALL. I am aware of that process that you have just described. I am just not aware of any financial responsibility or anywhere where the state or the industry has kicked in to help once those extractive industries have gotten their payloads out of the area. There are still some costs involved in that process. You say you do not have the ability to sit down at the table. Perhaps if you sat down at the table without the Federal Government involved and then came to us with a proposal; is that not a proper scenario?

Mr. LANCE. Mr. Chairman, Co-Chairs, Congressman, yes, I think that it is. I think that if we, in fact, Idaho has what we call a process that we have spent a lot of time and money on dealing with the joint management of Federal lands. We have identified six projects. This has been run through the committee that was funded by the Department of Lands and the Land Board through the University of Idaho. We have identified six projects to sit down with the Federal Government and jointly manage this, which would require money on our part but it would also require a willingness on the part of the Forest Service and others to sit down and discuss our proposals. Thus far we have had no cooperation in terms of sitting down and looking at these proposals, finding out how to manage these six tracts of land that we have identified and how we are going to pay for the roads and how we are going to maintain them, sir.

Mr. RAHALL. Thank you, Mr. Chairman.

Mr. MCINNIS. Mr. Simpson?

Mr. SIMPSON Thank you, Mr. Chairman.

If you wonder why General Lance always responds to the Chairman first, to the Committee and then the one asking the question, the Idaho Legislature, that is the way it is always done. He served there for a number of years with me and has testified before the Legislature many, many times and consequently you get in the habit of doing that. It is just the way we show respect in Idaho.

There are some interesting things that have been brought up during this and I appreciated the opening statements of the Co-Chairs and also of the gentleman from West Virginia. He mentioned that we had an $8.4 billion backlog in roads in our national forests currently and we were not doing our best to address those and that because of those, we were damaging critical fish and wildlife habitat, and so forth.

You know, last year we had legislation called CARA and many of us suggested that we ought to use that money, before we start acquiring more land, to address the backlog needs in our national forests and national parks. But, of course, we could not get enough support for that but that is one of the ways we could have addressed some of that backlog because I agree with you that there is a problem there.

But I can tell you another thing. We did not in any of these roads damage as much critical fish and wildlife habitat as the wildfires that occurred last year in Idaho. And the fish habitat that is being destroyed today as water runs off that area and into the streams and covers the beds is doing more damage than any roads have ever done. And a large part of the reason those fires occurred is because we have not had active management of those lands over the last several years and the roadless moratorium that we are talking about today just means that we will not have more active management because you will not be able to get in there and do it, or it will make it so expensive that you cannot actively get in there to do it.

Mr. RAHALL. Would you yield? You mentioned my name.

Mr. SIMPSON That I would.

Mr. RAHALL. Just on the CARA issue, I supported that legislation, as well, and I suggest you go talk to the leadership that con-

trols the Appropriations Committee here. That is where that problem lies. My party does not control the leadership here.

And I would say as far as the fire issue, on those areas that are not opened up, I am not sure what there is to control as far as fires that may occur.

Mr. SIMPSON Well, reclaiming my time, I appreciate the gentleman's comments but last year what we tried to do is make sure that that money used in CARA was used to address the backlog instead of all the new programs that were in there. I voted against CARA because of that so that's the reason that I opposed it.

Let me pose a hypothetical and I wish Mr. Inslee was still here. You are the attorney general for the State of Idaho. Your job is to defend the State of Idaho and the people of the State of Idaho. Let us say that an agency of the State of Idaho had proposed a rule and in proposing that rule they had violated a number of Idaho statutes. Would you, as the attorney general, then feel obligated to defend the rule implemented by that agency?

Mr. LANCE. Congressman Simpson, you would examine it, you would find out how serious the violations were. If it were a violation of due process, I think as an officer of the court you would have an obligation to make that known to the court that the rules had been violated and that your agency probably stepped across the line and maybe they ought to go back to the drawing board and start again and do it by the numbers.

Mr. SIMPSON Considering that the past Administration denied all Freedom of Information Act requests and all cooperating agency status applications filed by the affected states, considering also that accurate maps were not made available during the public comment period, in violation of the Administrative Procedures Act, considering that the administration developed the policy in lock-step coordination with a handful of national environmental groups and in conjunction with their multi-million-dollar roadless campaign, a likely violation of the Federal Advisory Committee Act, considering that no small business or small government analysis was done to comply with the Regulatory Flexibility Act, considering that many forest plans will have to be revised as a result of this rule, violating the National Forest Management Act, considering that it usually takes the Forest Service two or 3 years to do a legally defensible EIS for a timber sale covering only 300 acres yet it took the administration only 1 year to do a single massive EIS covering over 5,800 million acres, do you think the attorney general can defend this? I know that is a tough question.

Mr. LANCE. Congressman Simpson, let me just say that I think the new Administration would have preferred to have more time to include the attorney general and the attorneys that represented the Forest Service and others. They would have preferred to have a lot more time to study this to get to the bottom of it.

The bottom line is they were new. They walked in, they offered a defense because we felt it would have been a violation of the court's order to stipulate to the continuance to give them that time that would have been required. All I can tell you, sir, is that they were there, they opposed our position and they were doing their job and probably if circumstances were such, I would have been very willing to give them additional time to study the issue and study

the problem. But the bottom line is fire season is going to be starting in Idaho, as you both are aware, very soon and we do not have time to have people tell us that we cannot go to put out the fires that are being caused as a result of the years of neglect in our national forests.

Mr. SIMPSON In your opinion what is the likelihood of catastrophic fires occurring again this year?

Mr. LANCE. I think, Congressman, this is going to be the first year we are going to have back to back record fires. Last year was a terrible fire year. We had 1.2 million acres destroyed by fire last year. We still have about 895,000 acres of good timber just laying out there and we cannot get at it because the Forest Service will not cooperate in terms of some sort of salvage effort. As a consequence, we are just wasting that timber. You talk about wasting energy. You are talking about many, many boardfeet laying out there that we cannot get at because the Forest Service is not cooperative.

This year is going to be a tremendous fire year, a very bad fire year, not only in the State of Idaho but from what I predict and what I see, the states of Washington and Oregon, as well, sir.

Mr. SIMPSON Thank you.

Mr. MCINNIS. Mr. Udall?

Mr. UDALL. Thank you, Mr. Chairman.

General Lance, good to see you here today, to be reunited with you again from the old days. His two colleagues here did not say but he is also the national commander of the American Legion, which I think is a real honor that they have bestowed upon him, so congratulations on that. I know that happened near the end of your AG term there.

General Lance, you have talked about imported oil and dependence on imported oil and how we should get our way out of that situation. You know, we have grown dramatically in terms of our dependence. In the 1960's we imported about 20 percent of our oil. We are headed toward 60 percent now. We are not doing anything to change that direction. We are heavily dependent on imported oil and 55 percent of that imported oil is from the Middle East, which is a very volatile region.

When you look at the numbers here, especially in Idaho, of oil that we are going to get out of roadless areas, you are not here to tell us that we are going to solve our energy problem with oil that we are going to get off roadless areas in Idaho, are you?

Mr. LANCE. Congressman, Tom, good to see you again, too. Absolutely not. To my knowledge, as I have testified, we do not have any oil unless there is some that I am unaware of. We have a little potential for natural gas in the Targhee National Forest.

Tom, when it comes right down to the issue of energy exploration I am here just to say that the process was not, in fact, followed. The NEPA processes were not followed. The governor of the State of Idaho and the attorney general of the State of Idaho were given 3 minutes to testify and that was the maximum. Testimony from people who work in the forest, took off time from their jobs and away from their families to come and stand in line to testify were given the same weight as people who sat in their offices and sent in e-mails. That is just wrong, Tom. I know you and I may have

some disagreements in terms of the ultimate result but I think we both have a commitment to the process and that is why we filed the lawsuit.

Now if the energy exploration business piggybacks on our lawsuit when it comes to the process and sitting down and talking about these things and coming up with some type of process that is acceptable to the American people and to the affected states, so be it, but I cannot comment too much on the energy thing, Tom. Unfortunately, Idaho is not a large energy-producing state.

Mr. UDALL. Thank you. The issue that you have raised of the commenting and the process that was followed, that is clearly one where many other individuals had an opportunity to comment and I think they took comments in the time period. 1.6 million people stepped forward and got their comments in and had the ability to do it.

So I do not think you are suggesting that a lot of other Americans did not have the opportunity to look at the roadless policy and comment in their respective state about it, are you?

Mr. LANCE. Congressman, I think that there were a lot of form letters being filled out, a lot of postcards, a lot of e-mails. And I think, Tom, to be real honest with you, there is a difference between somebody who takes time off of the job to go to a Federal public hearing and waiting an hour and a half and he works in the sawmill and he has kids to support. He or she is there to testify eyeball to eyeball with these folks and I think there is a tremendous difference between that person's testimony and the sacrifice they made and then somebody who fills out a form letter and sends it into the Forest Service. That is my point.

Mrs. CUBIN. Will the gentleman yield?

Mr. UDALL. I just want to deal with one more thing and then I would be happy to yield.

You mentioned in your testimony about the school children. The last time around we had a lot of testimony in front of the Resources Committee dealing with timber-dependent communities and that money in terms of the schools and we, in fact, one of the bipartisan things we did out of the Resources Committee was to pass a piece of legislation—I forget exactly what it was called but it was the county payments legislation. What we did was we said under the old system, because you had these cycles of boom and bust, that you could make a choice. You could go with the old system, with the cycles of boom and bust, or you could choose a formula under the new system and that formula many times was higher than under the old system.

So we tried to deal, I think, with the situation you are talking about. I do not know how familiar you are with that law but I think we did a good job of trying to disconnect the two, make sure that we have healthy forests on the one hand and that states could also choose on the other hand their method of payment so that you did not have this connection driving the forest policy.

And I guess since the time is out I would just say for the record that piece of legislation did pass, I believe it passed on a large bipartisan basis and it was an attempt to really tackle the issue that you are talking about.

Thank you very much, Mr. Chairman, and I would yield to you at this time.

Mrs. CUBIN. That is okay; you do not have any time left.

Mr. Lance, did you want to say anything?

Mr. LANCE. If I may, Madam Chair, Tom, you are absolutely right. I think that was a step in the right direction and I applaud those of you who studied that issue. But you are talking about the PILT payments, Tom, what we used to call the payment in lieu of taxes payments. That is a little different issue than land that is owned by the State of Idaho and you cannot access your land for purposes of harvest because there is a roadless policy of the lands of the Federal Government that surround you. That is a little different issue, Tom, but I—

Mr. UDALL. In fact, we are not talking PILT payments. We are talking county school payments and we did legislation on that and states can now make a choice. I do not want to argue with you. My time is up. I am running over here and maybe on the next round we will have an opportunity to go through it again.

Pleasure to have you here.

Mr. LANCE. Thank you, Tom.

Mr. UDALL. I would like to carve out some time for our Chairman here. You have the prerogative. You have all the time over there, anyway.

Mrs. CUBIN. I just do want to make a point about the process to counter what was said. Yes, there was a lot of public input. There were hundreds of thousands if not millions of statements that were submitted but also the rule was put in place before it was physically possible for the Forest Service to have considered all of those comments.

I know in the State of Wyoming there was like 24 hours left and thousands and thousands of statements that needed to be regarded and the point is, Tom, that the statements were made but they were not included in the decision-making process.

The Chair now recognizes Mr. Flake.

Mr. FLAKE. No questions.

Mrs. CUBIN. Mrs. McCollum?

Ms. MCCOLLUM. Thank you, Madam Chair.

Mr. Lance, when you were talking about the mills closing, I am from Minnesota so we are not identical but we are on that border with Canada and I am hearing from a lot of the folks in my part of the world that part of the reason why our mills are not successful has to do with what is happening with Canadian timber.

Is that a fair statement, that that played a factor in what you were describing as closing the mills and it was not all the Forest Service?

Mr. LANCE. Madam Chair, Congressman, yes, absolutely, there is no question about it. The Canadians are exporting large quantities of lumber. That is a factor in terms of the mill closures. There is no question about that.

Ms. MCCOLLUM. Mr. Lance, I appreciate you clarifying that because had I not brought that up you would have thought that only the factor that you mentioned was the only reason why your lumber people are suffering.

Could you tell me, has your state, as my state, had any discussions about closing roads, trading roads back and forth between the Federal Government? Any where there is state forest, national forest, where they are parallel, doing any land swaps, road swaps, any of that kind of stuff?

Mr. LANCE. Congressman, yes, we swap lands, state lands with Federal lands, on a fairly frequent basis in the State of Idaho, generally a block-up. If you have in-holdings here and there, what you are trying to do is block it up so that we have a management unit and the Federal Government ends up with a manageable unit. Sometimes those include roads and rights-of-way and so forth and so on.

The problem that we have that I do not know if you have in Minnesota is 2477 roads. We have these historic roads that were established sometime ago and we still are trying to sort out where the 2477 roads are, who owns them and who has the right to use them. So that kind of complicates some of those transfers that you would suggest.

Ms. MCCOLLUM. Mr. Lance, could you tell me where your school trust lands are isolated, as ours are in Minnesota, has the state had a dialogue going on to access those lands, to get the dollars for the schools? Have they had a long dialogue going on identifying records of conversations back and forth between the Forest Service to access those spots of school trust land? Have they been working on this for a while?

Mr. LANCE. Well, Congressman, the example that I used is Contux Creek, state land. We tried to do a timber sale. In fact, we did the timber sale. It is surrounded by Federal lands. We were in the process of working with the Forest Service. Intervenors, like conservation groups, filed a variety of lawsuits. NMFS came in and wanted another environmental impact statement so it has been about 3 years and our timber is still there and we have not been able to harvest it.

Ms. MCCOLLUM. Mr. Lance, that was not my question.

Mr. LANCE. All right.

Ms. MCCOLLUM. My question was are you aware if your state has had an on-going dialogue about trading lands back and forth, making sure that road access, as roads were being developed by the state and by the Federal Government or roads in Federal lands be kept up, upgraded so that you could have access to your school trust funds lands? Have you been doing that?

Mr. LANCE. Madam, Congressman, I am of the opinion that yes, we attempt to do that on a fairly frequent basis. As I indicated earlier, we do, in fact, trade lands with the Federal Government and agencies of the Federal Government on a fairly frequent basis. To identify all of the parcels of state lands and to sit down and attempt then to identify all of the roads or the 2477 roads or whatever else, I think would be somewhat difficult but we are certainly willing to do as you suggest, to sit down and to try to cooperatively manage many of these roads and lands.

Ms. MCCOLLUM. And Madam Chair, Mr. Lance, I am very disappointed that you did not get access to maps when you asked for them so I want to make that perfectly clear. I am sure we had some of the same things going on in Minnesota but we had maps

available to us to figure out what was going on. Were you totally clueless as to what this was going to look like when the roadless policy came out or did you have some maps, some idea or were you really totally out there without a clue what was going to happen?

Mr. LANCE. Congressman, there are two types of roads covered by the roadless proposal, two types of lands, one of which is the inventoried roadless and one is the uninventoried roadless. No one knows what the uninventoried roadless is. We know that the inventoried roadless in Idaho is 9.5 million acres. No one can tell us what the uninventoried size is. It has been projected that maybe that is another 4.5 million acres. On the uninventoried, we are totally clueless. We do not know.

Ms. MCCOLLUM. Thank you.

Mrs. CUBIN. The Chair now recognizes Mr. Holt.

Mr. HOLT. No questions for this witness at this time. Thank you, Madam Chair.

Mrs. CUBIN. Well, Mr. Lance, we certainly thank you for your testimony, thank you for the answers to the questions and we really appreciate your being here.

Also, Mr. Orton, we appreciate your being here. You were just as cute as could be sitting there. Don't think we do not appreciate that.

Mr. LANCE. Thank you, Madam Chair.

Mrs. CUBIN. Okay, never mind. You are not that cute.

Thank you very much. The panel is now dismissed.

The Chair would like to now call for panel two: Mr. Randy Phillips, Deputy Chief of Programs and Legislation for the USDA Forest Service; Mr. Jeffrey Eppink, Vice President for Advanced Resources, International; Mr. Steve Moyer, Vice President of Conservation Programs for Trout Unlimited; Mr. Greg Schaefer, Director of External Affairs for the Western Region for Arch Coal, Incorporated and, I might add, a personal dear friend of mine—thank you, Greg, for being here—and Mr. Pete Morton, Resource Economist for The Wilderness Society.

Let me remind the witnesses that under our Committee rules you must limit your oral statements to five minutes but your entire statement will appear in the record.

I now recognize Mr. Phillips for his five minutes of testimony.

STATEMENT OF RANDY PHILLIPS, DEPUTY CHIEF, PROGRAMS AND LEGISLATION, USDA FOREST SERVICE

Mr. PHILLIPS. Thank you, Madam Chair.

I am Randy Phillips, Deputy Chief of Programs and Legislation for the U.S. Forest Service. I am also accompanied by Mr. Larry Gadt, who is the director of our minerals and energy program for the Forest Service.

I am here today to discus with you the effects of the roadless rule on energy production based on the analysis in the Roadless Area Conservation Final Environmental Impact Statement that was released on November 9 of last year and the final rule that was published on January 12 of this year.

As you know, on January 20, 2001 the Assistant to the President and White House Chief of Staff issued a memorandum to agencies to request that all new rules and regulations not yet in effect be

delayed for 60 days to give the administration time to review the rules. In accordance with that direction, the secretary delayed the effective date of the Roadless Area Conservation final rule from March 13 of this year until May 12, 2001.

With the roadless rule currently under review by the Department of Agriculture, my comments today will be limited to the effects documented in the final environmental impact statement and the final regulatory impact analysis that was prepared in conjunction with the final rule.

The roadless rule would generally prohibit road construction and reconstruction in inventoried roadless areas on about 58.5 million acres of national forest and grasslands. The prohibition of road construction and reconstruction is anticipated to have some impact on leasable energy minerals. The final rule would not affect road construction and reconstruction providing access to and development within existing mineral lease boundaries or access needed for existing rights, such as private or state-owned mineral deposits. The prohibitions would likely prevent expansion of existing mineral lease areas into adjacent inventoried roadless areas or exploration and development of new mineral leases except in situations where development can be done without road construction.

The final roadless rule could affect exploration for or development of known coal reserves on approximately 47,400 acres in Colorado alone not currently leased in inventoried roadless areas. These reserves are estimated at between 237 million and 1.3 billion tons of coal near or adjacent to active mines. In addition, there are over 2.5 million acres of inventoried roadless areas with varying levels of potential to contain coal resources suitable for commercial development. There may also be other coal resources in inventoried roadless areas. However, the extent of the resources is not known at this time.

The mining of coal from inventoried roadless areas is not extensive but there are active mines on the Grand Mesa, Uncompahgre and Gunnison National Forests in Colorado and the Manti-Lasal National Forest in Utah. On the Grand Mesa, Uncompahgre and Gunnison National Forests, Arch Coal is interested in expansion into a contiguous inventoried roadless area.

Although the mine is an underground operation, expansion may require road access for exploration and development drilling and construction of ventilation shafts. If production cannot be expanded into inventoried roadless areas, the mine could close within two to 5 years when current reserves are exhausted. Potential effects from closure of this mine could include the loss of 361 direct jobs and affect 2,119 total jobs. Two other operating mines adjacent to roadless areas on the GMUG could also be affected. Together these two mines produce about 9 million tons per year and employ 368 people. There are also three tracts with known recoverable coal reserves in the Manti-Lasal National Forest that currently are not under lease.

Currently over 6 million acres of National Forest System land is under lease for oil and gas. This includes approximately 759,000 acres of inventoried roadless areas considered to have high oil and gas potential under lease. The areas currently under lease will not be materially affected by the roadless rule.

Near the completion of the Roadless Area Conservation Final Environmental Impact Statement the Department of Energy, DOE, raised additional concerns about the potential impacts on production of coal, oil and gas resources. After being informed about these concerns the Forest Service evaluated the information provided by DOE in accordance with agency procedures under the National Environmental Policy Act for new information. The agency concluded that there was no change in the magnitude of the effects, as disclosed in the FEIS. The DOE information was included in the regulatory impact analysis.

Using information from the Department of Energy, an estimated 11.3 trillion cubic feet of natural gas and 550 million barrels of oil could potentially underlie inventoried roadless areas. They also estimate that between 63 percent and 78 percent of these potential reserves may be economically recoverable.

In addition, on the Los Padres National Forest in California the prohibition of road construction or reconstruction in inventoried roadless areas could affect exploration and possible development.

In summary, while the roadless rule does not impact existing mineral leases and outstanding rights it could impact expansion of existing leases and exploration and development of new mineral leases on National Forest System lands. Thank you. This concludes my statement. I would be happy to answer any questions.

[The prepared statement of Mr. Phillips follows:]

Statement of Randle G. Phillips, Deputy Chief for Programs and Legislation, Forest Service, U.S. Department of Agriculture

Chairman Cubin, Chairman Mcinnis and Members of the Subcommittees:

Thank you for the opportunity to appear before you today to talk about the potential impacts of the roadless rule on energy mineral leasing from National Forest System lands. I am Randy Phillips, Deputy Chief for Programs and Legislation, and with me today is Larry Gadt, Director for Minerals and Geology Management of the Forest Service. I am here today to discuss with you the effects of the roadless rule based on the analysis in the Roadless Area Conservation Final Environmental Impact Statement (FEIS) that was released on November 9, 2000 and the final rule that was published on January 12, 2001.

As you know, on January 20,2001, the Assistant to the President and White House Chief of Staff issued a memorandum to agencies requesting that all new rules and regulations not yet in effect be delayed 60-days to give the Administration time to review the rules. In accordance with that direction, the Secretary delayed the effective date of the Roadless Area Conservation final rule from March 13, 2001, until May 12, 2001.

The roadless rule is currently under review by the Department of Agriculture, so my comments today will be limited to the effects documented in the FEIS and the final regulatory impact analysis that was prepared in conjunction with the final rule.

In brief, the roadless rule would generally prohibit road construction and reconstruction in inventoried roadless areas (IRAs) on 58.5 million acres of national forests and grasslands. The prohibition of road construction and reconstruction is anticipated to have some impact on leasable energy minerals. The final rule would not affect road construction and reconstruction providing access to and development within existing mineral lease boundaries or access needed for existing rights, such as private or State owned mineral deposits. The prohibitions would likely prevent expansion of existing mineral lease areas into adjacent inventoried roadless areas or exploration and development of new mineral leases except in situations where development can be done without road construction.

Before I talk about the impacts of the rule on energy mineral leasing, I first want to briefly discuss energy mineral leasing on National Forest System lands.

BACKGROUND

Leasable mineral resources are those mineral resources that can be explored for and developed under one of several mineral-leasing acts. They include energy resources such as oil, gas, coal, and geothermal.

Exploration and development of oil, gas, coal, and geothermal resources are discretionary activities, meaning that leasing of them may or may not be allowed. The Bureau of Land Management (BLM) has the authority to lease minerals on National Forest System lands; however, they may only be leased subject to Forest Service concurrence.

Environmental impact statements are generally prepared before the issuance of mineral leases in inventoried roadless areas. The effects of any future lease exploration or development are also addressed in subsequent environmental analysis.

EFFECTS OF THE ROADLESS RULE

Locatable mineral access is a right granted by statute and therefore not materially affected by the road prohibition. Saleable minerals are subject to the road prohibition, and therefore generally eliminated as a permissible activity within inventoried roadless. However, the economic effect of eliminating saleable minerals is insignificant because saleable minerals (sand, gravel, limestone for aggregate, etc.) are not economic unless very close to market due to haul costs, therefore there is a minimal amount of this activity in inventoried roadless areas.

For leasable energy minerals, the road prohibition would not materially affect road construction and reconstruction providing access to and development within existing lease boundaries, even if those leases are extended beyond their current termination dates. However, the road prohibition would likely prevent expansion of existing mineral lease areas into adjacent inventoried roadless areas. In many cases, such expansion is more economically advantageous to the operator than developing new deposits.

Where reserves are known to occur in inventoried roadless areas, the road prohibition is likely to preclude future development, except in situations where development can occur without road construction. The economic impacts of precluding development of an area depends on a variety of external factors that would lead to development including market prices, transportation, access, plus other factors such as the availability of alternate resources in areas that may be available for leasing (either on other National Forest System lands or on other ownerships). Since mineral deposits tend to be concentrated in some geographic areas, it is likely that the impacts on mining jobs and income would also be concentrated in a few areas. The most immediate economic effects are associated with current proposals to expand existing leases into adjacent inventoried roadless areas for phosphate and coal mining.

Coal

In 1998, over 75 million tons of coal produced from Federal leases on National Forest System land accounted for almost 7 percent of total national production, and about 22 percent of production from Federal leases.

The final roadless rule could affect exploration for or development of known coal reserves on approximately 61,200 acres not currently leased in inventoried roadless areas. These reserves are estimated at between 237 million and 1.3 billion tons of coal near or adjacent to active mines. In addition, there are over 2.5 million acres of inventoried roadless areas with varying levels of potential to contain coal resources suitable for commercial development.

Some of these reserves or resources would likely be developed within the next 5 years if offered for lease. There may also be other coal resources in inventoried roadless areas. However, the extent of the resource is not known and there is no demonstrated industry interest in these.

The mining of coal from inventoried roadless areas is not extensive, but there are active mines on the Grand Mesa, Uncompahgre and Gunnison National Forests (GMUG) in Colorado and the Manti–Lasal National Forests in Utah.

On the GMUG, Arch Coal is interested in expansion into a contiguous inventoried roadless area. Although the mine is an underground operation, expansion may require road access for exploration and development drilling, and construction of ventilation shafts. The mine currently produces about 7 million tons per year. If production cannot be expanded into inventoried roadless areas, the mine could close within two to five years, when current reserves are exhausted. Potential effects from closure of this mine could include the loss of 361 direct jobs and affect 2,119 total jobs.

Two other operating mines adjacent to roadless areas on the GMUG could also be affected. Data was not available on when current reserves may be depleted for these mines, but together the two mines produce about 9 million tons per year and employ 368 people. If future expansion of these operations is precluded by the road

prohibition, and no alternative sources of production are economically attractive, then these mines could be closed after current reserves under lease are mined.

There are also three tracts with known recoverable coal reserves on the Manti–Lasal National Forest that currently are not under lease. Two of the potential tracts have relatively small recoverable reserves, but the third tract has an estimated 135 million tons of recoverable reserves, of which 50 million tons is within inventoried roadless areas. Included in the recoverable reserve estimate are about 22 million tons of recoverable reserves owned by the State of Utah. Access to coal owned by the State of Utah would be guaranteed, as would access to any privately held rights. This tract would require development facilities in an inventoried roadless area, which may preclude development of the rest of the tract once the State's portion of the reserve is extracted.

Oil and Gas

Federal leases are an important source of oil and gas production, but most of the production is from off-shore leases. Production from national forests and grasslands currently accounts for only 0.4 percent of total U.S. oil and gas production. However, interest may increase in response to increasing prices and demands. Although much of the increased development is expected to be off-shore, a number of national forests and grasslands either have current leases, or have applications for permits to explore for natural gas.

Currently over 6 million acres of National Forest System land is under lease for oil and gas. This includes approximately 759,000 acres of inventoried roadless areas considered to have high oil and gas potential under lease. The areas currently under lease will not be materially affected by the roadless rule.

Near the completion of the Roadless Area Conservation FEIS, the Department of Energy (DOE) raised additional concerns about the potential impacts on production of coal, oil, and gas resources if the final roadless rule did not allow road building in support of exploration and development of these leasable minerals. After being informed about these concerns, the Forest Service evaluated the information provided by DOE, in accordance with agency procedures under the National Environmental Policy Act for new information. After careful review of the information provided, the agency concluded that there was no change in the magnitude of the effects as disclosed in the FEIS. The Forest Service included the DOE information in the regulatory impact analysis that accompanied the final rule.

Department of Energy undertook an analysis that focused on the potential impacts to undiscovered oil and gas resources in the two U.S. Geological Survey (USGS)-defined Rocky Mountain regions. Overlaying USGS oil and gas "play" areas on Forest Service maps of IRAs, DOE estimated the acres of IRAs in each of the play areas. (A play is a USGS-designated area with common geologic characteristics that have potential to produce oil or natural gas.) The calculations of oil and gas resources that are estimated to occur beneath inventoried roadless areas are tied to these acreage estimates.

Using information from the Department of Energy, an estimated (mean) 11.3 trillion cubic feet of natural gas and 550 million barrels of oil could potentially underlie inventoried roadless areas. (Estimates range from 3.5 trillion cubic feet to 23.1 trillion cubic feet of natural gas and from 119 million barrels to 1,212 million barrel of oil.) They also estimate that between 63 percent and 78 percent of these potential reserves may be economically recoverable. DOE estimates that historically about one-third of the oil-in-place of known reservoirs is recovered. At the assumed prices ($3–4 per Mcf), the value of the economic activity for these natural gas resources would range from $23 to $34 billion dollars, which would be realized over a number of years.

In addition, on the Los Padres National Forest in California the prohibition of road construction or reconstruction in inventoried roadless areas could affect exploration and possible development of five high potential oil and gas areas and preclude possible future development of up to an estimated 21.4 million barrels of oil.

Based on DOE's figures of total undiscovered resources within the 208 Rocky Mountain play areas examined, estimated resources beneath IRAs account for about 3 percent of undiscovered gas and almost 7 percent of undiscovered oil resources in these play areas. DOE estimates that 2.7 million acres of inventoried roadless acres contain 83 percent (9.3 trillion cubic feet) of the natural gas resource in all inventoried roadless areas. Based on information from the National Petroleum Council this is less than 1 percent of the nation's natural gas resources.

If exploration and development did occur, it would be 5 to 10 years before any production is likely because oil and gas leasing is typically a lengthy process. The value would not be realized in the near future and any production would be spread over multiple years in the future. It is unlikely that exploration in IRAs would be

a high priority because of issues independent of the Roadless Area Conservation Rule, such as access limited by rugged terrain, low probability of occurrence of oil and gas resources, distance to markets, and potential restrictions of other environmental laws.

Transmission lines

There is nothing in the final roadless rule that would prohibit construction of new power lines or oil and gas lines in inventoried roadless areas. However, having to construct these facilities without the use of roads would generally increase the construction and maintenance costs.

Hydropower and Geothermal Energy

The roadless rule FEIS also did not identify any impacts to existing or proposed hydropower or geothermal energy projects.

SUMMARY

While the roadless rule does not impact existing mineral leases and outstanding rights it could impact expansion of existing leases and exploration and development of new mineral leases on National Forest System lands that require road construction or reconstruction in inventoried roadless areas.

Outside of known reserves such as the active coal mines in Colorado, the actual impacts can only be estimated. However, in those identified communities with a history of mining dependence, prevention of existing mining expansion due to the roadless rule could likely have a significant impact.

Predicting the impact on undiscovered resources is difficult since it is unknown how much of these potential reserves are actually underneath inventoried roadless areas or how much of the reserves will be economically recoverable in the future, or what future prices will be.

It is reasonable to assume, under the current demand conditions, that there will be increased interest for development of natural gas resources on Federal lands and elsewhere. However, while it is unlikely that inventoried roadless areas would be a significant contributor at current prices, since exploration in inventoried roadless areas may not be a high priority because of existing rugged terrain and access issues independent of the roadless rule, at higher market prices development of gas resources on Federal lands could increase.

This concludes my statement. I would be happy to answer any questions.

Mrs. CUBIN. Thank you, Mr. Phillips.

The Chair now recognizes Mr. Jeffrey Eppink.

STATEMENT OF JEFFREY EPPINK, VICE PRESIDENT, ADVANCED RESOURCES INTERNATIONAL

Mr. EPPINK. Thank you. Good afternoon, Chairwoman Cubin and members of the Committee. My name is Jeffrey Eppink. I am a Vice President with Advanced Resources, International, an energy consulting firm based in Arlington, Virginia.

At Advanced Resources we have conducted a number of oil and gas resource assessments in recent years. I participated in the National Petroleum Council's 1999 study on natural gas and am currently conducting a major study on the impacts of leasing stipulations which I will elaborate upon later.

Today I would like to present an analysis that we conducted last fall concerning oil and gas resources associated with then-proposed Forest Service inventoried roadless areas. We performed the study for the Department of Energy as a task under a multi-year technical and analytical support contract to the department. We will first present the conclusions from the study, then briefly discuss how the study was conducted and then present specific results.

The analysis shows the following. Nationwide the vast majority of natural gas resources in roadless areas are found in the Rocky Mountain region. Undiscovered natural gas resources in the Rocky

Mountains impacted by the roadless areas amount to 11 Tcf and are mostly contained in the largest nine plays. Less than 5 percent of the roadless areas nationwide contain about 80 percent of the natural gas resources. Implementation of the roadless area rule in the Rocky Mountain region will close to development an additional 9.4 Tcf of natural gas, raising the total estimated by the NPC from 29 to 38 Tcf, a significant 32 percent increase. Economic activity associated with the recovery of natural gas resources associated with roadless areas is estimated to be $23 to 34 billion.

Next I would like to briefly discuss how the study was conducted. The study was comprehensive. In all, we examined 19 Rocky Mountain provinces or basins and 208 plays. The map on the left shows the Rocky Mountain region that was covered by the study. The region contains a vast majority of oil and gas on Federal lands. The red areas on the map depict the so-called inventoried roadless areas, areas which without road access would effectively prohibit oil and gas resource development. Shown on the map in light green are areas of underlying oil and gas resources.

We used resource estimates from several expert groups in the analysis. The vast majority of resource data was taken from the USGS 1995 assessment, which I might add we participated in. For a few selected plays where analysis had been conducted subsequent to the 1995 assessment we supplemented the USGS data with resource estimates conducted by ourselves, the Utah Geologic Survey and the Potential Gas Committee.

The areas of occurrences of resources in the analysis are defined by the intersection of the plays themselves with the roadless areas. Estimates of high, low and mean technically recoverable oil and gas resources were made. The results show that the roadless areas contain from about 3 to 23 Tcf of natural gas with a mean value of about 11 Tcf. The roadless areas also contain from minor amounts to over 1 billion barrels of oil with a mean value of 550 million barrels.

Further in the analysis we examined the issue of access using guidelines established in the NPC study and we determined that implementation of the roadless areas will close to development an additional 9.4 Tcf of gas, a 32 percent increase, and further, that resources subject to access restrictions will increase by 7 Tcf from 137 to 144 Tcf.

To examine the economic impacts for eliminating access to these resources we also provided a cursory examination of the economically recoverable natural gas resources. Based on the mean resource values and prices of $3 and $4 an Mcf, about 68 to 75 percent of the technical natural gas resources could be recovered economically, representing about $23 to 34 billion of economic activity.

We also estimate that the nine largest plays in the study area comprise about 83 percent of the total impacted natural gas resources. We determined that these nine plays represent less than 5 percent of all roadless areas nationwide.

I mentioned earlier that we are conducting on-going resource studies. As follow-up to the NPC study we are currently conducting a major study on the cumulative impacts upon undiscovered natural gas resources of leasing stipulations. We are conducting the study on a detailed township by township basis. The study covers

Southern Wyoming and Northwestern Colorado and preliminary results show that over 60 percent of the natural gas resources are either closed to development or available with restrictions.

We will next be examining oil and gas in the Uinta-Piceance Basin in Utah and Colorado. These studies are being conducted for the Department of Energy and we would be happy to share those results with you when they are available.

I appreciate the opportunity to present our roadless analysis to you and would be glad to answer any questions you might have.

[The prepared statement of Mr. Eppink follows:]

Statement of Jeffrey Eppink, Vice President, Advanced Resources International, Inc.

Good afternoon, Chairwoman Cubin and members of the committee. My name is Jeffrey Eppink. I am a vice president with Advanced Resources International, an energy consulting firm based in Arlington, Virginia.

At Advanced Resources, we have conducted a number of oil and gas resource assessments in recent years. I participated in the National Petroleum Council's 1999 study on natural gas and am currently conducting a major study on the impacts of leasing stipulations upon natural gas resources, which I will elaborate upon later.

Today, I'd like to present an analysis that we conducted last fall concerning oil and gas resources associated with then-proposed Forest Service Inventoried Roadless Areas. We performed the study for the Department of Energy as a task under a multi-year technical and analytical support contract to the Department.

I will present first the conclusion from the study, discuss briefly how the study was conducted, and then present specific results.

The analysis shows the following:

- Nationwide, the vast majority of natural gas resources in Roadless Areas are found in the Rocky Mountain region. Undiscovered natural gas resources in the Rocky Mountains, impacted by the Roadless Areas, amount to 11 Tcf and are mostly contained in the largest nine plays.
- Less than 5% of the Roadless Area nationwide contain about 80% of the natural gas resources under those Forest Service lands.
- Implementation of Roadless Area Rule in the Rocky Mountain region will close to development an additional 9.4 Tcf of natural gas resource, raising the total estimated by the 1999 NPC Study from 29 Tcf to 38 Tcf, a significant 32% increase.
- Economic activity associated with recovery of natural gas resources associated with Roadless Areas is estimated to be $23 to $34 billion.

Next I'd like to briefly discuss how the study was conducted. The study was comprehensive; in all, we examined 19 Rocky Mountain provinces or basins and 208 plays. The map to my left shows the Rocky Mountain region that was covered in the study—New Mexico to Montana plus a portion of North Dakota. This region contains the vast majority of oil and gas on federal lands. The red areas on the map depict the so-called "Inventoried Roadless Areas", areas which, without road access, would effectively prohibit oil and gas resource development. Shown on the map in the light green are areas with underlying oil and gas resources. In dark red within Roadless Areas are areas of high slopes—mountain tops, ridges, etc., which we assumed to be less prospective because they would be locations where it is physically difficult to site a drill rig or because they are could represent difficult geological settings for oil and gas to occur.

We used resource estimates from several expert groups in the analysis. The vast majority of resource data was taken from the USGS 1995 National Assessment. For a few selected plays where analysis had been conducted subsequent to the 1995 Assessment, we supplemented the USGS data with resource estimates conducted by Advanced Resources (for the Department of Energy), the Utah Geological Survey and the Potential Gas Committee (an industry group).

The areas of occurrence of resources in the analysis is defined by the intersection of the plays themselves with the Roadless Areas. Estimates of high, low and mean technically recoverable oil and gas resources were made. High estimates have low probability for occurring; conversely, low estimates have a high probability for occurring. Technically recoverable resources are those that are recoverable using current technology.

The results, presented in the table below, show that the Roadless areas contain from about 3 to 23 Tcf of natural gas, with a mean value of 11 Tcf. The Roadless

Areas also contains from minor amounts to over 1 billion barrels of oil, with a mean value of 550 million barrels of oil.

Technically Recoverable Resources	Natural Gas (Tcf)			Petroleum (MMBO)		
	High	Mean	Low	High	Mean	Low
Inventoried Roadless Areas	23.1	11.3	3.5	1,212	550	69
Rocky Mountain Region	641	323	119	17,574	8,218	1,456

Further in the analysis, we examined the issue of access using guidelines established in the 1999 NPC study (see table below). We determined that, for the Rocky Mountains:

- Implementation of the Roadless Areas will close to development an additional 9.4 Tcf of gas, raising the total to 38 Tcf from the 29 Tcf presented in the NPC Study, a significant 32% increase.
- Resources subject to access restrictions will increase by 7 Tcf (resource formerly under Standard Lease Terms), from 137 to 144 Tcf.

NPC Categorization	Pre-Roadless Areas Resource (Tcf)	Implementation of Roadless Areas Resource (Tcf)
Standard Lease Terms	7.0	-
Available with Restrictions	2.4	-
Closed to Development	1.9	11.3
Total	**11.3**	**11.3**

To examine the economic impacts for eliminating access to these technically recoverable resources, we also provided a cursory examination of economically recoverable natural gas resources. Based on the mean resource values and prices of $3/Mcf and $4/Mcf, about 68 to 75% of the technical natural gas resources could be recoverable economically, representing $23 to $34 billion of economic activity, respectively.

We also estimate that the nine largest plays in the study areas comprise about 83% of the total impacted natural gas resources (please see the map). We determined that these nine plays represent less than 5% of all roadless areas nationwide.

I had mentioned earlier that we are conducting ongoing resource studies. As a follow-up to the 1999 NPC study, we are currently concluding a major study of the cumulative impacts upon undiscovered natural gas resources of leasing stipulations. We are conducting that study on a detailed township-by-township basis. The study we are just now concluding covers Southern Wyoming and northwestern Colorado (the Greater Green River Basin). Preliminary results show that over 60% of the natural gas resources are either closed to development or available with restrictions. We will next be examining the Uinta–Piceance Basin in Utah and Colorado. The studies are being conducted for the Department of Energy and we would be happy to share those results with you when they are available.

I appreciate the opportunity to present our Roadless Areas analysis to you and would be glad to answer any questions you might have.

Mrs. CUBIN. Thank you.

The Chair now recognizes Mr. Moyer.

STATEMENT OF STEVE MOYER, VICE PRESIDENT OF CONSERVATION PROGRAMS, TROUT UNLIMITED

Mr. MOYER. Thank you very much for the opportunity to testify before the Subcommittees today. I am Steve Moyer, Vice President for Conservation for Trout Unlimited.

Trout Unlimited is a nonprofit organization whose mission is to conserve, protect and restore North America's trout and salmon fisheries and their watersheds and we have about 130,000 members spread across the country. The National Wildlife Federation,

the nation's largest wildlife conservation group, endorses the main points of my testimony. The National Wildlife Federation has a deep and abiding interest in the health of the national forests.

Back to Trout Unlimited, our members are thoroughly invested in protecting and restoring trout and salmon habitat in the national forests. Since our inception our members have devoted hundreds of thousands of dollars and thousands of person-hours to on-the-ground restoration work on watersheds in the national forests and we have invested considerable time in the studying and commenting on Forest Service policies and decisions of all types.

We support the roadless policy because of the great fish and wildlife habitats roadless areas contain, because of the substantial adverse impacts that roads have on fish and wildlife habitat, and because of the huge backlog of existing unaddressed forest road maintenance costs. It makes good sense to us to fix the all-too-common existing broken roads in habitat in the national forests before building new roads in the roadless areas and incurring even more costs for which we cannot pay.

As the Subcommittees consider the potential benefits of increased energy production from roadless areas on the national forests, we urge the Subcommittees to fully consider what would likely be the high cost to the Federal treasury, as well as fish and wildlife habitat, if greater energy development were to occur in roadless areas.

Further the Subcommittees should consider the current great needs to restore healthy fish and wildlife habitats that already exist on national forests. And finally, the Subcommittees must consider the huge backlog of road maintenance and reconstruction needs on the existing forest road system and the substantial adverse impacts those poorly maintained roads have on fish and wildlife.

Also I am here today speaking as one of the six trustees of the Theodore Roosevelt Conservation Alliance. The TRCA consists of us, the Izaak Walton League of America, Wildlife Forever, the Mule Deer Foundation, the Rocky Mountain Elk Foundation and the Wildlife Management Institute. The purpose of the alliance is to educate and motivate hunters and anglers to positively influence the future of our National Forest System.

Relevant to today's hearing the TRCA supports the general policy direction contained in one of its square deal initiatives which I mention in my testimony and it was included in a letter to President Bush and to the leaders of this Committee, which I have here with me today and I would like to have included in the record if I could.

Mrs. CUBIN. Without objection.

[The letter follows:]

THEODORE ROOSEVELT CONSERVATION ALLIANCE
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MULE DEER FOUNDATION

ROCKY MOUNTAIN ELK FOUNDATION

TROUT UNLIMITED

WILDLIFE FOREVER

WILDLIFE MANAGEMENT INSTITUTE

The Honorable Barbara Cubin
Chairman
House Resources Subcommittee
Energy and Mineral Resources

The Honorable Ron Kind
Ranking Member
House Resources Subcommittee
Energy and Mineral Resources

Dear Chairman Cubin and Ranking Member Kind,

We the undersigned conservation organizations believe the future of the National Forest System is of great importance to healthy fish and wildlife species, clean water and the opportunity for all Americans to enjoy quality hunting, fishing and outdoor recreation on our public lands.

We support the general forest policy direction contained in "Square Deal Initiative #1" (below) that was carefully drafted by the trustees of the Theodore Roosevelt Conservation Alliance (TRCA).

TRCA's Square Deal Initiative #1
Room to Roam -- Landscape and Access Management

"We urge elected officials and public land managers to scientifically manage all fish and wildlife habitat in the National Forest System, whether roaded or unroaded, as valuable and unique lands that will remain open to hunters, anglers and other public users. Balance accessibility to National Forest lands, with the year round requirements of fish and wildlife (habitat, clean water, food, shelter, open space and disturbance management), while maintaining a functioning forest road system, **including keeping roadless areas roadless** (with science-based exceptions made for forest health, restoration, and other national needs)."

We trust the Congress will keep our views in mind. We also stand ready to assist you in any constructive way. Thank you for considering our views and our offer of support.

TRCA Trustees:

Izaak Walton League of America
Trout Unlimited
Mule Deer Foundation
Wildlife Forever
Rocky Mountain Elk Foundation
Wildlife Management Institute

TRCA Affiliates:

American Crossbow Federation, Ohio
Anaconda Sportsmen's Club, Montana
Arizona BASS Federation, Arizona
Bare Tracks Trophies, LLC, Wyoming
Barrington Rifle Club, New York
Bear Trust International, Montana
Billings Rod & Gun Club, Montana
Black Hills Sportsmen, South Dakota
Bowhunters Wildlife Management Association, New Hampshire
Cambria Bowhunters, Wyoming
Camp Compass, Pennsylvania

Camp Fire Club of America, New York
Center for Wildlife Information, Montana
Central Arizona College Rifle Club, Arizona
Central Coast Chapter of the Mule Deer Federation, California
Comanche Wilderness Outfitters, Colorado
Coonskin Wild Boar Hunting and Fishing Club, New York
Crooked River Ecosystem Education Council, Oregon
Crystal Creek Anglers, Oregon
Deschuttes River Chapter of Trout Unlimited, Oregon
DLM Sporting Goods Company, Colorado
East Yellowstone Chapter of Trout Unlimited, Wyoming
Evansville Sportsmen's Club, Minnesota
Falconer Rod and Gun Club, New York
Fergus Falls Chapter of Minnesota Deer Hunters, Minnesota
Fin, Feather and Fur Conservation Society, New York
Fish and Wildlife Legislative Alliance, Minnesota
Forest Concepts, LLC, Washington
Forester Ranches, South Dakota
Gallatin Valley Chapter of the Mule Deer Foundation, Montana
Game Reserve Association, Ohio
Great Basin Chapter of Trout Unlimited, Nevada
Great Falls Montana Chapter of the Mule Deer Foundation, Montana
Heart Mountain Rod & Gun Club, Wyoming
High Brass, South Dakota
High Desert Forum, Oregon
Hinkley Hill Sportsmen's Club, New York
Hunters Sharing the Harvest, Pennsylvania
Inland Northwest Wildlife Council, Washington
Isanti Chapter of Minnesota Deer Hunters Association, Minnesota
Keystone Conservationist, Pennsylvania
Lake Keuka Chapter of Izaak Walton League of America, New York
Lake Ontario Counties Trout and Salmon Derby, New York
LaSalle Sportsmen's Club, New York
Leatherstocking Club of Oswego, New York
Lee's Ferry Chapter of Trout Unlimited, Arizona
Making Tracks, Wyoming
Merced Chapter of the Mule Deer Foundation, California
Middlesex Conservation Club, New York
Minnesota Deer Hunters Association, Minnesota
Minnesota Trappers Association, Minnesota
Mohave Sportsmen, Arizona
Montana River Action Network, Montana
Montana Wildlife Federation, Montana
Motherlode Chapter of the Mule Deer Foundation, California
Motherlode Gun Club, California
Mount Diablo Chapter of the Mule Deer Foundation, California
Mount Jefferson Rifle, Archery & Pistol Association, Oregon
New Jersey BASS Association, New Jersey
New York State Conservation Council, New York
Niagara County Federation of Conservation Clubs, New York
Niagara River Anglers Association, New York
North American Bear Foundation, Minnesota
North Carolina Wildlife Federation, North Carolina
North Fork Anglers, Wyoming

Northern Arizona Chapter of Safari Club International, Arizona
Ochoco Chapter of Trout Unlimited, Oregon
Ohio Federation of Conservation Clubs, Ohio
Ohio State Coonhunters Association, Ohio
Old Pueblo Chapter of Trout Unlimited, Arizona
Oregon Council of Trout Unlimited, Oregon
Orion – The Hunter's Institute, Montana
Outdoor Buddies, Pennsylvania
Panguitch Anglers, Utah
Pennsylvania Deer Association, Pennsylvania
Pennsylvania Fishing Tackle Manufacturing Co., Pennsylvania
Pennsylvania Sportsmen for the Disabled, Pennsylvania
Pennsylvania Taxidermists Association
Pioneer Conservation Sportsmen, New York
Polvi Hunting Club, Georgia
Pope & Young Club, Minnesota
Public Land Access Association, Montana
Public Lands Foundation, Virginia
Quail Unlimited, South Carolina
Rapidan Chapter of Trout Unlimited, Virginia
Rapids Rod & Gun Club, New York
Red Canyon River Trips, Wyoming
Red Creek Hunting Club, Colorado
Red Lodge Rod & Gun Club, Montana
Riflemen of Wynnes Falls, Virginia
Ripley Rod & Gun Club, New York
Robertson Ammo & Gun Sales, Pennsylvania
Ron Dube's Wilderness Adventures, Wyoming
Safari Outfitters, Inc., Wyoming
Santa Rosa Chapter of the Mule Deer Foundation, California
Schuykill County Chapter of Trout Unlimited, Pennsylvania
Seasoned Ventures, Pennsylvania
Seneca County Federation of Sportsmen's Club's, New York
Skyline Sportsmen's Association, Montana
Sonoma Friends of the NRA, California
South Valley Chapter of the Mule Deer Foundation, California
Sportsmen Conservationists of Texas, Texas
Statewide Sportsmen Inc. of Maryland, Maryland
Stark County Federation of Conservation Clubs, Ohio
The Great Outdoors Conservancy, Florida
Tuolumne County Sportsman Club, California
UAW Local 686 Pistol Club, New York
Utah Wildlife Federation, Utah
Western New York Environmental Federation, New York
White Mountain Chapter of Trout Unlimited, Arizona
Wildeats Enterprises, California
Wine Country Chapter of the Wild Turkey Federation, California
WTR Outfitters, Montana
Wyoming Council of Trout Unlimited, Wyoming
Wyoming Department of Agriculture, Wyoming
Wyoming Wildlife Federation, Wyoming
Yates County Federation of Conservation Clubs, New York
Yosemite Deer Herd Advisory Commission, California
Zane Gray Chapter of Trout Unlimited, Arizona

Mr. MOYER. The letters support keeping roadless areas roadless on the national forests, as well as supporting the scientific management and conservation of all fish and wildlife habitat on the national forests.

Just a few points that I would like to make in addition to what I have said here in my final minutes. Roadless areas are known to include some of the best remaining habitat for fish and wildlife in the nation. Especially in the Western United States, roadless areas are vital for trout and salmon resources and for big game, such as elk and mule deer. These resources sustain hunting and fishing recreation that is extremely valuable to Western communities. According to a study that I have highlighted in my testimony, fishing on the national forests produces about $8.5 billion worth of value to the nation's economy and hunting yields about $6.1 billion. These are very valuable resources that are sustained in part by roadless areas.

A related point, as I have mentioned, is poorly designed and poorly maintained roads are some of the biggest threats to aquatic life and wildlife in our national forests. When you combine this with the backlog that we already have, the Subcommittees really need to ask the question, can we afford to build more roads when we cannot afford to pay for the ones that we already have?

On the energy issue, as you are hearing from this panel, the amounts of energy available may be debatable. What is not, I do not think, is the high cost of developing these resources relative to the cost of developing other energy sources in already roaded areas. And the Subcommittees must look at the cost as well as the benefits of energy production to come from roadless areas.

I just wanted to finish my highlighting the fact that what was already said, 1.5 million people have commented in support of the roadless policy or even making it stronger. And yes, it is true that many of these were post cards or e-mails but still that is a national record in terms of the response to a Federal rule and I think it does show that there is deep support in the American populace for this policy. And I just wanted to highlight the fact that hunters and anglers who are conservationists who use these Federal forest lands are also very much part of the large support for this policy.

Thank you for the opportunity to testify.

[The prepared statement of Mr. Moyer follows:]

Statement of Steve Moyer, Vice President of Conservation Programs, Trout Unlimited

Thank you for the opportunity to testify before the Subcommittees today on behalf of Trout Unlimited ("TU") regarding energy and roadless area conservation on the National Forests. TU is a nonprofit organization whose mission is to conserve, protect, and restore North America's coldwater fisheries and their watersheds. TU has more than 130,000 members in the United States.

TU and our members are deeply invested in protecting and restoring trout and salmon habitat on the National Forests. Since our inception in 1959, our members have devoted hundreds of thousands of dollars and thousands of man-hours to on the ground restoration work on watersheds on the National Forests. They have invested considerable time into studying and commenting on Forest Service policies of all kinds, from national policies such as the roadless conservation policy, to revisions of national forest management plans, to individual road reconstruction and grazing allotment decisions.

Summary of TU's Position on the Forest Service's Roadless Policy

TU supports the roadless policy because of the great fish and wildlife habitats roadless areas contain, because of the substantial adverse impacts that roads have on fish and wildlife habitat, and because of the huge backlog of existing, unaddressed forest road maintenance costs. It make good sense to us to fix the all too common existing broken roads and habitat in the National Forests before building new roads into roadless areas and incurring even more costs for which we cannot pay.

As the Subcommittees consider the potential benefits of increased energy production from roadless areas on the National Forests, we urge the Subcommittees to fully consider what would likely be high costs to the federal fisc as well as fish and wildlife habitat if greater energy development were to occur in roadless areas. Further, the Subcommittees should consider the current, great needs to restore healthy fish and wildlife habitats on the National Forests. Finally, the Subcommittees must consider the huge backlog of road maintenance and reconstruction needs on the existing forest road system and the substantial adverse affects those poorly maintained roads have on fish and wildlife. I assure you that TU stands ready to assist the Subcommittees as they consider these important aspects of forest road policy, and fish and wildlife habitat, in addition to the ramifications of the roadless area policy itself.

Summary of the Theodore Roosevelt Conservation Alliance (TRCA) Position on Managing the National Forests and Roadless Areas

I am also here today speaking as one of the six trustees of the Theodore Roosevelt Conservation Alliance (TRCA). The TRCA consists of TU, the Izaak Walton League of America, Wildlife Forever, the Mule Deer Foundation, the Rocky Mountain Elk Foundation, and the Wildlife Management Institute. Our organizations believe the future of the National Forest System is of great importance to healthy fish and wildlife species, clean water and the opportunity for all Americans to enjoy quality hunting, fishing and outdoor recreation on our public lands. The purpose of our Alliance is to educate and motivate hunters and anglers to positively influence the future of our 192 million-acre National Forest system.

Relevant to today's hearing, TRCA supports the general forest policy direction contained in "Square Deal Initiative 1" (below) that was carefully drafted by the TRCA trustees, and was included in the a letter to President Bush, which was signed by over 100 sportmen's conservation clubs across the nation. I have brought copies of the letter for the Subcommittees, and I ask that it be included in the hearing record.

TRCA's Square Deal Initiative 1: Room to Roam—Landscape and Access Management

> "We urge elected officials and public land managers to scientifically manage all fish and wildlife habitat in the National Forest System, whether roaded or unroaded, as valuable and unique lands that will remain open to hunters, anglers and other public users. Balance accessibility to National Forest lands, with the year round requirements of fish and wildlife (habitat, clean water, food, shelter, open space and disturbance management), while maintaining a functioning forest road system, including keeping roadless areas roadless (with science-based exceptions made for forest health, restoration, and other national needs)."

National Forest Roadless Areas Contain Valuable Fish and Wildlife Habitat, Which Sustains Valuable Hunting and Fishing Recreation.

The roadless policy would ban new road construction in 58 million acres of inventoried roadless areas in the National Forests, while maintaining access for anglers, hunters and other public users. Roadless areas are known to include some of the best remaining habitat for fish and wildlife in the nation. Especially in the western U.S., roadless areas are vital for trout and salmon resources, and for big game, such as elk and mule deer. National Forests support 80% of the elk, mountain goat, and bighorn sheep habitat in the lower 48 states.

The following are a few examples from Montana National Forests:

- The South Fork of the Flathead has perhaps the state's strongest populations of bull trout and westslope cutthroat trout. Most of the watershed is roadless (mainly in the Bob Marshall wilderness).
- The Blackfoot drainage has some of the healthiest populations of migratory bull and cutthroat trout in Montana. The three most important spawning tributaries for bull trout are Monture Creek, the North Fork and the Landers Fork. Large

portions of these watersheds are roadless. Bull trout are uncommon in heavily roaded drainages of the Blackfoot drainage.

- Rock Creek is one of the most popular wild trout fisheries in the state. Approximately half of the watershed is roadless. Biologists have found that most of the important spawning and rearing areas for bull trout are in waters flowing through roadless areas such as the Quigg Peak and Stony Mountain areas.
- The majority of the remaining pure-strain native westslope cutthroats in the upper Missouri drainage, where these fish hang on by a thread, are in roadless areas found along the Rocky Mountain Front, in the Elkhorns, in the upper Big Hole watershed and in the roadless fragments found near the Continental Divide.

Fish and wildlife resources found on National Forests, such as those highlighted above, sustain hunting and fishing recreation that is extremely valuable to local economies. According to a 1999 report from the American Sportfishing Association, in 1996 fishing on the National Forests produced $8.5 billion to the nation's economy. Hunting yielded $6.1 billion. Much of this value comes from trout and salmon fishing, and big game hunting. Roadless area protection is tied to the long-term sustainablity of these huge benefits.

Simply put, world class hunting and fishing are still available to the public in the remote areas of our National Forests and use trends show hunting and angling rising at five percent per year nationwide. In some areas like California, hunting use of National Forests is doubling in eight years, while fishing use of Alaska's Tongass National Forest doubled in the last seven years. Further, if America's 50 million hunters and anglers grow in proportion to the population of the U.S. during this century, wild space open to the public will be at an absolute premium.

Roads Often Damage Fish and Wildlife Habitats

Existing poorly designed and maintained roads are some of the biggest environmental threats to aquatic life and wildlife in our National Forests, promoting soil erosion in fish spawning and rearing areas and destroying the water quality of streams.

Studies from the Forest Service's Interior Columbia River Basin plan, for example, conclude that:

- Increasing road density and management intensity is correlated with declining pool frequency and increased fine sediments in streams. Pools are important winter and foraging habitat. Sediment from roads fills pools and smothers spawning gravels. Thus, roads are harming critical elements of aquatic habitat.

A Huge and Pressing Backlog of Forest Road Maintenance Needs Already Exists.

The Subcommittees should bear in mind that the forest roads debate should start by recognizing that the Forest Service has an $8.4 billion backlog on maintenance and reconstruction of its existing 386,000 miles of road. As we consider the prospect of building new roads to access hard to reach, potential, energy or timber sources, we need to address the question, "Why build more when we can't care for what we have?"

The Tongass road situation is but one bad example. The Forest Service in cooperation with the State of Alaska, recently completed the Tongass Road Condition Survey, which determined that 53 percent of culverts (164 of 301 culverts) in Class I streams are impeding passage of juvenile salmon under certain conditions, while another 29 percent (80 of 301 culverts) in Class I streams may be impeding passage. The estimate for repairing the culverts in the Tongass National Forest is at least $20 million.

There is a clear need for the Resources Committee to request, and for Congress to appropriate, the funds that the Forest Service needs to improve road maintenance and reconstruction, as well as funds needed to eliminate unfixable roads, which are damaging fish and wildlife habitat.

The Amount of Available Energy from Roadless Areas is Debatable. The High Cost of Developing Those Resources, Relative to the Costs of Developing Other Energy Sources in Roaded Areas, Is Not.

According to the Forest Service, the roadless policy could have some impact on leasable minerals, such as oil and gas, because the policy would prohibit road construction associated with future mineral leasing. Yet, the Forest Service's roadless documents say that there appears to be relatively small amount of oil, gas and coal in roadless areas. In context, total oil and gas production from all National Forest lands is about 0.4 percent of the nation's supply, and since the roadless areas have been available to oil and gas leasing for many years and have remained undeveloped, it is difficult to see where the supplies really are.

A study done recently for the Energy Department held a different view. The study found that roadless areas "contain moderate to significant amounts of natural gas and oil.—

TU is not an energy expert and thus we are unable to shed much light on the debate surrounding availability of energy sources on roadless areas. What we do know is this: roadless areas have remained such for a reason—most are difficult to access. Building roads to access energy in the roadless areas would likely be costly ventures. Add in the fish and wildlife habitat harm produced by these roads, and the result of any contemplated energy development in roadless areas is likely to be an expensive proposition. The Subcommittees must carefully look at the costs, as well as the benefits, of energy production from roadless areas.

Millions of Americans, Including Hunters and Anglers, Support Keeping Roadless Areas Roadless.

Finally, the Subcommittees should keep in mind that 1.6 million Americans commented in favor of the roadless policy being as protective, or more so, than it is right now. This is the largest outpouring of public support for any federal rulemaking in history.

Similarly, a survey of American hunters and anglers commissioned by the TRCA last year found a very strong response from sportsmen and women in support of keeping roadless areas roadless: 83% of respondents favored such a proposition. In short, support for roadless area protection runs deep, and it includes sportsmen and women.

In sum, TU supports the roadless policy because of the high habitat and recreational values that they sustain, and because the substantial damage roads incur on fish and wildlife habitat. We also support the best science-based management of those areas, as well as all of our National Forests. We urge the Subcommittees to fully consider what would likely be high costs to the federal fisc as well as fish and wildlife habitat if energy development were to occur in roadless areas.

We look forward to having a more detailed dialogue with the Subcommittees on these issues. Also, we urge the Subcommittees to work with us on fixing the long-standing problems associated with lack of funding for roads maintenance and reconstruction and fish and wildlife habitat restoration.

Thank you for the opportunity to testify at the hearing.

Summary of TU's Position on the Forest Service's Roadless Policy

TU supports the roadless policy because of the great fish and wildlife habitats roadless areas contain, because of the substantial adverse impacts that roads have on fish and wildlife habitat, and because of the huge backlog of existing, unaddressed forest road maintenance costs. It make good sense to us to fix the all too common existing broken roads and habitat in the National Forests before building new roads into roadless areas and incurring even more costs for which we cannot pay.

As the Subcommittees consider the potential benefits of increased energy production from roadless areas on the National Forests, we urge the Subcommittees to fully consider what would likely be high costs to the federal fisc as well as fish and wildlife habitat if greater energy development were to occur in roadless areas. Further, the Subcommittees should consider the current, great needs to restore healthy fish and wildlife habitats on the National Forests. Finally, the Subcommittees must consider the huge backlog of road maintenance and reconstruction needs on the existing forest road system and the substantial adverse affects those poorly maintained roads have on fish and wildlife. I assure you that TU stands ready to assist the Subcommittees as they consider these important aspects of forest road policy, and fish and wildlife habitat, in addition to the ramifications of the roadless area policy itself.

Mrs. CUBIN. Thank you, Mr. Moyer. I am one of those hunters and fishermen that oppose the policy.

We have a series of votes so we will not be able to take the testimony of the other two witnesses until about 3:30 when we should be able to be back. Thank you very much and thank you for your patience.

[Recess.]

Mr. PETERSON. I welcome you back to the hearing. I am Congressman Peterson, Fifth District, Pennsylvania. I am the substitute for the substitute for the substitute.

We are going to call now on Mr. Greg Schaefer, Director, External Affairs, Western Region, Arch Coal Company.

STATEMENT OF GREG SCHAEFER, DIRECTOR, EXTERNAL AFFAIRS, WESTERN REGION, ARCH COAL COMPANY

Mr. SCHAEFER. Thank you, Mr. Chairman. And for the record a special hello to Congresswoman Barbara Cubin, who is my representative in Wyoming.

The Forest Service has a mineral policy which states that "the national forests and grasslands have an essential role in contributing to an adequate and stable supply of mineral and energy resources." This policy is as important today as it was the day it was written. The mineral policy further states that the Forest Service requires "reclamation plans for all proposed surface-disturbing activities to return the land to productive uses, in accordance with land management goals."

As you listen about the backlog of maintenance on roads on Forest Service lands, keep clearly in mind that any road that we construct or reconstruct must be reclaimed at our own sole expense to a condition at least as good as it was premining.

The final rule stated that the action was not designed to prohibit mining but only prohibits road construction and reconstruction. Roads are needed, however, even with underground mining operations for such activities as exploration drilling, construction and maintenance of mine ventilation and for emergency situations.

Relative to energy, California has drawn a great deal of attention over the past year. Currently the State of California is importing 25 percent of their electric needs from other Western states. There are no major coal-fired power plants in the State of California but coal-fired generated electricity still accounts for 20 percent of their total electric consumption. Some of these sources include the Intermountain Power Project in Utah, which is owned by the City of Los Angeles and burns Utah Coal; the Reid-Gardner Unit Number 4 in Nevada, which burns Utah and Colorado coals; the Deseret G&T plant in Utah, which burns Utah coal; the Boardman plant in Oregon, which burns Utah, Colorado and Wyoming coals; and various other sources, including PacifiCorp in Utah, which is supplied by Utah coal. Each of these power plants obtains coal from mines that are either on or immediately adjacent to the new roadless areas.

The North Fork Valley of Colorado produces between 50 and 60 percent of the total volume of coal in Colorado and is the fastest coal-producing region in Colorado. These underground mines employ about 700 people in rural Colorado with an annual payroll of about $50 million. Forty percent of the coal mined in Colorado stays in Colorado to be used to generate electricity; the rest of the coal is shipped to other states, such as Kentucky, Illinois, Wisconsin, Michigan, Oregon, Minnesota, Texas, Iowa, and Utah.

The Department of Energy reported that "the West Elk Mine will require access in the next one to 5 years of high-quality coal resources that lie partially or entirely under roadless areas. Approximately 200 million tons of high-quality coal would be put off-limits

[which is roughly a 35-to 40-year supply for that mine] and the mine would be forced to close prematurely. As a result, the $100 million worth of infrastructure already invested in this mine would be abandoned. The Bowie Mine in Colorado is hemmed in on the north and west by roadless areas. These are the logical directions for expansion of this mine. This mining company estimates that the roadless rule would put 50 million tons of high-quality coal off-limits."

In Utah the map of Utah shows that the significant portion of Utah's coal production, almost 70 percent, is located on the Manti-LaSal National Forest and is either overlain or adjacent to the roadless area boundary. Over half of Utah's coal production is also used in generating plants within the State of Utah. Utah coal is also exported to Nevada, Missouri, Oregon, Illinois, Kentucky, Nebraska and to the Pacific Rim.

The State of Utah is unique among coal-producing states in that it does not have an extensively developed rail system for many of the mining operations and coal-fired power plants. That means in most instances the Utah power plants are reliant on local sources of coal. For example, the Hunter Power Plant, which has no rail service, is planning on a significant expansion to meet energy demands in Utah and other Western states, such as California. As mentioned, the City of Los Angeles owns the Intermountain Power Project in Utah and is also planning a significant expansion.

The proposed power plant expansions in Utah could add as much as a 40 percent increase in in-state demand for Utah coal used for electric generation. As a result of this rule, the coal industry is facing a long-term impact to the coal supplies in Colorado and Utah. I hope that Congress carefully looks at this impact to energy production in the West and corrects the mistakes that have been made due to a lack of sufficient information.

Again thank you for the opportunity to speak today.

[The prepared statement of Mr. Schaefer follows:]

Statement of Greg Schaefer, Director, External Affairs, Arch Coal Company, on Behalf of the National Mining Association and the Colorado, Utah and Wyoming Mining Associations

Good afternoon and thank you for the opportunity to speak to you today regarding the Roadless Area Final Rule. My name is Greg Schaefer and I am Director External Affairs Western Operations for Arch Coal, Inc. I am also here on behalf of the National Mining Association (NMA) as well as the Colorado, Utah and Wyoming Mining Associations. As background, Arch Coal is the second largest coal producer in the nation, producing about 112 million tons of high quality coal annually. We serve 149 power plants in 30 states. We currently have six operating coal mines in the western United States, four of which operate at least partially on National Forest Service lands.

At the outset let me say that the Forest Service, throughout the rulemaking process, stated the rule was not designed to prohibit mining, it would only prohibit the construction and reconstruction of roads. In fact the preamble to the rule states that "[m]ineral leasing activities not dependent on road construction such as "underground development, would not be affected by the prohibition." This proposition was refuted in the record by a Department of Energy report ("Impact of the Roadless Initiative on Coal Resources" Bill Hochheiser, November 30, 2000) which provided, "[w]hile these resources are recovered using underground mines, roads are needed to build ventilation shafts and for safety." Simply put, one must have roads for mineral exploration and development. This point was clearly made in the rulemaking record and obviously ignored by the rule's authors.

Impacts on Energy Resources

The Forest Service has a stated policy regarding minerals on Forest Service Lands which states:

> "The Federal Government's policy for minerals resource management is expressed in the Mining and Minerals Policy Act of 1970— '...foster and encourage private enterprise in the development of economically sound and stable industries, and in the orderly and economic development of domestic resources to help assure satisfaction of industrial, security, and environmental needs.' Within this context, the national forests and grasslands have an essential role in contributing to an adequate and stable supply of mineral and energy resources while continuing to sustain the land's productivity for other uses and its capability to support biodiversity goals."

This policy is as important today as it was on the day it was written. Coal and mineral resources from Forest Service lands are vital to supplying electricity at a reasonable price and in an environmentally sound manner. The mineral policy also states that the Forest Service "require reclamation plans for all surface-disturbing activities to return the land to productive uses consistent with the ecological capability of the area and in accordance with land management goals." This policy is consistent with state and federal laws and regulations governing coal mining activities.

As I will describe in more depth later in this testimony, the Forest Service proposed and promulgated the Roadless Area Conservation Rule without sufficient information to perform an adequate analysis of the rule's impact on coal production from Forest Service lands. Only after the abbreviated 60-comment period closed did it become clear what areas would be affected and to what degree. When this information became available to the Forest Service, it was glossed over or completely ignored in the Final Environmental Impact Statement (FEIS), the final rule and its preamble.

Due to the lack of detailed information, the Forest Service significantly underestimated the rule's impact on energy supplies in the western United States. The preamble to the final rule shows the effort to which the Department has gone to try and minimize the impact of the rule. Faced with the additional information that we provided, the Forest Service concluded:

> "Moreover, it seems likely that even if resources do underlie inventoried roadless areas, they would be among the last areas entered for exploration and development...the agency has determined that the information does not materially alter the environmental analysis disclosed in the FEIS and does not constitute significant new circumstances or information relevant to environmental concerns bearing on the rulemaking effort."

The fallacy of this statement can be seen on the attached maps. The additional coal resources needed to keep the West Elk Mine alive would be among the first areas entered for exploration and development—not among the last.

The Department also downplayed the significance of National Forest Service lands as a source of high quality, low sulfur coal. In the preamble to the final rule they stated:

> "The FEIS described the coal production from NFS lands as accounting for about 7% of national production in 1999."

This statement implies that tightening up access simply will not have much impact on energy production from National Forest Service lands. However, last year our Black Thunder Mine in Wyoming alone produced over 60 million tons of coal, which represents over 5% of national production by itself. The Black Thunder Mine is located in the Powder River Basin of Wyoming and is located on the Thunder Basin National Grasslands which is managed by the National Forest Service. In speaking with Forest Service personnel, it was learned that they do not have a good method of estimating coal production from National Forest Service lands. A quick survey of some of producers on the Thunder Basin National Grasslands revealed that these few mines in Wyoming accounted for 8–10% of national coal production. This completely ignores coal production from National Forest Service lands in Colorado and Utah. If accurate data were used, the percentage of national coal production from National Forest Service Lands could very likely be 15–20%, which is a very significant percentage.

In the justification for limiting access to high quality coal reserves on National Forest Service lands, which ultimately leads to phasing out the existing mining operations, the Department concluded:

> "Overall, the U.S. has abundant coal reserves. Also, alternative sources of low-sulfur coal do exist, concentrated in the western U.S., mostly in Colorado, Montana and Wyoming. Additionally, the abundant sources of low

cost-coal and available technology, such as scrubbers, will enable electric utilities to meet their Clean Air Act compliance goals."

This statement writes off significant sources of high quality compliance coal in Utah and parts of Colorado and creates major problems for the generators of electricity in Utah. The premise for this statement is simply incorrect, and will be discussed below.

Colorado Impacts

The State of Colorado produces close to 30 million tons of high quality bituminous coal annually. Roughly 45% of this coal is used within the state and the remainder is exported to other states. The North Fork Valley near Paonia, Colorado (roughly 90 miles east of Grand Junction, Colorado) produces approximately 60% of the total volume of Colorado coal, and is the fastest growing coal-producing region in Colorado. This area consists of three underground coal mines: Arch's West Elk Mine, the Oxbow Mine and Bowie Resources. It is anticipated that these three mines will produce up to16 million tons of coal in 2001 with about 700 employees and an annual payroll of $50 million.

In 1999, coal from these three mines was shipped to power plants in Colorado, Kentucky, Illinois, Wisconsin, Michigan, Oregon, Minnesota, Missouri, Texas, Iowa, and Utah. The Utah power plant supplied by this coal was the Intermountain Power Project (IPP) which is owned by the City of Los Angeles and provides low cost reliable power to California.

The Department of Energy report referenced above highlights some of the energy impacts created by the roadless rule:

> "This coal is highly valued by these utilities because of its low sulfur content (0.5%) and high Btu value. Utilities such as Tennessee Valley Authority rely on this coal as their Clean Air Act compliance strategy. The utilities blend this coal with other, higher sulfur, lower Btu coal to achieve compliance, and burn the Colorado coal exclusively during time of high demand in order to avoid derating of their plants while staying under air emissions limits."

The Department of Energy report also describes specific energy impacts in the North Fork Valley:

> "The West Elk Mine requires access in the next one to five years to three areas of high quality coal resources that lie partially or entirely under roadless areas. Approximately 200 million tons of high quality coal would be put off limits and the mine would be forced to close prematurely. In addition, as much as 50 million tons of coal on the existing lease would likely not be mined because planned longwall panels that would extend into unleased federal coal would not proceed. As a result, the $100 million of infrastructure already invested in this mine would be abandoned."

The West Elk Mine produces seven million tons of coal per year, providing $26 million dollars per year of direct labor income and almost $90 million of direct plus indirect income. The potentially unminable 200 million tons of coal have a value of $3 billion. Using the multiplier of 3.5, as used in the FEIS (p.3–316, table 3–68), this represents a total of over $10 billion in foregone economic activity.

The Bowie mine, northwest of the West Elk mine, is hemmed in on the north and west by roadless areas. These are the logical directions of expansion for this mine. This mine produces five million tons of high Btu/low sulfur coal and employs 178 people at the mine, with an annual payroll of $9 million per year. This translates to more than $30 million per year of direct plus indirect economic impact.

The mining company estimates that the roadless rule would put 50 million tons of high quality coal off limits to the Bowie mine, coal with a value of $750 million. Using the multiplier from the previous bullet, this translates to over $2.5 billion of economic activity."

Utah Impacts

In Uinta coal region of Utah, the Forest Service concentrated on only three tracts: the Muddy, Ferron, and North Horn tracts. These tracts are either next to an existing mine or contain sufficient high quality reserves to support a new mine. The FEIS that preceded the final roadless rule estimates these three tracts contain 185 million tons of high–Btu coal. This coal would have a value of over $2.8 billion to $3.7 billion if mined.

While these three tracts represent a sizable amount of coal, they also represent only the tip of the iceberg as shown on the attached map of the Uinta region. The roadless areas block mine development and expansion across the entire western boundary of the region. None of this information regarding resource information out-

side of the three tracts was considered by the rule writers nor the authors of the FEIS.

The primary impact of the roadless area rule in Utah will be on the Manti–LaSal National Forest. The map shows that a significant portion of Utah's coal industry is located in the Manti–LaSal National Forest and is either overlain or adjacent to the roadless area boundary. The State of Utah annually produces roughly 25 to 27 million tons of high quality, low sulfur coal, half of which is used in the State of Utah. Just under 50% of the coal is exported to states such as Nevada, California, Oregon, Illinois, Missouri, Kentucky, Idaho, Colorado, Washington, Wyoming and Tennessee for electric generation (about 26%) and other industrial/commercial/residential uses (%16). Depending on the exchange rate and the demand for steam and metallurgical coal about 10% of Utah coal is exported to Pacific Rim countries through the Los Angeles Export Terminal.

The existing coal mines that are overlain by or adjacent to the Roadless Areas are the SUFCO, Deer Creek, Trail Mountain, Crandell and Star Point mines. In 1999 these mines represented almost 70% of the coal production in the State of Utah.

The State of Utah is unique among coal producing states in that it does not have an extensively developed rail system for many of the mining operations and coal-fired power plants. This means that in many instances the Utah power plants are much more reliant on local sources of coal than counterparts in other states. For example, the Huntington Power Plant has no rail service and must rely on local mines to supply coal by truck. This plant is planning a significant expansion to meet energy demand needs for the State of Utah, as well as for export to other western states (e.g., California).

The City of Los Angeles owns the Intermountain Power Project (IPP), with the power generated by this plant being exported to California. As a part of the current energy crisis in California, the IPP plant is also considering a significant expansion. The vast majority of the coal used at this plant is from the State of Utah.

The potential power plant expansions in Utah could add as much as a 40% increase in in-state demand for Utah coal. This is at a time when the number of coal mines in Utah have been decreasing and significant uncertainty has been added due to the roadless rule. A complicating factor in the State of Utah is the settlement agreement between the state and the federal government over the lost coal resources as a result of the designation of the Grand Staircase Escalante National Monument. In this settlement agreement, the federal government transferred temporary ownership of some coal reserves to the State of Utah (SITLA). The final rule states that these tracts have valid existing rights and can be mined. However, after the tracts, a certain amount of coal has been produced from these tracts, they revert back to the federal government. Furthermore, some of these tracts will need adjacent coal in order to justify the capital needed to build a mine. Where that adjacent federal coal is encumbered by the roadless area prohibitions, the likelihood of one investing capital in these mines is diminished.

California

This section briefly discusses the role of coal in the State of California. This State was chosen since it is currently in the middle of a critical energy crisis and has generated a great deal of attention. Currently, the State of California is meeting 75% of its electric needs by in-state generation and is importing the remaining 25% from other western states. There are no major coal-fired power plants in the State of California, but coal-fired-generated electricity still accounts for 20% of their total energy mix [1]. Some of these sources include the Intermountain Power Project in Utah (Utah coal); Reid–Gardner Unit 4 in Nevada (Utah and Colorado coals); Deseret G&T in Utah (Utah and Colorado coals); Boardman Plant in Oregon (Utah, Colorado and Wyoming coals). Each of these sources receives a portion of its coal from mines underlying areas affected by the roadless rule. The State of Califonia also has various "northwest contracts" from various sources including Pacificorp in Utah, which is supplied by Utah coal and similarly affected by the rule. As can be seen, the Utah and Colorado coal industries are an integral and critical part of not only the Utah and Colorado electric supply but also the State of California as well.

Summary

The Nation must use our vast domestic resources to meet the growing energy requirements that an expanding economy requires. Many of these resources, including coal, are found on lands administered by the Forest Service and on other public

[1] Source: 1999 Net System Power Calculation, Electricity Analysis Office, California Energy Commission , April 2000

lands. Demand for coal for affordable, reliable electricity is expected to increase by over 25% during the next 20 years. Nearly 90% of this additional coal production will come from public lands in the West; much from Forest Service administered lands impacted by this rule. If this affordable coal is not available, high costs for alternative fuels will mean higher electricity costs and lower electricity reliability. Also, the coal industry will continue to be required to reclaim any surface disturbance to at least as good a condition as the premining landscape.

The Roadless Area Initiative Process.

I have been involved in the Roadless Area proceedings since President Clinton announced the initiative on October 13, 1999. I attended several public scoping meetings, including one in Grand Junction, Colorado in December, 1999 and subsequently requested an extension of time of the scoping period. In our letter, dated December 17, 1999, requesting an extension of time we made several requests that have never been adequately addressed in this process

> "It is difficult, if not impossible, to provide knowledgeable comments on the proposal when the Forest Service has not provided the public with sufficient detail. For example, the Forest Service has not provided maps with any level of detail to be able to develop questions or comments relative to our operations. Just prior to writing this letter, I went to the Forest Service website dedicated to the Roadless Area initiative and it still states that the maps are 'Under Development'. In Colorado, a public hearing was held in Grand Junction, Colorado. Once again, the Forest Service provided maps, but in this case they were 'conceptual', and lacked any meaningful detail. We have asked for detailed maps, that included coordinates, townships, ranges, and sections, but have been unable to acquire the requested information. Local Forest Service personnel have tried to help, but they have warned us that even when the maps are available, they may not be accurate? At a minimum, the Forest Service should provide the following so that meaningful comment can be submitted:
>
> > Detailed maps showing the location of the proposed roadless areas, with coordinates, sections, townships and ranges. Identify the coal reserves that are located within the proposed roadless areas, as well as quantify the coal quality of those reserves. Identify the location of existing mining operations that could access these reserves, and provide an analysis of the socio-economic consequences of the inability to obtain additional reserves. If there are no nearby mining operations, assess the impact on the loss of those coal reserves from the reserve pool."

The Forest Service never addressed this request. Subsequently, maps were posted on the website after the close of the public comment period, but the scale and lack of legal description made them virtually useless for assessing local impacts, but did give us a sense that we should look very closely at our Colorado operation in particular. The same information was requested by the NMA though a Freedom of Information Act (FOIA) request during the comment period for the proposed rule. After the close of the comment period, NMA was told in a formal response from the Forest Service that, in short, the maps and the relationship between roadless areas and mineral reserves were available on the Forest Service web site. Anyone who saw the information on the Forest Service web site knows this statement is just plain wrong.

Fearing that we would not have any data in which to assess the boundary of the Roadless Area relative to our West Elk Mine in Colorado, we set out on a mission to try and develop our own map(s). Working with a local Forest Service employee we dug up the RARE II boundary that was proposed in 1979 and plotted that information on our mine plan map. It was found that the boundary passed right over the top of the West Elk Mine and contained nearly all future reserves accessible by this underground mine. As it turned out, the 1979 RARE II boundaries were used in setting the boundaries of the Roadless Area without any further review of any changes over the 20-year period. Of particular interest is that this boundary encompasses lands that contain a significant number of existing roads.

Once this map was developed, we met with the Regional Forester's Office in Denver, Colorado in early February 2000. Their response was that they were pleased to have a map with this level of details, as they had not been provided with any detailed information from the Washington, D.C. Office of the Forest Service. The Regional Office acknowledged the problem and asked what relief we were seeking. Our response was that since the West Elk Mine was on the margin (edge) of the proposed Roadless Area that we would like the boundary slightly modified in order to provide a future for the West Elk Mine. The reply was that there was not an opportunity to move the boundaries as that decision had already been made.

Even though the public comment period had closed, we provided the map that we had developed to the national Forest Service Team working on the Roadless Area Environmental Impact Statement. One member of the team reiterated that there was no opportunity to move the boundary as that decision had already been made. Our question was how could that be if the Draft Environmental Impact Statement was only now being prepared?

All of our efforts during this period were reflected in one small paragraph of the DEIS, which stated:

> "[The prohibition of road construction] could increase exploration and development costs for leaseable minerals so that deposits in inventoried roadless areas may be less economically feasible for development. For example, one Colorado coal company has submitted information showing that the opportunity to access coal resources adjacent to their existing leases would be severely limited by a prohibition on road construction."

Leadership in the Forest Service either did not have adequate information or chose to ignore it. The problem remained that there was a lack of detailed map information. Arch Coal commissioned a consultant to develop the location of existing, and in some instances prospective coal leases, on the Grand Mesa, Uncompaghre and Gunnison (GMUG) National Forest in Colorado. Significant resources were put into developing this map, but the most difficult aspect was obtaining the legal descriptions of the proposed roadless areas.

During the development of these maps, we continued to meet with the minerals branch of the Forest Service, the Department of Energy, Office of Management and Budget, Council on Environmental Quality, among others. A scheduled meeting with Forest Service Chief Mike Dombeck was "delegated" as the Director and other senior members of the Forest Service canceled the meeting to lower level staff at the last moment.

During one meeting with the Department of Energy we were shown a Roadless Area delineation map supplied to them by the Forest Service that showed several areas of significant impact to the coal industry on the Manti–LaSal National Forest in Utah. This information was stunning for two reasons: first, the Forest Service had never made this information public; and second, our company had been told several times by local forest service officials that there was no impact to our underground coal mining operations in Utah. Unfortunately, we took that declaration at face value.

Upon the revelation that the issue extended beyond our Colorado operations, we also commissioned the consultant to perform the same mapping exercise for the Manti–LaSal National Forest in Utah. The Colorado and Utah maps were finally completed right about the time the Final Environmental Impact Statement was issued, and are attached and incorporated in this testimony. Although the final rule can be published as soon as 30 days following publication of the FEIS, the message these maps conveyed manifested a significant impact the Forest Service failed to project and the message was conveyed to the Department of Energy, the Office of Management and Budget, the Council on Environmental Quality and the Forest Service.

Notwithstanding this compelling information, the preamble to the final rule states:

> "The Department has decided not to adopt the exception for future discretionary mineral leasing because of the potentially significant environmental impact that road construction could cause to inventoried roadless areas."

This is clearly an excuse and not a valid reason. State and federal mining regulations require that all surface disturbances associated with the mining operation must be reclaimed to a condition at least as good as the pre-mining condition. This means that any roads developed in conjunction with the mine, including exploration, development or operation must be reclaimed. Further, state and federal mining regulations require that the quality of surface and ground water must be protected.

In a further effort to convince the public that these lands need to be off-limits for future mineral development the preamble states that if road construction and reconstruction were allowed for future energy and mineral leasing, an additional 59 miles of road over a five-year period would be built in roadless areas (including oil, gas and non-fuel minerals). The preamble further states that at this rate, 10 million acres would be affected, which is interesting considering that the Department only identified 8 million acres that have the potential for oil and natural gas (of which 2.5 million acres have potential for coal and coal bed methane). Again, the Forest Service has conveniently ignored the fact that roads developed in conjunction with mining must be fully reclaimed to a condition at least as good as the pre-mining condition.

Protections for Roadless Values Already Exist

The Forest Service chose to accept these severe proscriptions for roadless areas even though roads associated with coal mines are temporary and the Surface Mining Control and Reclamation Act (SMCRA) mandates that these roaded areas be reclaimed to a condition as good or better than they were before mining. Furthermore, surface coal mines cannot be permitted at all on Forest Service lands unless the Secretary of Interior "finds that there are no significant recreational, timber, economic or other values which may be incompatible with surface mining operations..." (Section 522(e)2)) In other words, the values the rule is intended to safeguard have already been considered and protected by an existing statute.

During the rulemaking process, the Forest Service also ignored the fact that the SMCRA provides the exclusive statutory scheme for designating areas unsuitable for coal mining. The first question the authors of this rule should have asked was whether the agency has the authority to deny reasonable access to federal coal.

Other Mineral Related Impacts of the Roadless Area Conservation Rule

Stillwater Mining Company produces platinum and palladium from its mine located partially on Forest Service lands in Montana. Two of the roadless conservation areas cover portions of these reserves, which represent the only operating platinum/palladium mine in the Western Hemisphere. Even though Congress specifically drew the boundaries of the Absaroka–Beartooth Wilderness to exclude these important deposits, the roadless rule ignores this obvious congressional intent.

Platinum and palladium are critical elements in catalytic converters as well as components in high temperature and corrosion resistant alloys used in jet aircraft and other defense applications. The environmental, economic and national security implications of denying access to develop these unique and important deposits are significant.

Like coal underlying Forest Service lands, holders of federal phosphate leases will be limited in their ability to expand production levels beyond the boundaries of existing leases. The FEIS states that 873.3 million tons of phosphates not yet leased could be affected by the roadless rule and ideational amounts could be affected when land management plans are revised or amended. The cumulative impact of the increased energy costs and the escalated cost of fertilizer on western farmers and ranchers will be profound.

Conclusion

The Final Roadless Area Conservation Rule will clearly result in the loss of millions of tons of coal and phosphates, as well as substantial quantities of metallic and other hardrock minerals, that could otherwise be recovered from Forest Service administered lands. The economic impact on energy, agriculture and mining sectors is hundreds of millions of dollars. The cost/benefit analysis appears to under-estimate grossly the impact, and the Forest Service has ignored the cumulative effect the rule will have on sectors of the economy already reeling because of elevated energy costs.

In its evaluation of the adequacy of the regulatory framework for hard rock mining, the National Research Council stated:

> "The lack of information appeared to be greatest among highly placed officials who have the greatest need to know. Consequently, those responsible for regulatory management and change, and for keeping the public and Congress adequately informed, appear to be severely limited in their ability to do so." [2]

Although this observation was made in a different regulatory context, it is clearly applicable to the situation at hand.

The authors of the rule went to great pains first to dismiss then, when confronted, understate the impacts this rule will have on the Nation's ability to meet its energy needs. The agency completely ignored the existing regulatory scheme, including the Clean Water Act, the Endangered Species Act, the Surface Mining Control and Reclamation Act, and most notably the Wilderness Act, that protects the values this rule claims to defend. The price the entire Country will pay of this failure has already been witnessed in California and is spreading across the West.

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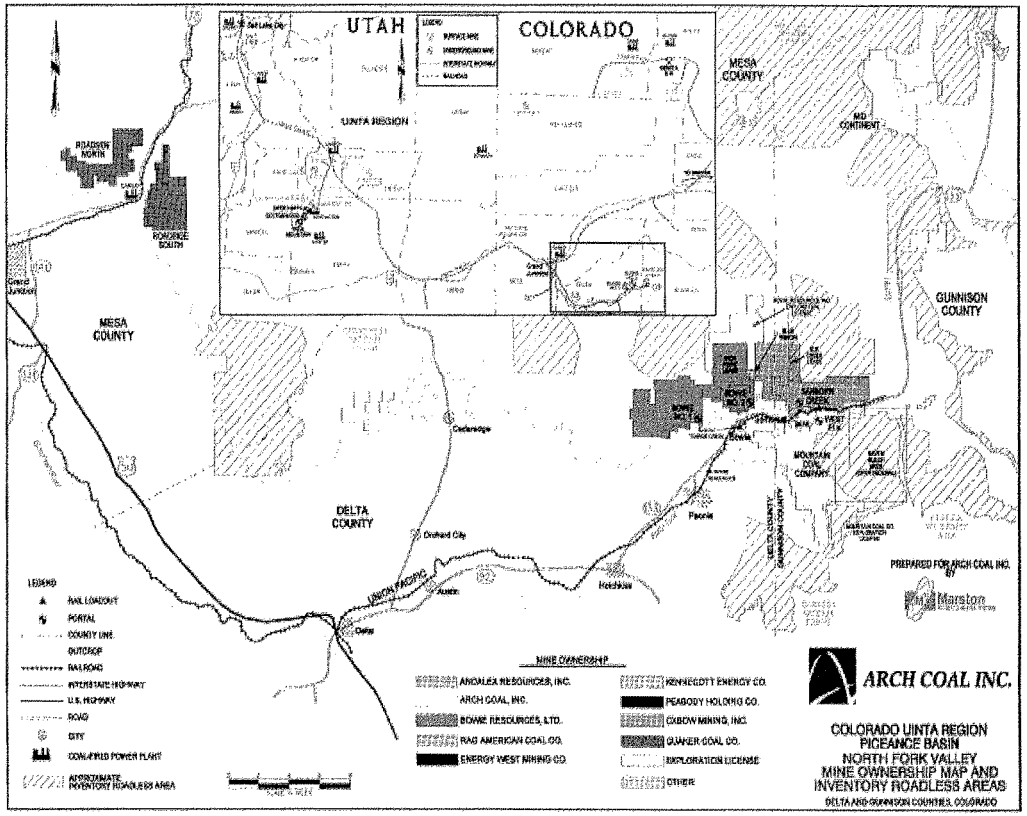
[2] Hardrock Mining on Federal Lands, National Research Council (September, 1999)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Bowie
Paonia
Orchard City
Hotchkiss
Delta
UNION PACIFIC
LEGEND
RAIL LOADOUT
PORTAL
COUNTY LINE
OUTCROP
RAILROAD
INTERSTATE HIGHWAY
U.S. HIGHWAY
ROAD
CITY
COAL-FIRED POWER PLANT
APPROXIMATE INVENTORY ROADLESS AREA
MINE OWNERSHIP
ANGLEX RESOURCES, INC.
ARCH COAL, INC.
BOWIE RESOURCES, LTD.
RAG AMERICAN COAL CO.
ENERGY WEST MINING CO.
KENNECOTT ENERGY CO.
PEABODY HOLDING CO.
OXBOW MINING, INC.
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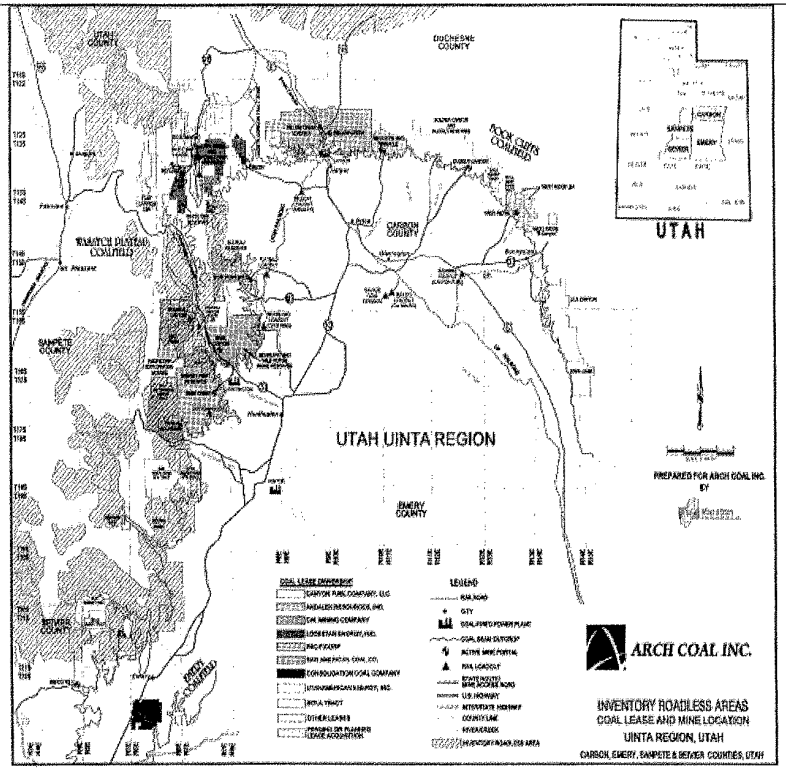
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UTAH UINTA REGION
EMERY COUNTY
BEAVER COUNTY
PARIA COALFIELD
UTAH
PREPARED FOR ARCH COAL INC.
BY
COAL LEASE OWNERSHIP
CANYON FUEL COMPANY, LLC
MIDCOAL ENERGY, INC.
CM MINING COMPANY
LOGAN RIVER ENERGY, INC.
PACIFICORP
RAG AMERICAN COAL, CO.
CONSOLIDATION COAL COMPANY
UTAH AMERICAN ENERGY, INC.
ROYALTRUST
OTHER LEASES
PENDING OR PLANNED LEASE ACQUISITION
LEGEND
RAIL ROAD
CITY
COAL FIRED POWER PLANT
COAL SEAM OUTCROP
ACTIVE MINE PORTAL
RAIL LOADOUT
STATE/COUNTY MINE ACCESS ROAD
U.S. HIGHWAY
INTERSTATE HIGHWAY
COUNTY LINE
RIVER/CREEK
INVENTORY ROADLESS AREA
ARCH COAL INC.
INVENTORY ROADLESS AREAS
COAL LEASE AND MINE LOCATION
UINTA REGION, UTAH
CARBON, EMERY, SANPETE & BEAVER COUNTIES, UTAH

Mr. PETERSON. Thank you.

Next we will hear from Mr. Pete Morton, a Resource Economist for The Wilderness Society.

STATEMENT OF PETE MORTON, RESOURCE ECONOMIST, WILDERNESS SOCIETY

Mr. MORTON. My name is Dr. Pete Morton. I am a natural resource economist in the Ecological and Economics Research Department of the Wilderness Society. We are a 200,000-member national conservation group focusing on public land issues. I appreciate the opportunity to testify today.

As you know, the Roadless Area Conservation Rule conserves approximately 57 million acres of the public estate managed by the U.S. Forest Service. Conserving these roadless areas will provide for multiple uses, multiple goods and services and multiple economic benefits for current and future generations. I would like to include for the record an endorsement letter from the Ecological Society of America, the world's premier society of professional ecologists, underscoring the scientific justification for the rule.

While gas is a clean-burning bridge fuel for the future, the drilling of gas generates significant ecological threats centered mostly on the daily discharge of thousands of gallons of water in the arid West. As a result of the drilling, aquifers are drained, water tables are lowered, drinking water wells dry up, flood risks increase for property located near discharge storage ponds, and the sudden influx of discharge water increases sediment loads that run into and damage fisheries.

Water discharged from coal bed methane wells, for example, is highly saline with a very high sodium absorption ratio. This ratio affects how water interacts with soil and can cause declining crop productivity for downstream farmers.

All these impacts carry price tags but they almost never are captured in cost-benefit analyses. Such costs need to be considered, especially since roadless watersheds provide clean water for hundreds of downstream communities and thousands of affected citizens.

Another problem would be landslides. In Colorado alone over a million acres of Forest Service roadless areas have high risk from landslides that dump tons of sediment into the water streams. A more detailed discussion of these uncounted costs are included in my written testimony.

I would like to now turn to the Wilderness Society's GIS analysis of oil and gas in roadless areas. Using a GIS intersection analysis of oil and gas plays with roadless areas, we estimate that roadless areas contain 4/10th of 1 percent of the nation's oil resources and 6/10ths of 1 percent of the gas resources. These numbers are estimated using USGS mean data.

These are the technically recoverable resources, which drop significantly when financial and economic factors are considered. Assuming companies would only extract those resources that would yield a profit, 73 and 55 percent respectively of the oil and gas is financially recoverable. When nonmarket costs from erosion, loss of habitat, et cetera are accounted for, these numbers drop even more.

With respect to the actual impacts from the Roadless Area Conservation Rule, it is important to note that 41 percent of the roadless areas already had management prescriptions developed through normal planning processes with local and national input that prohibited road construction. As such, examining the impact of the roadless rule should focus on the 59 percent of roadless areas where management prescriptions were actually changed.

In addition, 759,000 of roadless areas with high oil and gas potential are already under lease and would not be impacted by the roadless rule. The remaining land, much of which is on steep slopes, has been available for leasing for 60 to 70 years with little or no interest from industry. With more than 380,000 miles of road and the potential capability of slant-drilling to pump oil and gas four to six miles from a road, it is questionable whether road access is really a significant issue and whether there will be any negative impacts at all in terms of oil and gas. When these factors are considered, the negative impacts from the roadless rule are much, much less than have been estimated by the oil and gas industry.

And, as importantly, when estimating economic impacts it is vital to examine the net effects of the rule, fully accounting for the benefits; for example, the fishing and hunting benefits cited earlier by Mr. Moyer.

While economics should not drive public land management, when net impacts are considered I would agree with the conclusion of the Forest Service that the benefits of the Roadless Area Conservation Rule far outweigh the costs.

And finally, with respect to the current spike in energy prices, the quantities of oil and gas in national forest roadless areas are very small and will have absolutely no impact on energy prices that are set by global market forces. In addition, the oil and gas in roadless areas cannot be added to current production for at least five to 10 years.

Currently undiscovered gas reserves and expected growth in these reserves account for 42 percent of on-shore gas supplies in the U.S. It is these resources, the financially feasible gas resources in and around the already-discovered reserves, that have the potential to impact short-term energy prices, not the unknown small quantities of undiscovered gas resources in roadless wildlands far from existing pipelines.

Thank you for your time.

[The prepared statement of Mr. Morton follows:]

Statement of Peter A. Morton, Ph.D., Resource Economist, Ecology and Economics Research Department, The Wilderness Society

I am Dr. Peter Morton, Resource Economist in the Ecology and Economics Research Department for The Wilderness Society, a 200,000-member national conservation group that focuses on public land issues. I appreciate the opportunity to testify today regarding potential effects of oil and gas resource development in national forest roadless areas.

The Forest Service Roadless Area Conservation Rule has raised concerns by some over the economic impact of prohibiting road construction on domestic energy supplies. The environmental impact statement for the rule presents a good overview of the rule's potential effects on oil and gas development, including some detailed information on reasonably foreseeable development activities. The objective of this testimony is to evaluate the impacts—both positive and negative—of the Roadless Area Conservation Rule to provide decision-makers with additional information relevant to the current debate.

Economic Impacts from the Roadless Rule

The Roadless Area Conservation Rule conserves approximately 58.5 million acres of the public estate managed by the U.S. Forest Service. Conserving these roadless areas will provide for multiple uses, multiple goods and services, and multiple economic benefits for current and future generations. Roadless areas provide backcountry recreation opportunities, represent critical habitat for fish and wildlife—including threatened and endangered species, provide the scenic backdrop for motorized and non-motorized visitors outside roadless areas, generate ecosystem services such as carbon sequestration, natural pest control and watershed protection for local communities, and preserve the option of protecting additional wilderness for future generations. A letter from the Ecological Society of America (Attachment 1), the world's premier society of professional ecologists, underscores the scientific justification for the Roadless Area Conservation Rule.

Although roadless wildlands are highly valued by society, without formal markets, the benefits of wildland conservation are difficult to quantify in economic terms. As a result, non-market wildland benefits are typically under-produced by private landowners responding to market signals. This is a serious shortcoming as certain functions of nature, although they have no market value and their benefits are only partially understood, are necessary to keep America's market economy running. Public lands can help correct market failures by sustaining roadless wildlands that cannot survive the market forces driving private land use decisions. The failure of markets to protect roadless area benefits provides the economic justification for implementing the roadless rule.

The record number of public comments received by the Forest Service in support of the roadless policy provides empirical recognition and support for the multiple uses and benefits generated from roadless area conservation. While no quantitative estimate of the benefits of the rule was provided in the Roadless EIS, the Forest Service believes the benefits of the rule outweigh the costs (USDA Forest Service 2001, Regulatory Impact Analysis). In a more sophisticated analysis, Loomis and Richardson (2000) estimated that in their current, unroaded condition, the 42 million acres of Forest Service roadless wildlands in the lower 48 states can be expected to provide almost $600 million in recreation benefits each year, more than $280 million in passive use values, and nearly 24,000 jobs. The authors also estimated annual benefits from roadless area ecosystem services to include between $490 million and $1 billion worth of carbon sequestration services as well as $490 million in waste treatment services. Estimating the net impacts of the roadless rule should fully account for the benefits of conserving roadless areas as well as the potential costs with respect to the decline in quality and quantity of the other multiple uses generated by the public estate as a result of exploiting energy resources.

The Ecological Footprint of Oil and Gas Exploration and Drilling

Oil and gas drilling operations leave behind a large footprint on the landscape—a footprint that extends well beyond the several-acre drilling sites. Beginning with exploratory activities, large trucks with seismic surveying equipment crisscross the landscape using a crude system of poorly designed roads with at times little consideration for wetlands, storm water runoff or critical habitat. Exploratory drilling operations then require more large trucks with drill rigs using a network of constructed roads to access drill sites. If the exploratory well is determined to have no potential for production, the well is plugged, but the landscape scars remain. Depending on the agency with oversight, there is typically little enforcement or - monitoring of environmental regulations. In addition, no surety bonds are required for restoration or clean up.

If the well has potential for production, the well is cased with pipe and cemented (in an attempt to prevent oil and gas from seeping into nearby aquifers), and the drilling rig is replaced by a well head. Electric or gas powered motors are used to power the pumps that collect the gas at each well and to power the series of 24-hour compressor stations that pressurize gas for pipeline transport from the wells to customers in distant markets (WORC 1999). Many drill sites also involve the construction of sediment ponds and retention reservoirs to collect storm water drainage and store the ground water brought to the surface as a result of the drilling and extraction operation—the latter process is called dewatering. Injection wells are sometimes used to dispose of the water produced and to enhance oil and gas recovery—an action that may necessitate additional drilling of a few to hundreds of injection wells throughout the field (Gauthier-Warinner 2000). The ecological footprint not only extends across the forest and range landscape, it also penetrates to shallow aquifers as well as aquifers thousands of feet below the earth's surface.

Water and the Uncounted Costs from Oil and Gas Extraction

The major uncounted environmental cost associated with oil and gas drilling concerns water. National Forest roadless areas provide important watershed protection services for downstream communities, services that are negatively impacted by oil and gas drilling. In the lower 48 states, 55% of the watersheds that contain IRAs provide water to downstream facilities that treat and distribute drinking water to the public (LaFayette 2000, Watershed Health Specialist Report).

Greatly increased drilling activity for coal bed methane is having profound real life impacts on many families and communities in the West and illustrates well some of these impacts. In order to "release" the methane gas from coal beds, enormous amounts of ground water must be pumped from coal aquifers to the surface. The water discharged on the surface comes from shallow and deep aquifers containing saline-sodic water. The total amount of water produced from individual coalbed gas wells is generally much higher than that from other types of oil and gas wells (USGS 1995). Coal bed methane wells in Wyoming and Colorado discharge between 20,000 to 40,000 gallons per day per well, onto the ground surface (Darin 2000). The disposal of the water produced with coalbed gas not only affects the economics of development, but also poses serious environmental concerns. Water disposal can vary from inexpensive methods, such as discharge into streams, to more costly alternatives, such as underground injection and surface discharge after water treatment.

The amount of water discharged from CBM wells in Wyoming has skyrocketed in recent years, increasing from approximately 98 million gallons (300 acre feet) per year in 1992, to 5.5 billion gallons (17,000 acre feet) per year in 1999 (Wyoming State Engineer's Office cited in Darin 2000). The discharging of 17,000 acre feet of water in the arid west is wasteful in the short-term (generally an acre-foot of water will supply a family of four for one year), and has potentially devastating economic impacts for affected communities in the long-term. Dewatering of deep aquifers may upset the hydrologic balance, eliminating or reducing the availability of this water for future agricultural and domestic uses, as well recharge for shallow aquifers and surface water.

The discharge of ground water can deplete freshwater aquifers, lower the water table, and dry up the drinking water wells of homeowners and agricultural users. Monitoring of wells maintained by the BLM in the Powder River Basin, Wyoming already indicates a drop in the coal aquifer of over 200 feet (WORR 1999). The short-term economic costs include drilling new, deeper wells for current and future homeowners, ranchers and farmers, assuming successful wells can be found and/or the costs of relocating families to new homesites. If the freshwater aquifers do not fully re-charge, the long-term economic costs to affected landowners, homeowners, communities, and states across the west could be severe, including the foregone opportunity (option value) to use aquifer water in the future.

The water discharged from oil and gas wells is highly saline with a very high sodium absorption ratio (SAR)—a ratio that affects how water interacts with soil. Water with a high SAR can permanently change chemical composition of soils, reducing soil, air and water permeability and thereby decreasing native plant and irrigated crop productivity. Test results from water discharged from CBM wells from 3 sites in Wyoming all revealed SARs exceeding a level that could result in a 30-40% decrease in plant productivity (Powder River Basin Resource Council 2000).

The discharge of tens of thousands of gallons of ground water transforms many streams that normally flow intermittently only during spring runoff or after storms into all-season streams (Powder River Basin Resource Council 2000). The influx of water has resulted in deep channel scouring, erosion, and increased sedimentation. Increased sedimentation in streams can negatively impact native fisheries found in mainstream drainages with increased likelihood and financial costs from fishery restoration projects. The discharge of water into intermittent stream channels damages native flora and fauna not adapted to year-round water and promotes the spread of noxious weeds such as Scotch burr and Canadian thistle. The change in native vegetation composition, combined with the increase in noxious weeds, negatively impacts threatened and endangered species and other wildlife, as well as cattle. The loss of native species and the spread of noxious weeds across the west has enormous economic costs to the public and private interests.

The landscape is also impacted from the retaining ponds or reservoirs constructed to store the water discharged from the drilling operation. The constructed earthen dams and retaining ponds destroy additional habitat and introduce artificial structures to the landscape. Habitat and homes on property nearby reservoirs also have potential flood risk from structural failure of the poorly designed, quickly built retaining ponds and reservoirs during storm events, for example.

And finally, drilling for oil involves ecological risks and potential economic costs associated with blowouts—the catastrophic surge of the highly pressurized fluid from the drill hole that can cause fires, loss of life and property, and the potential contamination of surface drinking water sources. To reduce the number of blowouts, rotary drilling operations typically inject a fluid of drilling muds into the drill hole in order to lubricate and cool the drill bit. While reducing the number of blowouts, the drilling fluids themselves create a risk of contamination of adjacent freshwater aquifers (Gauthier-Warinner 2000).

The Uncounted Costs from Drill Sites, Pipeline and Road Infrastructure.

The exploitation of unconventional gas resources (e.g. continuous-type and coalbed methane) will require hundreds of thousand of wells to be drilled. Exploiting the gas in continuous-type deposits will also require drilling a significant number of wells, as these deposits are randomly distributed. Based on existing technology, the USGS indicates that nationwide approximately 960,000 productive wells will be required to recover potential gas reserve additions of 300 trillion cubic feet. However the habitat loss would not end there as extrapolation of present-day success ratios indicates that that roughly 570,000 "dry" holes would have to be drilled in addition to the productive wells—for a total of 1,530,000 drilling sites on public and private lands. Based on an industry report in Alaska (cited in NPC 1999) while past drilling pads consumed about 65 acres of habitat, recent operations average less than 10 acres. If we assume 5 acres per drilling pad and 1,530,000 drill sites, exploitation of just the continuous-type gas deposits would consume approximately 7.7 million acres of habitat on public and private land across the nation. As noted by the USGS (http://energy.usgs.gov/factsheets/GIS/gis.html), "land-use planners are not in a good position to determine the societal impacts of the drilling (density) that would be necessary if these continuous reservoirs of (tight) gas were exploited.—

In order to bring gas to market, thousands of miles of pipeline must also be constructed—extending the impacts of gas drilling far from the actual drill site. There are currently more than 270,000 miles of gas transmission pipelines and another 952,000 miles of gas distribution lines. The National Petroleum Council (1999) projects a need to build 38,000 and 255,000 miles of additional transmission and distribution pipelines, respectively, by 2015.

Oil and gas exploration also requires roads that increase ecological costs and invite cross-country travel and habitat damage by ORVs. Oil and gas drilling often require daily vehicular trips to monitor and maintain wells and pipelines. The increased traffic disrupts wildlife, may result in more road kill, and diminishes quality of life for local residents. The linear deforestation associated with road construction degrades habitat and fragments travel corridors needed by wildlife species such as grizzly bears, wolves, and other large, wide-ranging predators. Roads become conduits for non-native species that displace native species resulting in significant mitigation costs for taxpayers. Roads, by providing access, increase the frequency of human-caused fires. Humans cause ninety percent of all wildfires in the national forests; more than half of those wildfires begin along roads. In addition, roads increase the damage to historical, cultural and archeological resources due to increased ease of access.

Roads also increase sediment deposits in streams resulting in reductions in fish habitat productivity. In addition to keeping sediment from access roads and drill sites of community water sources, roadless areas protect communities from mass wasting (e.g. landslides). Mass wasting from landslides and debris flows is a key source of sediment, particularly in western forests, and many of the roadless areas are at high risk from landslides. In Colorado and Wyoming, for example, over 1,146,000 and 645,000 acres of roadless areas, respectively, have high susceptibility to landslides (Table 3). While landslides are a natural process, management activities like road construction and logging accelerate the incidence of mass wasting by several orders of magnitude (Swanson 1971, Anderson and others 1976, Swanson and Swanston 1976, Sidle and others 1985, Swanston 1991). For example, a joint FS and BLM study in Oregon and Washington found that of 1290 slides reviewed in 41 subwatersheds, 52% were related to roads, 31% to timber harvest, and 17% to natural forest (USDA Forest Service 1996 cited in LaFayette 2000, Watershed Specialist Report). The Forest Service concluded that the Roadless Area Conservation Rule "would have a considerable beneficial effect on water quality, particularly in Regions 1 and 4." (the Northern Rockies)

Table 3. National Forest Roadless Areas with High Landslide Susceptibility for Select States

State	Acres of Roadless Areas with high Risk of landslides*	Percent of FS roadless areas with high susceptibility to landslides
Colorado	1,146,000	33
Wyoming	645,000	21
Montana	564,000	15
Utah	492,000	14

*NOTE: This is a conservative estimate of roadless acres classified as highly susceptible to landslides, as these tot not consider the 21 million acres in roadless acres allocated to prescriptions that do NOT allow road construction a reconstruction, some of which have may high susceptibility to landslides (USDA FS Watershed Specialist Report

The uncounted economic costs from road construction for oil and gas drilling include increased ORV monitoring costs, increased frequency and costs of stream restoration projects, increased noxious weed mitigation costs, increased damage to archaeological sites and the decline in future benefits from visiting these sites, increased water treatment costs for downstream communities, and increased road maintenance and closure costs for taxpayers. On average, the annual maintenance cost of a mile of road is about $1,500 per mile (USDA FS 1999). Each new mile of road added to the FS transportation system competes for limited road maintenance funding, as Congressional funding is less than 20% of the funding necessary to maintain the existing road infrastructure. One must seriously question the wisdom of building more roads when current roads can't be maintained, and each year's unmet maintenance needs increase the backlog as roads deteriorate and the costs of repairs increase over time.

Examples of the economic costs from energy exploitation are summarized in Table 4 and should be included as part of the discussion on the net impacts from the Roadless Areas Conservation Rule. While many of these costs are difficult to estimate, academic and federal agency economists have made great advances in developing methods to value non-market costs and benefits. Included in the table are methods available for estimating the economic costs, to drive home the point that these costs are quantifiable and should be included in the economic calculus. Many heretofore-unquantifiable wildland benefits and costs are now quantifiable and available to agency officials responsible for developing the policies and procedures for guiding public land management. We therefore strongly encourage the USGS to internalize non-market costs into the cost functions used to estimate economically recoverable resources.

Table 4 The Uncounted Economic Costs of Mining, Oil and Gas Extraction

Cost Category	Description of Potential Cost	Methods for Estimating Cost
Direct Use	Decline in quality of recreation including hunting, fishing, hiking, biking, horseback riding.	Travel cost, contingent valuation surveys.
Community	Air, water and noise pollution negatively impacts quality of life for area residents with potential decline in the number of retirees and households with non-labor income, loss of educated workforce with negative impacts on non-recreation business. Decline in recreation visits and return visits negatively impact recreation businesses.	Surveys of residents and businesses. Averting expenditure methods for estimating costs of mitigating health and noise impacts. Change in recreation visitation, expenditures and business income. Documenting migration patterns.
Science	Oil and gas extraction in roadless areas reduces value of area for study of natural ecosystems and as an experimental control for adaptive ecosystem management.	Change in management costs, loss of information from natural studies foregone.
Off-site	Air, water and noise pollution affect quality of downstream and downwind recreation activities. Drilling rigs in viewsheds reduce quality of scenic landscapes, driving for pleasure and other recreation activities and negatively impacts adjacent property values. Groundwater discharged can negatively impacts adjacent habitat, property, and crop yields, while depleting aquifers and wells.	Contingent valuation surveys, hedonic pricing analysis of property values, preventive expenditures, well replacement costs, restoration and environmental mitigation costs, direct impact analysis of the change in crop yields and revenues.
Biodiversity	Air, water and noise pollution can negatively impact fish and wildlife species. Ground water discharged changes hydrological regimes with negative impacts on riparian areas and species. Road and drill site construction displaces and fragments wildlife habitat.	Replacement costs, restoration and environmental mitigation costs,
Ecosystem services	Discharging ground water negatively impacts aquifer recharge and wetland water filtration services. Road and drill site construction increase erosion causing a decline in watershed protection services.	Change in productivity, replacement costs, increased water treatment costs, preventive expenditures.
Passive use	Roads, drilling and pipelines in roadless areas results in the decline in passive use benefits for natural environments.	Contingent valuation surveys, opportunity costs of not utilizing future information on the health, safety and environmental impacts of oil and gas drilling.

Adapted from Morton (2000)

Preliminary Analysis of Oil and Gas Resources in National Forest Roadless Areas

As indicated by the Forest Service in the EIS for roadless rule, it is very difficult to evaluate the reasonably foreseeable potential for oil and gas development in Inventoried Roadless Areas (IRAs). While significant energy resources underlie some IRAs, there has been very little interest in leasing or drilling in roadless areas or other national forest lands. It is wildly unrealistic to estimate the potential economic impacts of protecting IRAs based on total quantities of oil and gas resources in IRAs. That is like estimating timber industry impacts based on the total number of board feet of timber in IRAs - a pointless exercise that would result in a grossly inflated and inaccurate economic impact estimate. While the EIS does not include extensive data on oil and gas resources in IRAs, it presents a realistic picture of the overall economic effects of prohibiting roads.

As a starting point in evaluating economic effects, The Wilderness Society undertook an assessment of the energy potential of federal lands in general and roadless areas specifically. The assessment included a GIS analysis of the oil and gas resources in national forest roadless areas for 6 states in the Intermountain West. These 6 states were selected as they represent the states with major oil and gas plays and they have significant acreage of national forest IRAs. Following are some preliminary results; we expect to have final results later this spring.

Data

We obtained data from the USGS 1995 National Assessment of United States Oil and Gas Resources, which divides the U.S. into eight regions and subdivides those regions into 72 geologic provinces, with each province containing a number of individual plays. Plays are defined by the USGS as a set of known or postulated accumulations of oil or gas that share similar geologic, geographic and temporal properties. A separate GIS coverage for each of the 199 plays in the six western states (North Dakota, Wyoming, Montana, Colorado, Utah and New Mexico) was obtained from the USGS in ARC/INFO export format (Weller 2001). These coverages define the boundaries of the oil and gas plays. The National Inventoried Roadless Areas

(IRA) GIS coverage was downloaded in ARC/INFO export format from the USDA Forest Service Roadless Area Conservation website. This dataset contains all National Inventoried Roadless Areas (IRAs) for the lower 48 states.

Methods

A Geographic Information System (GIS) and ARC/INFO software were used to determine the area of overlap between IRAs and oil and gas plays. The IRA coverage was clipped to the boundary of each of the six states in the study area to create an IRA coverage for each state. The state IRA coverages were then intersected with each play that falls within that particular state to identify the IRAs that overlap with each play. Plays could not be appended into a single oil and gas play coverage, because different plays are located within different geologic formations, and therefore their geographic boundaries often overlap each other.

The results of the intersection analyses were then used to calculate the number of acres of each play that lie within IRAs, as well as the number of acres of each individual IRA that overlap with different plays. The total acres of each play were also determined in order to obtain the percent of each play that coincides with IRAs. In order to estimate technically recoverable oil and gas resources in IRAs we multiplied the percentages by the estimated oil and gas resources for each play, taken from the USGS 1995 Assessment. Economically recoverable resources within IRAs were then estimated using a model based on the financial cost functions and recovery rates developed by the Attanasi (1998). Our estimates are based on the USGS mean value for each resource. USGS mean values represent the expected value and provide the best, unbiased estimate of oil and gas resources.

Results for Technically Recoverable Resources

The technically recoverable oil in national forest IRAs for the 6 states in the intermountain west are reported in Table 1. The technically recoverable resources are those that may be recovered using existing technology without regard to cost or profit. For this report, oil totals include both petroleum oil and gas liquids from conventional and unconventional sources. The 754 million barrels of technically recoverable oil represent only four-tenths of one percent (0.4%) of the nation's oil resources. The technically recoverable gas in the IRAs in the 6 western states is reported in Table 2. The 8.7 trillion cubic feet (Tcf) of gas in IRAs represents six-tenths of one percent (0.6%) of the nation's gas resources.

Table 1. Mean Estimates of Technically and Financially Recoverable Oil in Inventoried Roadless Areas on the National Forests

State	Technically recoverable oil (millions of barrels)	Technically recoverable oil as Percent of US Oil Resources (on and off-shore)	Financially Recoverable Oil at $18/barrel (Millions of barrels)	Financially Recoverable Oil at $30/barrel (Millions of barrels)
Montana	9	0.004	4	6
Wyoming	663	0.35	367	501
N. Dakota	13	0.007	1	3
Colorado	32	0.017	11	19
New Mexico	2	0.001	1	2
Utah	34	0.018	14	22
6-State Total	754	0.39	398	552

Results for Financially Recoverable Resources

The financially recoverable resources are that part of the technologically recoverable resources that can be recovered with a profit. To be considered financially recoverable the market costs of gas recovery must be less than or equal to the gas price (Goerold 2001). When financial criteria are considered, the oil and gas actually recoverable drops significantly (USGS 1998). For the lower 48 states, only 38 and 39 percent of the technically recoverable undiscovered oil and gas, respectively, can be extracted profitably when oil is $18 per barrel and gas is $2 per mcf (thousand cubic feet). At $30 per barrel and $3.34 per mcf, two-thirds of the technically recoverable oil and gas is financially profitable to recover (Attanasi 1998).

Financial recovery rates are even less for unconventional oil and gas resources (continuous-type gas and coal bed gas) than for the conventional resources. For continuous-type gas, only 7 and 15 percent of the technically recoverable gas is financial to find, develop and produce at $2/mcf and $3.34/mcf, respectively (Attanasi 1998). For continuous-type oil accumulations at $18 and $30 per barrel, about 7 per-

cent and 50 percent, respectively, of the technically recoverable oil is financially feasible to exploit (Attanasi 1998). For unconventional coal bed gas, about 30 percent of the technically feasible gas is financially recoverable at $2 per mcf, while at $3.34 per mcf, the financial portion increases to slightly more than 50 percent (Attanasi 1998).

The financially recoverable oil in IRAs on the national forests is shown in Table 1. Assuming oil prices of $18 or $30 per barrel, oil in the IRAs of these 6 states would meet total U.S. oil consumption for approximately 21 or 29 days, respectively (e.g. 552/18.92=29). When financial factors are considered the quantity of gas available also drops dramatically (Table 2). At $2 and $3.34 per thousand cubic feet (mcf), the financially recoverable gas in these IRAs would meet total U.S. gas consumption for approximately 2 or 3 months, respectively.

Table 2. Mean Estimates of Technically and Financially Recoverable Gas in Inventoried Roadless Areas on the National Forests

State	Technically Recoverable Gas (Trillion Cubic Ft.)	Technically Recoverable as Percent of US Gas Resources (on and off-shore)	Gas Financially Recoverable at $2/mcf (trillion cubic feet)	Gas Financially Recoverable at $3.34/mcf (trillion cubic feet)
Montana	0.405	0.029	0.191	0.256
Wyoming	5.278	0.386	2.108	2.798
N. Dakota	0.125	0.009	0.006	0.013
Colorado	2.336	0.171	0.885	1.363
New Mexico	0.067	0.005	0.019	0.026
Utah	0.486	0.036	0.224	0.332
6-State Total	8.696	0.636	3.446	4.782

The financially recoverable totals reported above are based on USGS estimates of economically recoverable resources. The costs that the USGS uses in assessing the costs of oil and gas production include items such as the direct costs of exploration, development and production of gas. Not included in the USGS calculus are non-market costs such as the off-site ecological costs and cumulative negative environmental impacts that might result on a public resource such as a watershed (Goerold 2001). An economic analysis of benefits and costs must account for non-market benefits and costs, as well as those more readily observed and measured in market prices (Loomis and Walsh 1992; Pearse 1990). An economic analysis is conducted from the viewpoint of society, which should also be the viewpoint of politicians and managers of the public estate. In contrast, a financial analysis only examines costs and benefits as measured by market price; it is the viewpoint of private industry and is more concerned with profits or losses.

The USGS economically recoverable analysis more closely resembles a financial analysis than an economic analysis. A more accurate estimate of the economically recoverable resources from a public perspective should include a full accounting of non-market costs. If economic analysis accounted for the uncounted, non-market costs discussed earlier, the quantities of oil and gas estimated to be economically recoverable would be much less than reported here.

Energy Impacts from the Roadless Area Conservation Rule are Minimal

As discussed earlier, raw estimates of technically or financially recoverable oil and gas resources do not provide even a remotely accurate measure of the reasonably foreseeable economic effects of roadless area protection. For example, the roadless area conservation rule conserved approximately 58.5 million acres of public wildlands on the national forests. However, the roadless rule would not change management prescriptions on 24.2 million acres, representing 41% of the IRAs. There would be no impacts from the roadless rule on these acres as existing land management plan prescriptions already prohibit road construction (USDA Forest Service 2001). The policy discussion on impacts of the roadless rule should therefore focus on the 59% of the IRAs where management policy was actually changed as a result of the final rule.

Furthermore, the oil and gas industry has demonstrated little interest in exploiting potential energy resources in IRAs. Because of the downturn in the domestic oil and gas economy, the amount of National Forest System land under oil and gas lease dropped from about 35 million acres in the mid-1980s to 5.8 million acres in 1998 (USDA Forest Service 2000). The national forests are not a major supplier of gas. In 1999, the National Forest system produced about 0.4% of the nation's gas supply, with about half of that total coming from Little Missouri Grasslands (USDA Forest Service 2000). As such the impacts on current and reasonably foreseeable supply from a change in national forest management are minimal.

Most roadless areas have been available for leasing for decades. Extensive portions of the lands which the oil and gas industry believes have high potential are already under lease and therefore would not be affected by this rule. Currently 759,000 acres of IRAs with high oil and gas potential are under lease (USDA Forest Service 2001). Most of these areas are within the Intermountain, Northern, and Rocky Mountain regions. Existing leases are not subject to the prohibitions. The roadless rule would have no effect on existing oil and gas leases. In fact, it provides for future leasing, with roadbuilding, on lands currently under lease. This exception will reduce economic impacts on current operators, by avoiding the possibility of increasing the costs of production or precluding future development on the lease if restrictions had been applied at the time of lease extension or renewal.

In addition, just because an IRA is off-limits to road construction does not mean that underlying energy resources are impossible to develop. The roadless rule could affect extraction of oil and gas in IRAs in the future where road construction is required. However, this impact can be minimized by the use of extended reach drilling and other technological improvements that can allow access to oil and gas resources 5-6 miles from the drilling site (NPC 1999). With 380,000 miles of roads and an extended drilling reach of 5-6 miles, it is questionable whether lack of additional road access is really a significant issue.

Public concerns and environmental safeguards for protecting sensitive lands and resources are also key factors limiting oil and gas development. While standard leases govern gas drilling on 59% of Federal land in the Rocky Mountain region, only 9 percent of the federal land in the region is actually off limits while 32 percent is subject to access restrictions (NPC 1999). These restrictions are not, however, without purpose. For example, seasonal closures designed to protect wildlife populations may slow down the rate of gas exploitation but protect the wildlife and other multiple-uses under which public land is managed. Such protection is warranted economically, as watershed protection, hunting, fishing and recreation generate significantly more economic benefits to all Americans, including affected residents and business in the Rocky Mountain Region, than oil and gas extraction. Legislative intent and public sentiment indicate that public lands should not be for the exclusive use of the oil and gas industries and that managers must attempt to balance the many uses that occur on public land. Environmental restrictions help internalize the uncounted costs from oil and gas extraction mentioned previously by protecting other multiple uses enjoyed by the public.

With respect to energy prices, the quantities of financially recoverable oil and gas in IRAs are very small and will have no impact on energy prices that are set on the world market. Extracting or not extracting oil and gas in IRAs will have absolutely no impact on short-term energy prices since IRAs resources could not be added to current production for at least 5-10 years (USDA Forest Service 2001). In addition, a substantial amount of undiscovered, unconventional gas resources in the IRAs are categorized by the USGS as hypothetical resources and are associated with higher extraction costs than conventional resources. Producers have limited ability to exploit hypothetical sources within an expedient time frame. The hypothetical nature of much of the unconventional resource underscores the inability of IRA oil and gas resources to impact current energy prices.

The oil and gas resources that may affect energy prices already exist in discovered known reserves and in the growth of these reserves. Currently discovered reserves and expected reserves growth account for 42% of U.S. onshore gas supplies (USGS 1995). It is these resources, the financially feasible gas resources in and around the already discovered reserves, that have the potential to impact short-term energy prices—not the unknown and hypothetical, small quantities of undiscovered gas resources in roadless wildlands far from existing pipelines.

Conclusion

Based on our analysis, The Wilderness Society concludes that IRAs hold very small quantities of oil and gas, and drilling in IRAs on the national forest is economically inefficient and will do nothing to reduce current energy prices for consumers. While economics should not be the driving force behind public policies, we agree with the Forest Service conclusion that IRAs should be protected from oil and gas drilling as the benefits of the Roadless Area Conservation Rule outweigh the costs. While The Wilderness Society also agrees that gas is the bridge fuel for the future, it is important to recognize that the extraction of gas, a cleaner burning fuel than coal, involves significant ecological and economic costs. It is important for the public to be aware of these costs and internalize them into their public land management and energy consumption decisions. The United States has less than 5 percent of the world's population but consumes 40% of the oil and 23% of the gas (USGS 2001). As such there is much we as a nation can do via investments in en-

ergy conservation and renewable energy to reduce our consumption, and the ecological and economic costs associated with our consumption levels (NRDC 2001).

We strongly support the Roadless Area Conservation Rule's prohibition on road construction for oil and gas development and other forms of resource extraction. At the same time, we believe the protection of roadless areas should not be used as an excuse to exacerbate the impacts of drilling for gas next to homes or private property where the families do not own the sub-surface mineral rights (i.e. split estate). We recommend a programmatic EIS on gas drilling where it is adversely affecting homeowners, ranchers, and communities. Such an approach in needed until adequate baseline conditions are firmly established and funding is obtained for long-term monitoring and mitigation to assess and minimize environmental impacts and long-term costs. Such a comprehensive approach is desperately needed in Wyoming where gas drilling, especially drilling for coal bed methane, is causing extreme damage to water supplies and other environmental values.

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[Letter from The Ecological Society of America submitted for the record follows:]

The Ecological Society of America
1707 H Street NW
Suite 400
Washington, DC 20006-3915

December 16, 1999

Chief Michael Dombeck
U.S. Forest Service
201 14th and Independence SW
Washington, DC 20250

Dear Chief Dombeck:

As President of the Ecological Society of America, the nation's premier Society of professional ecologists, I write to applaud your efforts to incorporate biological and ecological criteria in managing the nation's forests and grasslands. Roadless areas act as refuges for sensitive plants and animals and serve as genetic reservoirs. Roadless areas also provide ecosystem services, including drinking water for humans. In addition, these areas serve as important reference areas for research on how ecological processes work.

The current network of forest service roads affects a large portion of national forest lands. Direct effects of roads on ecosystems are well documented. Their impact varies depending on road density, location, type and levels of use and maintenance. The areas of greatest concern are the most fragile ecosystems or areas of critical importance to aquatic and terrestrial wildlife. The current state of scientific knowledge about effects of roads includes:

Water Degradation--Roads contribute sediment to water bodies such as streams which can degrade the water quality and damage aquatic life. Roads can also disrupt natural streamflows leading to changes in flood peak, changes in the speed at which the water flows, and water temperatures. All of these can negatively affect animals including invertebrates, amphibians, and fish, such as trout and salmon.

Biological Invasion--Roads can enable invasive plants and animals, many of which are non-native, to expand their ranges. Exotic species often thrive in the environments created by roads and can also be inadvertently transported by vehicles. Examples include: weeds, such as spotted knapweed; aggressive brood parasites, such as the brown-headed cowbird; and pathogens, such as Port-Orford cedar root rot).

Habitat Fragmentation--Roads create open edges to forests which can make species more vulnerable to disturbances such as windthrow, pest epidemics, invasion by nonnative species, and nest parasitism. In addition, roads can break up local populations of smaller animals and plants, in some cases bringing about local extinctions. Finally, roads can alter the behavior and movement patterns of large animals, such as elk, wolves, and bears, who may avoid suitable habitat because of its proximity to roads.

Human-caused fire--Most fires are caused by people and over half of these begin in the vicinity of roads. While fire is a natural process, the frequency and timing of fires plays an important role in how the landscape responds.

Phone: 202 833 8773 • Fax: 202 833 8775 • Email: esahq@esa.org • Web: http://esa.sdsc.edu/

ESA's 7,500 members are experts in a host of areas relevant to the development of the scope and content of the Administration's Roadless Intiative and we have asked them to provide your agency with comments. If the Ecological Society of America can be of service, or if you would like us to provide you with the contact information of members with expertise in this area, please contact our Director of Public Affairs, Nadine Lymn (202.833.8773, extension 205; nadine@esa.org).

Sincerely,

Diana H. Wall

Diana H. Wall
President

cc: USDA Forest Service-CAET
Attention: Roadless Areas NOI
P.O. Box 221090
Salt Lake City, UT 84122

Mr. PETERSON. Thank you very much.

Mr. Phillips, I missed your testimony but can you explain to us what kinds of activities you foresee happening on these large roadless areas and how it will differ what happens on wilderness areas?

Mr. PHILLIPS. Before I do, it is nice to see you again. I enjoyed our conversations last year on gateway visitor centers. Hopefully we can continue that discussion.

Mr. PETERSON. Yes.

Mr. PHILLIPS. The roadless rule, which is under review by the administration, essentially prohibits construction and reconstruction of new roads. Activities that have occurred in the past on roads that are currently open will be allowed to continue. Current leases that exist in the roadless areas would be continued and allowed to renew those leases but only in the leased area.

Mr. PETERSON. What percentage of the 59 million acres do you think has a lot of roads in them?

Mr. PHILLIPS. Has a lot of roads?

Mr. PETERSON. Yes, substantial amounts of roads, existing roads.

Mr. PHILLIPS. About 2.8 million acres of the 58.5, I believe.

Mr. PETERSON. So a very small percentage has roads in it.

Mr. PHILLIPS. Correct.

Mr. PETERSON. So 2.8 from 59 is 56 million does not have roads.

So I guess my question then is what kind of activity do you see happening in the 56 million acres that are roadless and will remain roadless?

Mr. PHILLIPS. They will still be open to many of the multiple use activities.

Mr. PETERSON. Such as?

Mr. PHILLIPS. Trail use.

Mr. PETERSON. Hiking?

Mr. PHILLIPS. Yes.

Mr. PETERSON. What else?

Mr. PHILLIPS. Mountain biking, snowmobiling.

Mr. PETERSON. Well, not if some people have their way.

Mr. PHILLIPS. And, as I said, existing leases, general leases.

Mr. PETERSON. I am a hunter, fisherman, hiker, but when you get beyond the age of 35 or 40, I do not find many people go very far from a road. I guess that is the part that has puzzled me with this. If this is public land for public use, forgetting all about resources, just public use, if that great percentage of this is still roadless, in a way I guess we are calling it wilderness.

Most people, and hunters are probably a little less fearful than the average citizen—if you have ever been up in a small plane in hunting season and look where the orange suits are against the white snow, you go a mile from a road and you see very few orange suits. Go two miles from a road and you may see one occasionally. Go five miles from a road and you do not see anybody.

Today's adults are not comfortable that far from a road. They are not that experienced about being out in the woods in the wilderness. I guess that is the part that bothers me, is are we not locking it up from public use, period? It would be interesting to look where five miles would take you but I would say the average citizen would not go five miles from a road An average young robust cit-

izen is not going to go five miles from a road. You have campers and hikers that will go anywhere but they are the minority. That is just a very small percentage of it population.

Let us be honest. Are we just locking it up for the critters? Is half the Forest Service for the critters?

Mr. PHILLIPS. I guess the only way I could respond is to say that there will be a lot of uses that could occur out there.

Mr. PETERSON. Could, but would they?

Mr. PHILLIPS. Depending on your ability to use that land, yes.

Mr. PETERSON. But it is certainly not for senior citizens, who would be careful about hiking five miles with potential health problems. It certainly is not going to be for people who have not been taught about the forest and how to get back to where you came from.

I could get my father lost and he spent a lot of time in the woods but for some reason he did not have a good sense of direction and I could get him lost any time I wanted to hiking in the woods because he would just get lost; that is all. I would hear him whistling pretty soon and he needed help to figure out which hill we went around to get back out of there.

I guess I was just wanting to make that point, that the roadless issue sounds good to some people but I guess in my view I think there is going to be very limited people-use. And I think to take half of the Forest Service land and lock it up to where it is almost not usable by the average citizen is a policy I do not think is well thought through. That is my own personal view.

How will the Forest Service assure legal access to state and private lands within or adjacent to roadless areas?

Mr. PHILLIPS. I think the roadless rule, we have tried to be clear that there has been no intent to exclude or deny legal access to people's lands. So given that, in-holdings, those kinds of private uses would still be granted access.

Mr. PETERSON. Do you have any estimate on the amount of biomass on the national forest that could possibly be used for energy production and how much of this is on the roadless areas?

Mr. PHILLIPS. I do not. I believe this Committee addressed that yesterday in a hearing but I do not have that information. We can certainly try to get that to you.

Mr. PETERSON. I have an eight-page letter dated July 17, 2000 from the Office of Advocacy of the Small Business Administration to the Associate Chief of the Forest Service. The letter raises concerns about the adequacy of economic analysis of the draft roadless rule.

I understand that this watchdog for the small business community continued to work with Forest Service personnel about better assessing the roadless rule's economic impacts before the rule went final. Can you provide for the record copies of any or all correspondence with the Office of Advocacy regarding the Roadless Area Conservation Rule or broader transportation policy?

Mr. PHILLIPS. Certainly.

Mr. PETERSON. I will submit the letter dated July 17 for the record.

[The requested materials follow:]

July 17, 2000

VIA ELECTRONIC &
REGULAR MAIL

Hilda Diaz-Soltero
Associate Chief
United States Department of Agriculture
Forest Service
Washington, DC
Email: roadlessdeis@fs.fed.us

Dear Ms. Diaz-Soltero:

As stated in previous correspondence on this issue, the Office of Advocacy of the U.S. Small Business Administration (SBA) was established by Congress under Pub. L. No. 94-305 to represent the views of small business before federal agencies and Congress. Advocacy is also required by §612(a) of the Regulatory Flexibility Act (RFA) (5 U.S.C. 601-612) to monitor agency compliance with the RFA. In that Advocacy is an independent office within SBA, the comments provided are solely those of the Office of Advocacy and do not necessarily reflect the views of SBA.

A Brief Review of RFA Compliance Requirements

Initial Regulatory Flexibility Analysis

The RFA requires agencies to consider the impact that a proposed rulemaking will have on small entities. If the proposal is expected to have a significant impact on a substantial number of small entities, the agency is required to prepare an initial regulatory flexibility analysis (IRFA) describing the reasons the action is being considered; a succinct statement of the objectives of, and legal basis for the proposal; the estimated number and types of small entities to which the proposed rule will apply; the projected reporting, recordkeeping, and other compliance requirements, including an estimate of the small entities subject to the requirements and the professional skills necessary to comply; all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule; and the significant alternatives that accomplish the stated objectives of the of the statues and that minimize any significant economic impact of the proposed rule on small entities. 5 U.S.C § 603. The analysis or a summary of the analysis must be published with the proposal for public comment.

Final Regulatory Flexibility Analysis

When an agency issues any final rule, it must prepare a final regulatory flexibility analysis (FRFA) when a rule will have a significant economic impact on a substantial

number of small entities. The FRFA must discuss the comments received, the alternatives considered and the rationale for the final rule. Specifically, each FRFA must contain a succinct statement of the need for and objectives of the rule; a summary of the significant issues raised by public comments in response to the IRFA; a summary of the agency's assessment of such issues and a statement of any changes made in the proposed rule as a result of such comments; a description and an estimate of the number of small businesses to which the rule will apply or an explanation of why no such estimate is available; a description of the projected reporting, recordkeeping and other compliance requirements of the rule, including an estimate of the classes of small entities that will be subject to the requirement and the types of professional skills necessary for the preparation of the report or record; and a description of the steps the agency has taken to minimize the significant economic impacts on small entities consistent with the stated objectives of applicable statutes, including a statement of the factual, policy and legal reasons for selecting the alternative adopted in the final rule, and the reasons for rejecting each of the other significant alternatives. In complying with the provisions of section 603 and 604 of the RFA, an agency may provide either a quantifiable or numerical description of the effects of a proposed rule or alternatives to the proposed rule, or more general descriptive statements if quantification is not practicable or reliable. 5 U.S.C. § 607.

Certification in Lieu of a Regulatory Flexibility Analysis

If the proposed or final rulemaking is not expected to have a significant economic impact on a substantial number of small entities, 5 USC §605 of the RFA allows an agency to certify a rule, in lieu of preparing an IRFA or FRFA. If the head of the agency makes such a certification, the agency shall publish such a certification in the Federal Register at the time of the publication of the general notice of proposed or final rulemaking for the rule along with a statement providing the factual basis for the certification. See 5 U.S.C. §605(b).

The Proposed Rulemaking

Because of the nature of this rule, the Office of Advocacy consistently maintained in its pre-proposal comments to the Forest Service (FS) that certification was inappropriate from a public policy standpoint. On May 10, 2000, FS published a proposed rule in the *Federal Register*, Vol. 65, No. 91, p.30276 on *Special Areas; Roadless Area Conservation*. The purpose of the proposal is to protect the environmental resources in national forests by prohibiting road construction and reconstruction in most inventoried roadless areas of the National Forest System and require the evaluation of roadless area characteristics in the context of overall multiple-use objectives during land and resource management plan revisions. The intent of the rulemaking is to provide lasting protection in the context of multiple use management for inventoried roadless areas and other unroaded areas within the National Forest System. Id.

Prior to the proposal, the Office of Advocacy worked with FS in an effort to assist FS with RFA compliance. Throughout the process, FS has maintained that it believed that the proposed rulemaking would not have a significant economic impact on a substantial number of small businesses. FS has also contended that the proposed rule does not

directly regulate small entities and, therefore, an IRFA was not necessary. Nevertheless, FS prepared an Initial Regulatory Flexibility Analysis (IRFA) at Advocacy's request. Because FS did not have sufficient economic information to prepare a complete IRFA, Advocacy advised FS to include a list of questions in the IRFA to solicit from the public information on the economic impacts of the proposal. FS complied with this request also.[1] *See*, Fed. Reg. at 30285-30286.

FS Should Abandon Its Assertion that the Rule Does Have a Direct Impact on Small Entities

As stated above, FS has consistently asserted that a regulatory flexibility analysis is not required since the proposal does not have a direct impact on small entities. It is Advocacy's understanding that the basis of the assertion is that the proposal establishes procedures, and nothing more, to be followed in local forest planning processes. Local FS offices will maintain the authority to determine the actual forest plan; hence national FS is not directly regulating small entities. Consequently, a regulatory flexibility analysis is not required.

Advocacy acknowledges that there is case law that states that the RFA only requires an agency to perform a regulatory flexibility analysis of small entity impacts when a rule directly regulates them. However, Advocacy asserts that the cases are inapplicable to FS' proposal. If anything, the case law and the facts support a finding that the impact of the proposal is indeed direct, not indirect.

The primary case on the consideration of direct versus indirect impacts for RFA purposes in promulgating regulations is Mid-Tex Electric Co-op Inc. v. F.E.R.C., 249 U.S. App. D.C. 64, 773 F.2d 327 (1985). In Mid-Tex Electric Co-op Inc. v. F.E.R.C., FERC ruled that electric utility companies could include in their rate bases amounts equal to 50% of their investments in construction work in progress (CWIP). In promulgating the rule, FERC certified that the rule would not have a significant economic impact on a substantial number of small entities. The basis of the certification was that virtually all of the utilities did not fall within the meaning of the term small entities as defined by the RFA. Plaintiffs argued that FERC's certification was insufficient because it should have considered the impact on wholesale customers of the utilities as well as the regulated utilities. The court dismissed the plaintiffs' argument and concluded that an agency may certify that no RFA analysis is necessary when it determines that the rule will not have a significant economic impact on a substantial number of small entities that are not subject to the requirements of the rule. Id. at 64.

The US Court of Appeals for the District of Columbia applied the holding of the Mid-Tex case in American Trucking Associations, Inc. v. U.S. E.P.A., 175 F.3d 1027, 336 U.S.App.D.C. 16 (D.C.Cir., May 14, 1999) (hereinafter ATA). In the ATA case, EPA

[1] Usually, the Office of Advocacy does not publicize its interaction with an agency during the prior to the proposal of a rule. However, since Forest Service has agreed to release communications that it had with the Office of Advocacy to House Committee on Small Business, Subcommittee on Rural Enterprises, Business Opportunities, and Special Programs, the communications are now part of the public record.

established a primary national ambient air quality standards (NAAQS) for ozone and particulate matter. At the time of the rulemaking, EPA certified the rule pursuant to 5 USC § 605(b). The basis of the certification was that EPA had concluded that small entities were not subject to the rule because the NAAQS regulated small entities indirectly through the state implementation plans (SIPs). Id. Although the Court remanded the rule to the agency, the Court found that EPA had complied with the requirements of the RFA. Specifically, the Court found that since the States, not EPA, had the direct authority to impose the burden on small entities, EPA's regulation did not directly impact small entities. The Court also found that since the states would have broad discretion in obtaining compliance with the NAAQS, small entities were only indirectly affected by the standards. Id.

In Mid-Tex, compliance with FERC's regulation by the utilities would have a ripple effect on customers of the small utilities. There were several unknown factors in the decisionmaking process that were beyond FERC's control like whether utility companies had investments, the number of investments, costs of the investments, the decision of what would be recouped, who would the utilities pass the investment costs onto, etc. In this instance, FS is the ultimate decision-maker and its decisions will have a direct effect on known small entities that have profited from multiple use of FS' lands in the past or which planned to profit from the resources in the future.

Likewise, this matter is distinguishable from the ATA case. Unlike the ATA case, where EPA was setting standards for the States to implement under state regulatory authority, FS is developing a framework for the local/regional FS offices to use in adopting multiple use plans for national forests. The fact that it is a local office of FS versus the national office of FS is inconsequential. In either event, FS will implement the rule, not a third party entity. Regardless of where the office is located, FS is making the ultimate decision of whether a road will or will not be constructed. The proposed rule clearly states that roads may not be constructed or reconstructed in the unroaded portions of inventoried areas of the National Forest System unless the road is needed for public safety, for environmental response or restoration, for outstanding rights or interests protected by statute or treaty, or to prevent irreparable resource damage. See, Section 294.12 , Fed. Reg., p. 30288.

Direct Impacts on Small Entities

Moreover, small entities will be directly affected as a result of FS' decisions. The word "direct" is defined as "to regulate the activities or course of action thereof; stemming immediately from a source, cause, or reason; operating without agency or step...".[2] Small entities that already operate in national forests will have their operations seriously curtailed. (FS recognizes that the majority of these entities are small.) These and others, like the construction companies that build the roads, may have developed their business plans based on expectations of continued access and as a result of previously published FS plans. These impacts need to be evaluated. FS has some data already that would allow it to do so. For example, according to Tables 4 and 6 of the IRFA, the proposal

[2] The Merriam Webster Dictionary.

estimates that there will be a 45% reduction in forest harvest in the Manti-Lasal National Forest alone in Utah. Other forests, such as Dixie (Utah) and Shoshone (Wyoming) will experience reductions in harvest that exceed 20%. In Montana, the Helena Forest will experience a reduction in total harvest volume of 12%. In those same areas of the country, FS controls more than 50% of the forested land base.[3] For example, FS controls 52.3% of forested land in Montana; 66.6% of the land in Wyoming; and 68.5% of the forested land in Utah.[4] Considering the vast amount of area owned by the FS, moving to or procuring from another location to harvest or process natural resources may be unrealistic or a short term solution. The end result of this proposal may be the ultimate demise of small businesses and small governmental jurisdictions that rely on the resources.

Advocacy recognizes that there is a substantial public policy interest in maintaining the natural beauty of the national forests and protecting the environmental resources found in the national forests. However, just these few examples indicate that the overall impact of this initiative could be economically devastating to many small businesses. The high percentage of reduction, combined with the fact that FS owns such a high percentage of the land in some areas, indicates that this rule may have a direct economic effect that cannot be recouped at other locations by the small entities that rely on them. Since the FS has some data, and will receive additional data from the comment period, it is not plausible for FS to continue to maintain that the proposal will not have a direct effect on small entities.[5]

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[3] Testimony of Mr. Frank Glatics, President of Independent Forest Product Association, before The House of Representatives Subcommittee n Rural Enterprises, Business Opportunities, and Special Business Programs, Tuesday, July 11, 2000, pp. 9-10.

[4] Id.

[5] Advocacy notes that FS may be arguing that the RFA does not apply because the use of FS property for harvesting natural resources is a future activity that may or may not occur, depending on the decision of the forest planners. While this argument may have some validity, it is not necessarily convincing. Some of the land that is being placed off limits by the initiative was originally targeted for resource harvesting. As a result of this rule, forest planners will not be able to allow the original tentative multiple use plans to be implemented. Small entities may have relied on the original plans in making business decisions. This issue should be addressed.

Information Provided By the Public Must Be Addressed in the FRFA

At the time of the proposal, FS asserted that they could not perform a complete IRFA because it lacked sufficient economic information about the economic impacts on the industry. Because its information was insufficient, FS provided a list of questions in an attempt to obtain the necessary information from the public. In reviewing the comments from the public, Advocacy hopes that FS will give full consideration to the information provided by the industry in response to FS' solicitation for additional information and perform an analysis that reflects 1) the impact on small entities that had access to resources that will have limited or no access after the rulemaking; 2) the impact of the regulation on small entities that were relying on future activities that will not occur as a result of the regulation; and 3) the impact of the regulation on activities outside of the FS lands (i.e. small communities).

Since our comments are being submitted prior to the close of the comment period, we cannot comment on the full scope of the information that FS may receive from the public regarding the economic impacts of this rule. However, we have received some information from the industry about potential impacts. The early information received indicates that the impact may in fact be significant. For example, representatives of the timber industry, which FS acknowledges is primarily dominated by small businesses, assert that FS controls 73.3% of the saw timber in Montana; 80.8% of the saw timber in Wyoming; and 85.4% of the timber volume in Utah.[6] In the IRFA, FS asserts that the reduction in harvest as a result of this rule could range from 1 to 8% depending on the location[7]. Fed. Reg. at 30286. Considering the high dependence on FS timber in certain areas, a 1 to 8% reduction could be economically significant. If not, FS needs to provide data showing why it is not economically significant to support its conclusion in the FRFA.

Moreover, the mining industry has indicated that the proposal disallows mining on 43 million acres of federal land. It asserts that more than $7 trillion dollars of coal and metal resources will be placed off limits by the proposed rule.[8] If this is not correct, then FS must explain why these resources will still be available and the approximate costs of obtaining access to the resources in areas where road construction and reconstruction is prohibited.

Economic effects such as these cannot be ignored. These early numbers indicate that the impact may indeed be significant. FS needs to explain why they are not significant and provide this information to the public. On the other hand, if the analysis indicates that the impact is indeed significant, Advocacy asserts that FS must fully address this in the FRFA and possibly repropose the rule.

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[6] Id.

[7] On the surface, the percentages in the IRFA summary appear to be inconsistent with the tables found in the IRFA. FS needs to explain the inconsistencies found in the documents.

[8] Testimony of Laura Skauer, Northwest mining Association

Alternatives Provided By Public Must be Given Full Consideration

The RFA requires an agency to consider alternatives to the proposal and provide a statement of the factual, policy and legal reasons for selecting the alternative adopted. 5 USC §605. If a reasonable alternative is provided from a member of the public, the agency must give it its full consideration. In its testimony before the House Subcommittee on Rural Enterprises, Business Opportunities, and Special Small Business Problems, the Northwest Mining Association suggested the alternative of allowing temporary roads, on an as needed basis, with either natural or affirmative reclamation. While Advocacy acknowledges that it is not an expert in forest planning, this seems like an alternative in allows harvesting of natural resources while assuring that the forests are not permanently damaged or irreparably harmed. At least the mitigating impacts of this alternative should be carefully analyzed.

Northwest Mining's suggestion is only one of what may be several strong alternatives offered by the public as a less burdensome solution to the problem. Failure to fully address alternatives that may provide a workable solution to the problem may violate the RFA and raise questions as to whether the agency actions were arbitrary and capricious. If challenged, a court may find that FS' treatment of alternatives was insufficient.

In addition, Advocacy believes that FS should require local FS planners to require local FS planners to perform an RFA analysis in drafting future forest plans that implement this rulemaking to assure that the implementation minimizes the economic impact while achieving the goal of preserving the environment. RFA compliance will provide the public with information necessary to participate fully in the rulemaking process and possibly provide suggestions as to ways that may make implementation less costly.

Conclusion

The Office of Advocacy recognizes the importance of protecting the environment, conserving our national forests, and preserving the natural beauty of the area. However, there is also a significant public interest in allowing access to natural resources in order to preserve our economic base. The potential economic impact of this proposal on small businesses and small communities could be devastating. Prior to implementing such a rule, FS should make every attempt to understand fully the economic impact of its actions and to find less burdensome or mitigating alternatives. In the alternative, it should explain fully why these alternatives will not help FS achieve its environmental objectives. As Advocacy has stated on several occasions, the requirements of the RFA are not intended to prevent an agency from fulfilling its statutory mandate. Rather, it is intended to assure that the economic impacts are fairly weighed and considered in the regulatory decision making process.

The public has an interest in knowing the potential economic impact of a particular proposed regulation. As the court stated when remanding a rule to the agency in Northwest Mining v. Babbitt, "While recognizing the public interest in preserving the environment, the Court also recognizes the public interest in preserving the rights of parties which are

affected by government regulation to be adequately informed when their interests are at stake and to participate in the regulatory process as directed by Congress."*Supra.* at 13. Providing the public with a complete economic analysis that fully discloses the potential impact of the action and considers less burdensome alternatives not only complies with the requirements of the RFA, it also complies with the basic tenets of sound public policy that balance conflicting interests.

Thank you for the opportunity to comment on this proposal. If you have any questions, please feel free to contact us. Please place a copy of these comments in the record.

Sincerely,	Sincerely,	Sincerely,
Jere W. Glover Chief Counsel Office of Advocacy	Jennifer A. Smith Assistant Chief Counsel for Economic Regulation & International Trade	Brian Headd Economist

Cc: Charles Rawls

USDA Forest Service *Interagency Cost/Benefit Analysis Meeting*
CEQ, February 25, 2000, 1-3 PM

Attendees: Jim Schaub (USDA/OCE), Tammy Croote (OMB), Amanda Lee (OMB), Jennifer Smith (Advocacy/SBA), Brian Headd (Advocacy/SBA), Bill Lange (FS), Leigh Linden (CEA), Tom Brumm (CEQ), Linda Langner (FS), Scott Conroy (FS), Bill Supulski (FS)

Discussion

- SBA raised a concern that the requirements of the Regulatory Flexibility Act must be met. Wants a clear understanding for the public on what the effects are to small business. There was general discussion on Forest Service SBA rules for timber sales.

- Concern was raised by OMB that the DEIS does not present the economic information in the traditional cost/benefit framework and therefore a separate cost/benefit document should be prepared. The cost/benefits should include a broad discussion of the baseline, a discussion of the proposed rule's requirements, and a discussion of the combined effects of the roads rule, planning rule, and the roadless rule. We discussed the problem associated with including discussions of other proposed rules in the DEIS, and that it would not be appropriate in that document. There was also some concern about an imbalance in our ability to portray effects, mainly that timber effects are quantified, while little quantification exists in other resource areas.

- OMB would prefer a quantitative approach to estimating the effects of national procedures. The FS raised a concern that we have no basis for a quantitative effects analysis for the procedures. FS wants to use trends information and a qualitative discussion to portray the effects, while OMB prefers a sensitivity analysis based on a hypothetical range to disclose the magnitude of the economic effects.

- An estimate for the next 10 to 20 years is considered adequate for economic duration.

- OMB and SBA discussed the need to solicit comments and request data for those areas which the FS did not have data for the DEIS. Such a request could be put in the preamble language, and SBA is going to provide an example. Although this is a common practice in rule-making, the language needs to carefully considered because of the potential for implying the DEIS is not sufficient.

Follow-up Actions

- The FS will produce a stand-alone cost/benefit analysis that will be part of the rule docket.

- The FS will prepare documentation on the effects to small businesses, based on requirements of the Regulatory Flexibility Act as outlined in the implementation guidance found at sba.gov/adbl/laws and regulation section.

- The Forest Service socioeconomics specialist paper will be put on the web in support of the analysis for the DEIS.

DOC. 241
PAGE 1 OF 2
Working Paper

- The FS will provide OMB a copy of USDA publication referred to on page 3-78 of DEIS.
- The general counsel for SBA (Gary Glover) will give an opinion on whether a regional effect analysis must be done as part of the analysis for the Regulatory Flexibility Act.
- OMB/SBA will send FS examples of cost/benefit analyses done by a land management agency (BLM, DOD, FWS, NPS) for a national rule supported by NEPA.
- Parties will raise to their next agency level the issue of the type of effects analysis that should be done for the procedures part of the rule.

DOC. 241
PAGE 2 OF 2

FEBRUARY 29, 2000

TO: SCOTT CONROY
DIRECTOR
ROADLESS PROJECT
USDA FOREST SERVICE

JULIA RIBER
DEPUTY DIRECTOR
ROADLESS PROJECT
USDA FOREST SERVICE

FR: JERE W. GLOVER
CHIEF COUNSEL
OFFICE OF ADVOCACY
SMALL BUSINESS ADMINISTRATION

JENNIFER A. SMITH
ASSISTANT CHIEF COUNSEL
FOR ECONOMIC REGULATION

BRIAN HEADD
ECONOMIST

RE: THE OFFICE OF ADVOCACY'S COMMENTS ON DRAFT PREAMBLE, PROPOSED RULE, AND CHAPTER 3 OF EIS

You requested written comments on the Draft Preamble, Proposed Rule, and Environmental Impact Study (EIS) for the protection of roadless characteristics initiative. Below please find the Office of Advocacy's comments.

Draft Preamble & Proposed Rule

As we stated at the meetings, the Office of Advocacy of the U.S. Small Business Administration (SBA) was established by Congress under Pub. L. No. 94-305 to represent the views of small business before federal agencies and Congress. Advocacy is also required by §612(a) of the Regulatory Flexibility Act (RFA) (5 U.S.C. 601-612) to monitor agency compliance with the RFA. In that we are an independent office within SBA, the comments provided are solely those of the Office of Advocacy and not those of SBA.

The RFA requires agencies to consider the impact that a proposed rulemaking will have on small entities. If the proposal is expected to have a significant impact on a substantial number of small entities, the agency is required to prepare an initial regulatory flexibility analysis describing the reasons the action is being considered; a succinct statement of the objectives of, and legal basis for the proposal; the estimated number and types of small

entities to which the proposed rule will apply; the projected reporting, recordkeeping, and other compliance requirements, including an estimate of the small entities subject to the requirements and the professional skills necessary to comply; all relevant Federal which may duplicate, overlap, or conflict with the proposed rule; and the significant alternatives that accomplish the stated objectives of the of the statues and that minimize any significant economic impact of the proposed rule on small entities. 5 U.S.C § 603.

If the proposed rulemaking is not expected to have a significant economic impact on a substantial number of small entities, 5 USC §605 of the RFA allows an agency to certify a rule, in lieu of preparing an IRFA or FRFA. If the head of the agency makes such a certification, the agency shall publish such a certification in the Federal Register at the time of the publication of the general notice of proposed rulemaking for the rule along with a statement providing the factual basis for the certification. See, 5 U.S.C. §605(b).

The RFA material for the proposal consists of one paragraph in the Regulatory Impact section of the Preamble. It states:

> "Moreover, this proposed rule has been considered in light of the Regulatory Flexibility Act (5 USC 601, et seq.). This proposed rule primarily proposes an agency prohibition on road building in inventoried roadless areas and proposed procedures to guide the planning and management of other roadless areas. As proposed action, this proposal has no direct or indirect financial or other impact on small businesses. Therefore, it is hereby certified that this proposed action will not have a significant economic impact on a substantial number of small entities as defined by the Act."[1]

The statement provided in the preamble is wholly inadequate for RFA purposes. There is no factual basis. It is simply a statement of the proposal and a statement that there are no financial impacts on small business. In essence, the agency has provided a conclusion without stating the premises for that conclusion. There is no indication of the types of entities that may be impacted or the nature of that impact. The public has the right to know the expected economic impact that this proposal may have on the planning and management of forests.

The failure to provide an appropriate RFA analysis is bothersome given the fact that it appears that FS has access to the economic information necessary to perform the baseline analysis that is required by the RFA. Although the information provided in Chapter 3 of the EIS is vague, it has some economic data that provides some insight to the potential impact of this proposal and indicates that FS has access to the information necessary for complying with the RFA.

For example, Table T6 on the Maximum Average Annual Economic Impact from National Prohibitions on Road Construction and Timber Harvest in Inventoried Roadless Areas states that the total impact on income will be $109,066,000. If FS has information

[1] Draft of Special Areas: Protection of Roadless Characteristics, page 19

on income, it should be able to determine the portion of the income that was generated by small entities and impact that the proposal will have on the income of small entities.

Similarly, the EIS indicates that the activities require permits or some other approval mechanism. FS, therefore, should have some indication of the number of small businesses that participate in their programs and have permits for activities on their lands. This information can be used to determine the overall impact on small entities and to provide the public with information about the entities that FS expects to be affected. By identifying the affected industries, FS is not only notifying the industries that may be affected, it is also providing a means for ascertaining whether a potentially impacted industry has been excluded.

Information in EIS Indicates That There May Be A Significant Economic Impact

Moreover, the information found in the economic effects section of the EIS, while limited, contradicts the agency's statement that this rule will not have an economic impact on small entities. For example, paragraph 3 of page 3-103 states that about two-thirds of the Tongass National Forest's planned timber offer over the next five years would be from inventoried roadless areas, which are likely to have higher costs per unit of harvest volume than roaded areas. An increase in cost would affect the net revenue of a firm and, therefore, is an economic impact on small entities.

An increase in costs for the timber harvest is an indication of only one of the many areas that may have an impact on small entities. Logic dictates that cost may increase in other industries as well. For example, it is our understanding that if a business has a permit to perform a certain activity, such as mining, in a roadless area that business will still be able conduct that activity. However, that business may incur the additional costs of finding alternate means for removing the resources.

Although FS has maintained in meetings that the agency cannot predict whether a particular activity, such as a timber sale will occur or whether a small business will bid on a particular sale, the agency does know that 73% of the annual average planned offer would be reduced by the road prohibition. If the agency knows that there will be a 73% reduction in planned offerings, it should be able to provide the public with some indication of where the reductions will occur and the potential economic impact of that reduction in quantifiable terms. Moreover, if the agency maintains that the 73% reduction will not be a significant impact, the information from the analysis would provide it with the factual basis to support the conclusion. The lack of an analysis, in view of a known 73% reduction, makes the conclusion highly suspect.

Moreover, FS should provide the public with insight into the types of timber that may be affected. Since the value of board is influenced by the type of timber, information about the type of timber that will be affected is significant for determining economic impact.

The agency should also analyze the impact of no timber sale or a reduced timber sale occurs in a particular area due to this proposal for RFA purposes. These are simple

calculations that FS should be able to provide to the public for review and comment. Even if FS does not have all of the information that it needs to perform the calculations, there are analytical methods for addressing uncertainty and variability, which are acceptable, provided that the analysis is made available for public scrutiny. Advocacy is also concerned about the conclusion of no significant impact in the mining industry, given the fact that EIS states that NFS lands account for a large share of US mine production for certain minerals, and the only reasonable source of construction sand and gravel for some areas. The EIS also states that the effects of the proposal will be lower revenues and higher costs. EIS, p. 3-112. An increase in costs and a decrease in revenue contradicts the statement that there are no financial impacts and, once again, makes FS' certification of no significant economic impact ludicrous.

Moreover, the EIS indicates that the proposal may have an impact on the small recreational industries such as outfitting, fishing, hunting, snowmobiling, etc. While hiking or helicoptering to the desired location may be an alternative, such alternatives increase costs and limit earnings for the small business engaged in the activity. Moreover, in some instances, access may be impracticable (e.g. hiking to a canoe site carrying a canoe) and ultimately cause a business to shut down. These are the types of issues that FS needs to consider in making its RFA determination.

Impact on Small Governmental Jurisdictions

Please note that the RFA requires an agency to consider the impact on small entities. Small businesses, small governmental jurisdictions, and small organizations are considered small entities. 5 USC § 601(6). A small governmental jurisdiction is a governmental district with a population of less than 50,000. 5 USC § 601(5). In this proposal, the agency may also need to consider the impact on small governmental jurisdictions.

The EIS states that the harvest of timber generates jobs and income for local economies. See, page 3-103. States and local communities also receive payments for timber harvests. If FS is able to provide information by region on the anticipated impact, FS should be able to identify which small governmental jurisdictions in those regions will be affected and the level of economic impact. This information is necessary for the public to be able to ascertain the actual impact that this proposal will have on a particular community. Moreover, agency consideration of the actual impact on individual communities may provide some insight into whether the action will cause financial devastation for a particular region.

FS Should Consider Regional Impacts in the RFA Analysis

Although the EIS states that this is a national rule, 96.4% of the inventoried roadless area acres are found in 12 states. EIS, page 3-2 . These states are grouped into 10 regions. Those 10 regions will experience 98% of the impact of the proposal. A 98% impact on 12 states grouped into 10 regions indicates that the rule is more regional in scope than national. To base a conclusion of whether the proposal will have a significant economic

impact on a substantial number of small entities on the impact of the proposal on the national economy, rather than the regional or State economy, produces skewed results that are inappropriate for RFA purposes.

Section 603(a) of the RFA states that "...analysis shall describe the impact of the proposed rule on small entities." In Southern Offshore Fisheries v. Daley, No. 97-1134-CIV-T-23C (M.D. Fl. Oct. 17, 1998) on remand, the United States District Court for the Middle District of Florida criticized National Marine Fisheries Service (NMFS) for relying on a pool of 2,000 plus individuals who held shark fishery permits to constitute the universe of fisherman potentially affected by the quotas, even though three-fourths of the permittees were not even expected to land one shark. It stated that relying on the 2,000 plus permit holders as the operative universe enabled NMFS to disperse arithmetically the statistical impact of the quotas on shark fishermen. Slip Op. at 5. Likewise, to base the determination of significant economic impact on a substantial number of small entities on the overall impact of the national economy or national industry, rather than the impact on the regional economy or industry participants, disperses the statistical impact, produces illusory results, interferes with the public's right to know the true impact of the proposal, and deprives the agency of the opportunity to make a fully informed rulemaking procedure.

Recommendation

The material provided indicates that this proposal may have a significant economic impact on a substantial number of small entities. The certification in the proposal, therefore, is inappropriate and could be challenged easily. Advocacy strongly recommends FS to perform a forthright IRFA that complies with the requirements of the RFA. The RFA only requires the agency to consider the economic impacts on small entities and less burdensome alternatives. Performing a proper IRFA, therefore, will not prevent the promulgation of a rule that has considered the economic impacts and viable alternatives. Not performing a proper RFA analysis, however, may lead to judicial review and remand of the rule. See, Northwest Mining v. Babbitt, 5 F. Supp. 2d 9 (D.D.C. 1998).

Comments on the Draft Rule

Although it was explained at the meeting that the rule does not apply to small entities that may already hold permits, leases, or contracts involving resources in the specified areas, this exemption is not clear in the language found in §294.14 of the rule. Moreover, it is Advocacy's understanding from the meetings that rule does not apply to mining activities covered by the 1872 Mining Act. It is our understanding that in such instances, FS would provide some sort of temporary road or alternate means of access for mining to occur. Neither the rule nor the preamble explains that exemption clearly. Clarification of §294.14 and the information in the preamble is necessary to minimize confusion and unnecessary litigation.

Comments on Chapter 3 of the Draft EIS

As stated previously, Advocacy is concerned about the lack of information on the economic impacts that this proposal will have on small entities. While the EIS contains information on acreage, jobs, revenue, etc., it is unclear with regards to the actual impact that this action will have on businesses and communities.

Since permits and other mechanisms of approval are necessary to participate in activities on Federal lands, FS should have information on the types of businesses that rely on NFS resources. Also, since FS has some indication about the level of activity by small businesses in the past and the economics of that activity, FS should be able to provide some indication of the economic impact on small businesses in the future. Furthermore, FS should be able to provide some indication of the amount, impact, and types of displacement that may occur for small entities that seek alternate means of meeting their resource needs.

Recreation

The information provided on the economic impacts to the recreation industry is vague. Although information is provided on the number of recreational permits and amount of receipts, there is no clear indication of the number of small business permittees, average receipts for small businesses, or potential additional costs associated with the proposal.

Timber

Advocacy incorporates the comments that it made above regarding the timber information provided in the EIS. In addition, Advocacy is concerned about the lack of information regarding the type of timber that will be made available to the particular locations. FS admits that there will be a reduction in the timber offering, will there also be a change in the types of timber offered? A change in the types of timber offered could also have an impact on revenues if the new offers consist of an inferior resource.

There is also no real discussion on the costs of obtaining timber from an alternate source. The costs of removing timber without roads, obtaining timber from private sources, or travelling to other locations in the NFS system for timber could be quite costly for a small business. Advocacy is unable to ascertain from the EIS whether these costs have been considered.

Minerals and Geology

Advocacy incorporates the comments that it made above regarding mining. In addition, Advocacy contends that the "Minerals and Geology" section is too vague to evaluate fully. Advocacy is particularly concerned about mining because the first paragraph on page 3-67 of the Review Draft EIS states that "output from NFS lands accounts for a large share of U.S. mine production" for certain commodities and "the only sources of sand and gravel or crushed stone within a reasonable shipping distance may be on NFS

lands." Although FS acknowledges that one of the effects of the proposal will be less income, higher costs, and a decrease in mineral exploration, there is no discussion on the magnitude of the expected reduction in income, the increase in costs, or the expected decrease in exploration. See, page 3-112. The lack of information raises questions about the validity of FS' conclusion that the impacts in the near future are minor.

Conclusion

Cutting off access or significantly reducing access by existing viable business entities raises economic impact questions that FS has not addressed in its certification that is belied by its own information. The agency's responsibility for preparing an IRFA cannot be escaped. An IRFA that demonstrates a significant economic impact does not condemn a rule-if, and this is important, that the rule can be justified in the context of an overall public policy objective, despite the impacts. The law merely requires agencies to analyze the impact objectively and justify the rule against the backdrop of those impacts and a fair evaluation of alternatives. What FS has developed thus far in justification of its rule is grossly deficient.

U.S. SMALL BUSINESS ADMINISTRATION
WASHINGTON, D.C. 20416

OFFICE OF CHIEF COUNSEL FOR ADVOCACY

APRIL 3, 2000

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RE: THE OFFICE OF ADVOCACY'S COMMENTS ON THE ROADLESS AREA CONSERVATION PROJECT

As noted above, this memorandum is in reference to the Office of Advocacy's comments on the documents for the Roadless Area Conservation Project. At the interagency meeting on March 21, 2000, the final calendar for the project was distributed. According to the calendar, the final Forest Service/Office of the General Counsel review was supposed to begin on March 29, 2000. At the meeting, Forest Service stated that the Office of Advocacy's comments would be due at some point during the week of March 27th, rather than on the March 24, 2000 deadline date that was given to the other agencies. The extension in time to submit comments was due to the fact that Forest Service had not completed the economic analysis that is required by the Regulatory

Flexibility Act (RFA). To date, Advocacy has not received the RFA portion of the rulemaking.

As stated in our previous comments, the Office of Advocacy's primary role in the project is to represent the interests of small businesses and assure compliance with the RFA. To that end, Advocacy has submitted comments in the past and met with members of Forest Services' team to suggest a course of action for Forest Service to obtain RFA compliance.

As we stated in our comments on February 29th, the RFA requires agencies to consider the impact that a proposed rulemaking will have on small entities. If the proposal is expected to have a significant impact on a substantial number of small entities, the agency is required to prepare an initial regulatory flexibility analysis describing the reasons the action is being considered; a succinct statement of the objectives of, and legal basis for the proposal; the estimated number and types of small entities to which the proposed rule will apply; the projected reporting, recordkeeping, and other compliance requirements, including an estimate of the small entities subject to the requirements and the professional skills necessary to comply; all relevant Federal which may duplicate, overlap, or conflict with the proposed rule; and the significant alternatives that accomplish the stated objectives of the of the statues and that minimize any significant economic impact of the proposed rule on small entities. 5 U.S.C § 603. If the proposed rulemaking is not expected to have a significant economic impact on a substantial number of small entities, 5 USC §605 of the RFA allows an agency to certify a rule, in lieu of preparing an IRFA or FRFA. If the head of the agency makes such a certification, the agency shall publish such a certification in the Federal Register at the time of the publication of the general notice of proposed rulemaking for the rule along with a statement providing the factual basis for the certification. See, 5 U.S.C. §605(b).

We have been in constant contact with Forest Services about the fact that Advocacy has not received the documents that it needs to complete its review of the materials. Accordingly, we recognize and appreciate the fact that the delay in receiving the RFA materials is due to Forest Services' desire to produce an adequate analysis. However, Advocacy is concerned that the final review process may begin even though we have not received the materials that we need to complete our review and provide meaningful comments on the proposal. It is our hope that regardless of the schedule, Advocacy will be given an ample opportunity to review the materials and that Advocacy's comments will be given serious consideration.

In addition to not having the materials necessary to complete its review, Advocacy is also concerned about the Interagency Team list that is found in Chapter 4. Readers may misinterpret the list as indicating that the proposed rule is an interagency work product that was produced with consensus of all members and incorporation of all comments. Advocacy contends that some sort of disclaimer language should be included in order to avoid misconceptions and confusion.

U.S. SMALL BUSINESS ADMINISTRATION
WASHINGTON, D.C. 20416

OFFICE OF CHIEF COUNSEL FOR ADVOCACY

April 19, 2000

To: Betty Anderson
Forest Services

Linda Lagner
Forest Services

Fr: Jennifer A. Smith
Assistant Chief Counsel
for Economic Regulation
(202) 205-6943

Brian Headd
Economist
(202) 205-6953

Re: Draft Initial Regulatory Flexibility Analysis for the Roadless Project

You asked us to review the draft Initial Regulatory Flexibility Analysis (IRFA) for the protection of roadless characteristics initiative. Below please find our comments and suggestions on the draft IRFA.

Background Section

In the background section of the IRFA, you provide background information on the RFA and state that Forest Services (FS) does not believe that an IRFA is required but is preparing an IRFA given the significant public interest in the rulemaking. The basis for the contention that an IRFA is not required is that the rule does not directly regulate any entities; it only regulates Forest Service's own employees.

The contention that the rule does not directly regulate entities is confusing. As stated in the background section, the proposed Roadless Area Conservation rule prohibits road construction and reconstruction in the unroaded portions of inventoried roadless areas and would require FS to consider roadless characteristics at the time of forest plan revision. Although you assert that the rule only impacts small entities by foreclosing future business opportunities, that statement is illogical with respect to industries such as construction and timber. The statement of need states that the action is needed because road construction, reconstruction, and timber harvest activities in inventoried roadless and other unroaded areas directly threaten the fundamental characteristics of these areas.... If the initiative is needed to prevent those particular activities, it is illogical to say that those industries will not be directly impacted. But for this initiative, there would be road construction and timber harvesting in those areas. Since this regulation

effectively eliminates the road construction and timber harvesting to protect certain areas, the impact is direct and radically alters small entity economic expectation interest.

Even if we were to consider for the sake of argument that the impact is indirect on timber and road construction, the impact on small business in those industries is foreseeable and measurable. The consequences of the rule may also have a predictable and foreseeable indirect impact on small neighboring communities and small businesses in several industries including, mining, recreation, grazing, timber products. Because these impacts are predictable and foreseeable, good public policy mandates a thorough economic analysis of the proposal and its alternatives.

Certification May Be Inappropriate

We are pleased that FS has elected to perform an IRFA in view of the significant public policy concerns. This has been confirmed by Alan Basala, Ph.D., our regulatory impact economist. He reviewed the proposal and recommended that the U.S. Forest Service:

- Present a reasoned bounding of the number of small entities affected by this rule making and the significance of the potential impacts
- Not certify that the rule will not have a significant impact on a substantial number of small entities
- Ask for information allowing a more complete assessment of cost and a more reasoned bounding of economic impact"

We concur with his recommendations.

Evaluation of the IRFA for the Proposed Action

Preliminarily, we understand that FS' ability to perform a thorough economic analysis is hampered by 1) a lack of precise information about the various industries and communities affected by this rule; and 2) the alleged uncertainty about the way that FS' officials will implement the proposal. To collect more precise information, we strongly suggest that FS use the IRFA to solicit the additional information that is needed to complete a thorough economic analysis.

As for the latter, FS needs to determine the amount of discretion that the proposal provides to forest planners. If there is no discretion, and prohibited activities are in fact prohibited, then the economic impact should reflect the fact that the particular activities will not occur, even though they may have been a part of previously planned activity. If forest planners have some discretion in determining whether a planned activity will be allowed, than FS may want to perform an analysis that reflects the economic impact if the activity were to occur versus strict implementation.

The lack of clarity in describing the amount of discretion that forest planners will have under the proposal has caused confusion about the impact of the proposal. By determining the level of discretion, FS may be able to limit the amount of uncertainty in its IRFA and enhance public understanding of the impact of the proposal.

Requirements of an IRFA

As we stated in our on February 29th comments on the draft proposed rule (Attachment #1), our April 3rd memorandum (Attachment #2), and at meetings on the roadless project, the RFA requires agencies to consider the economic impact that a proposed rulemaking will have on small entities. If the proposal is expected to have a significant impact on a substantial number of small entities, the agency is required to prepare an initial regulatory flexibility analysis describing the reasons the action is being considered; a succinct statement of the objectives of, and legal basis for the proposal; the estimated number and types of small entities to which the proposed rule will apply; the projected reporting, recordkeeping, and other compliance requirements, including an estimate of the small entities subject to the requirements and the professional skills necessary to comply; all relevant Federal which may duplicate, overlap, or conflict with the proposed rule; and the significant alternatives that accomplish the stated objectives of the of the statues and that minimize any significant economic impact of the proposed rule on small entities. 5 U.S.C § 603. In complying with the provisions of section 603 of this title, an agency may provide either a quantifiable or numerical description of the effects of a proposed rule or alternatives to the proposed rule, or more general descriptive statements if quantification is not practicable or reliable. 5 U.S.C. § 607. Although the analysis provided is an improvement, it does not comply with the requirements of the RFA.

Description of the Number of Small Business Affected by the Rulemaking

The RFA requires agencies to provide a description of the number of small entities affected by the regulation. In Tables 1, 8, and 10, FS provides the sectors most likely to be affected by the changes in the timber harvest, mining, and special uses on NFS lands. In the tables, FS provides the industries, SIC codes, SBA standard for small business, and industry type. Under industry type, FS simply characterizes the industry as large or small (e.g. metal mining, large), there is no other information provided about the industry.

Simply stating that an industry is large or small is not a description. It is a conclusion that needs to be justified. If FS has enough information to state that an industry is large or small, FS must have had some means of determining whether the businesses in the industry are within SBA's size standard. Does a classification of large/small mean that all of the businesses in that industry are large/small? What percentage would classify an industry as large rather than small? How was the determination of industry size made? What factors were considered? How many of the businesses are large vs. small? Where was the information obtained? While FS may not have uniform information on the number of permits or contracts issued to small businesses to perform activities on NFS lands, is the information available for certain regions? If so, the information could be utilized to provide a more accurate indication of the number of businesses that may be effected by the proposal. These are just a few of the questions that need to be answered in order to provide the public with a valid description of the industry.

Economic Effects of the Proposed Rule on Small Entities

The Economic Information is Incomplete

As we stated earlier, we recognize that, in some parts, FS' economic analysis needs data that can be solicited during the comment period. However, there are places in the analysis that need information that FS should be able to obtain. For example, Table 4 on pages 9-10 provides the largest potential timber harvest effects from the proposal. The chart provides the National Forest Administrative Unit, the reduction in the average percent of total harvest volume from inventoried roadless areas, and the reduced harvest in inventoried roadless areas as a percent of total harvest volume. Although the reduction amount and percentages are provided, there is no indication of the amount of harvest prior to the reduction or the value of that harvest. If the value of the projected harvest is unknown, FS may want to consider using the value of the last known harvest to estimate the possible reduction in value.

Moreover, in the timber harvesting section, FS fails to consider the type of wood that is in the areas that will not be harvested. Some woods are more valuable than others are. Since the type of wood determines the overall value of the commodity, an analysis that does not provide some insight into the type of wood that will no longer be available for harvesting does not account for the true impact of the prohibition on the small businesses that rely on the timber.

The analysis also appears to be incomplete in the section that discusses the effects on communities. In that section, Table 7 provides a list, by region, of the small communities that may be affected by the proposal. However, there is no indication of the gravity of the impact. Table 6 provides information on the receipts to states as a result of the timber harvests. Would the regions or states have information on the way that the funds were distributed among the communities? Would the regions have economic information on other activities or potential associated costs such as the costs of haul distances? Has FS considered specific questions to solicit economic impact information from the communities?

These are only a few of examples of questions that need to be raised and which require more economic information. There are other areas in sections of the analysis that have similar problems. We are willing to meet with you to discuss these areas further.

The Economic Analysis Makes Assertions without Providing a Basis

In the analysis, FS' makes economic assertions without providing a factual basis. For example, on pages 19, FS states that, nationally, the contribution of NFS lands to sand and gravel is very small. What does "very small" mean quantitatively? Also, on page 19, FS states that although the prohibition on road construction and reconstruction would potentially increase exploration costs, little impact is expected on development of locatable minerals. Why is FS asserting that little impact will occur? Does FS have any indication of the amount of increase in exploration costs? If not, would FS benefit from

soliciting information from the public about the potential increase in cost? Is it infeasible to determine the impact or to provide a basis for the determination of little impact? If so, why?

Again, these are just a few examples of unsupported assertions found in the analysis. We are also willing to meet with you to discuss the unsupported areas further.

Consideration of Alternatives

Pursuant to Section 603 (c) of the RFA, "each initial regulatory flexibility analysis shall also contain a description of any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities. ..." Although FS states the alternatives that it considered as part of the rulemaking, it does not provide any insight to the actual mechanics of the alternatives or the economic impact of the alternatives. The failure to provide such information hampers the public's ability to provide meaningful comments on the rule and its alternatives. If challenged, a court may find that FS' treatment of alternatives was insufficient. See, Southern Offshore Fishing Association v. Daley, 995 F. Supp. 1411 (M.D. Fl. 1998);. Southern Offshore Fishing Association v. Daley, on remand, slip op. at 5.

Conclusion

The draft IRFA has does not satisfy the requirements of the RFA. The lack of an accurate description of the affected industries, complete economic data, unsupported assertions, and consideration of alternatives needs to be addressed before the IRFA is published for public comment. If the information is not available, FS should request additional information from the public in its notice of proposed rulemaking to assist FS in making a determination of the economic impact of the proposal.

We recognize that FS is under tight time constraints and is in the process of obtaining OMB clearance of the proposal. However, FS should consider publishing a statement stating that it will publish for public comment an economic analysis on the impact of the proposal on small entities within the next 15 days. If the IRFA were published 15 days after the proposal, the public would still have 45 days to review it and provide meaningful comments.

Please understand that we are not trying to interfere with the proposal. We understand that there is a significant public interest in conserving our national forests. We are not asking that FS provide any special treatment to small entities. We are simply requesting that FS consider fully the economic impacts of the proposal on small interests in order to assure that other public interests are not compromised significantly in the process of conserving our national forests.

Thank you for the opportunity to comment on this proposal. If you have any questions, please feel free to contact either of us.

21 June 2000

To: Scott Conroy

From: Linda Langner

Re: Regulatory Flexibility Act Analysis for the Final Roadless Area Conservation Rule

An Initial Regulatory Flexibility Act Analysis (IRFA) was completed to accompany the proposed Rule on Roadless Area Conservation. Because of a lack of data, the Forest Service could not determine whether the proposed rule would have a significant effect on a substantial number of small entities. Therefore, the agency included a list of questions in the IRFA that requests small entities to provide data on expected impacts from the proposed rule.

The decision on whether a Final Regulatory Flexibility Analysis is needed to accompany the final rule cannot be made until the public comment is compiled. Public input from small businesses and small governmental jurisdictions is essential to provide the data needed to determine the possible impacts of the rule. If small entities provide no substantive comment, then the agency can certify in the final rule that no significant impact is expected.

If substantive comment on the effects on small entities is received during the public comment period, then the agency needs to determine whether the information indicates the rule would have a significant impact. There are no strict guidelines for making such a determination. Agencies that regulate businesses often make determinations based on variables such as percent of firms impacted, cost increases, etc. These types of variables cannot be estimated for the roadless area conservation rule. Therefore, the agency will have to judge the significance of the impact based on the number of comments and the level of impact described in those comments.

Because of the importance of the public comments, a process has been initiated to ensure that I review all letters from small entities that could relate to assessing these impacts. At this point, the CAET has agreed to do a weekly search of their data base of all letters that have been coded to include references to small business or small governmental jurisdictions. I have discussed the list of codes with the team leader in Salt Lake City, and am confident that their coding structure is exhaustive enough to capture any letters that could in any way provide information for the regulatory flexibility analysis. I will receive copies of all letters that are identified in the data base search.

I will review these letters to determine if the comments provide data for a better assessment of small business impacts. As information comes in, Betty Anderson and I will keep the interagency team members from the Office of Advocacy apprised of our findings. In the event that substantive comments are provided, we will work with the Office of Advocacy on how to make a determination of "significance."

If a significant determination is made, a Final Regulatory Flexibility Analysis (FRFA) will be completed and provided as part of the clearance package for the final rule. The FRFA will include the data from the public comment, and must also include proposed mitigation for small entities. I believe it would be useful to consult with State and Private Forestry if a determination of significant impact is made. Although it is difficult for me to conceptualize mitigation strategies for small businesses that would be consistent with the roadless rule, I believe we have a number of cooperative programs that could indirectly be used as the basis for mitigation.

If a finding of "no significant impact" is made, the agency will document the rationale for the finding, provide the rationale to the Office of Advocacy, and include the rationale in the clearance package as part of the preamble to the final rule.

Assuming that the CAET is able to complete an initial assessment of public comment two weeks after the public comment closes, then the determination of significance can be made by mid-August, at the latest. If the volume of related comments is considered sufficient to consider the effects significant earlier in the comment period, then the determination can be made earlier. But the analysis cannot be completed until all of the relevant comments have been received.

U.S. SMALL BUSINESS ADMINISTRATION
WASHINGTON, DC 20416

OFFICE OF THE CHIEF COUNSEL FOR ADVOCACY

AUG 31 2000

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RE: PROPOSED CHANGES TO THE ROADLESS RULE

At the last Interagency team meeting, Forest Services announced that it was planning to change the definition of "roadless" in the roadless initiative to include all roaded and unroaded inventoried areas, as opposed to only the unroaded portions of the inventoried roadless areas as proposed. It is also our understanding that FS is considering additional changes to the content of the proposal. The Office of Advocacy has some questions about the changes to the rule and would greatly appreciate clarification of the following issues and that they be discussed at the next meeting on Tuesday, September 5th.

FEDERAL RECYCLING PROGRAM PRINTED ON RECYCLED PAPER

Change in definition

In the original proposal, the affected area was only the unroaded portion of the inventoried roadless areas. It is our understanding that FS is asserting that this change is not a substantive change that would require additional notice and comment under the requirements of the Administrative Procedures Act (APA).

Questions: If you are adding roaded areas to the definition, are you not expanding the scope of the original rule to include areas that were not considered a portion of the original rule? If so, could you please explain why the public does not have the right to provide input on the anticipated impact of the amended definition?

Exemptions

It is our understanding that FS is considering an exemption for all mining activities in national forests. The Office of Advocacy is pleased that FS is considering such an exemption. It is our understanding from the mining industry that the impact of this particular rule would have been $2 billion to $4 billion annually. By exempting mining from the rule, FS will mitigate the impacts of this particular rulemaking on the mining industry.

However, providing an exemption for mining raises the question of whether FS could develop a more flexible plan or alternative for the timber industry. Mining is a finite resource. Timber is a renewable resource. The public comments indicate that in some regions the timber industry will be placed at a distinct disadvantage as a result of this proposal because the industry members are highly reliant on public lands.

Questions: Is it possible to make concessions for entities that have participated in the Federal programs in the past? Rather than applying the rule to the entire inventoried roadless area outright, would a "rolling" approach work? "Rolling" would entail the rule applying to different parts of the Forest System at different times. The benefit of this approach would be that the timber industry would adapt to the renewability of this resource. As new trees are being planted and grown, roads would be prohibited and access denied in that area. Roads and access would be allowed in other areas where timber could be harvested. The rationale for this plan would be to, as is stated in the Regulatory Flexibility Act, "minimize the impact on small business."

Flexibility

From a public policy standpoint, it seems that additional flexibility could mitigate the economic impacts of the rule, as well as some of the environmental and safety concerns that have arisen with the recent fire situation.

Question: Since FS is considering changes to the proposed rule, is it possible to provide for additional flexibility on the local level of the rulemaking process? Would it

not mitigate some of the concerns of the regional offices, in terms of implementation, if the rule allowed for more discretion on the part of the regions as opposed to acting as a complete prohibition on road construction and reconstruction?

Review of Comments

The Office of Advocacy understands that FS has received an enormous response in terms of comments. Advocacy is concerned that, given the short time frame, the tasks of reviewing all of the comments may be quite daunting and that it may be difficult for FS to adequately reviews these comments. Incorporation of some of the issues and points raised in these comment letters can only serve to strengthen the rule by taking into account how it will function in a "real world" setting.

A number of important facts and issues are raised in these letters by groups and individuals that will be affected by this rule on a daily basis. For example, the Governor's Office for the State of Utah submitted some rather compelling comments on the impact of the rule on the timber industry. The Governor's Office contends that, as a result, there is a misrepresentation of the overall reduction due to the proposed rule. This is a very serious allegation that raises serious questions such as why were the baseline harvest years of 1996-98 used to determine the impact this rule would have on the timber volume. According to the comment on this rule from the Governor's Office in Utah, the harvest level of 1996-98 is far below the average harvest level of the previous decade.

Questions: Is this a problem specific to the harvest in Utah or were the figures for 1996-98 below average throughout the entire National Forest system? Does this drop in volume represent an anomaly or do those figures represent a trend of smaller harvest volumes that has developed over time? What are the reasons for such a decline? Advocacy trusts that FS will address these types of concerns when responding to the comments.

Questions: Finally, under the APA and the RFA, the Forest Service will have to address significant comments submitted during the comment period. Given the volume of comments, will the Forest Service be able to comply with the APA and RFA requirements given the current tight schedule for finalizing this proposal?

Fires

The proposal prohibits road construction and reconstruction of 45 million acres in the inventoried roadless areas. Recent reports indicate that the recent forest fires have destroyed more than 6 million acres.

Question: What impact will the fires have on the implementation of the rule? Will the affected areas be set aside as a portion of the land to be a part of the prohibition? Will the areas be reforested?

Conclusion

The Office of Advocacy recognizes that FS has expended considerable resources on this particular rule. FS has also made significant efforts to provide small entities with information about the rule and to mitigate the impacts of the rule. Advocacy hopes that its comments are not misconstrued as adversarial in nature. On the contrary, Advocacy is trying to assist FS in completing its task in a manner that will withstand judicial and Congressional review. As noted above, the recent changes to the rule raise significant notice and comment issues that may lead to challenges under the APA.

Similarly, pursuant to the Small Business Regulatory Enforcement Fairness Act, (SBREFA), Congress has the authority to review and disapprove any rules, major or otherwise. Major rules can only go into affect 60 days. The term 'major rule' means any rule that the Administrator of the Office of Information and Regulatory Affairs of the Office of Management and Budget finds has resulted in or is likely to result in 1) an annual effect on the economy of $100,000,000 or more; 2) a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions; or 3) significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic and export markets. See, 5 U.S.C. §801 et seq. Advocacy asserts that given the potential impact of this rule on particular industries and regions of the country, Congress could possibly designate this rule as major, even if the overall costs do not exceed $100,000,000. Congressional review is not, however, limited to major rules.

Because of the possible challenges and policy implications, FS should give careful consideration to the impact of the rule and take the necessary steps to mitigate the impacts of this rule in order to build a defensible record that balances the public interest with economic impacts or makes a case for an overriding policy. Advocacy believes that by addressing the aforementioned questions, FS may be able to anticipate and address some of the challenges before they actually materialize. The Office of Advocacy looks forward to discussing these issues in detail at the next meeting.

U.S. SMALL BUSINESS ADMINISTRATION
WASHINGTON, DC 20416

OFFICE OF THE CHIEF COUNSEL FOR ADVOCACY

September 19, 2000

To: National Forest Service Roadless Team

Fr: Jennifer Smith
Brian Headd

Re: Draft Final Regulatory Flexibility Analysis on the Roadless Initiative

On September 5, 2000, the Forest Service's (FS) provided the Office of Advocacy with a Draft Final Regulatory Flexibility Analysis (FRFA) for the Rule on Roadless Area Conservation for Advocacy's review. Advocacy appreciates the effort made by FS to provide an advance copy of the FRFA for Advocacy's review. Please note that Advocacy recognizes that the FRFA provided is a work in progress and that, because of FS time constraints, there may have been significant changes to the FRFA since the completion of the September 5th draft. Advocacy reviewed the draft FRFA and prepared the following comments on the sections of the FRFA that appear to be completed or near completion to aid in the discussion at today's meeting.

Advocacy's Comments on the Draft Environmental Impact Statement (DEIS)

Preliminarily, on September 9th, the Office of Advocacy submitted comments on by email on the DEIS. The socioeconomic section of the DEIS contains some of the same information that is in the FRFA. Advocacy incorporates those comments by reference. A copy of the comments is attached to this memorandum.

Please note that in the comments on the DEIS, Advocacy expressed concern over FS failure to provide a full analysis of the impact of the rule on school districts. In terms of the FRFA, Advocacy is extremely concerned about the lack of analysis of the rule on small school districts. Section 601(5) states that "the term "small governmental jurisdiction" means governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand..." As stated in Advocacy's comments on the Draft DEIS, some of the comments from communities indicated that this rule will have a significant impact on the school districts. Advocacy asserts that the issue of the impact of the rule on school districts should be analyzed and addressed in the FRFA as well as the DEIS.

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Elements of FRFA

On page 2 of the FRFA, FS provides a summary of the elements found in a FRFA. Although elements 1,2, and 4 are accurate, the summary of sections 3 and 5 miss key elements.

Section 604(3)

Although FS is correct in stating that Section 604(3) of the RFA requires "description of and estimate of the number of small entities affected", Section 604(3) also requires an explanation, if no such estimate is available. There are areas of the FRFA that have vague descriptions of the estimate of the number of small entities affected. Specific examples are at:

Pages 17 –19 FS provides information on the communities that are affected by the reduction in payments to states and states that the school districts will be affected. Can a chart on school districts affected also be added to the FRFA? Also, can the information in Table 6 be broken down in terms of impacts on individual communities as well as impacts on regions?

Pages 30-31 In the discussion of grazing, FS provides information on the number of permittees. However, there is no indication of how many permits are held by small entities.

Pages 31-33 FS discusses the growth of the non-forest timber product industry, which includes edible wild food plants, medicinal plants, floral greenery, products used for fiber and dyes, and chemical plant extracts. Although FS acknowledges that it is a rapidly growing multi-billion dollar industry, there is no indication of the number of businesses affected by the rule. Moreover, FS states that FS generated $2,977,626 in revenue from the sale of permits and leases to collect non-timber products. Does FS have information on number of small entities that obtained permits or leases?

Page 35 FS does not provide a description of the composition of the winter resort industry that operate on FS lands. The closest description is a statement on page 36 that "large corporations manage most downhill ski area on NFS lands". Are any of these permits held by small entities? If so, how many? Moreover, page 35 also notes that FS may allow some expansion within permit boundaries to alleviate economic concerns but notes that it will not address small business issues? Is there a reason why small businesses are not being included in the change?

Page 36 FS states that outfitters and guides are usually small, local business. FS states that there are 5,777 special use permits for outfitters and guides. Were all of the permits issued to small businesses?

Page 37-38 FS provides no information on the number of small road construction contractors that may be affected by the rule. Although FS states that 99% of the

construction companies are small, it does not provide information on the number of companies. FS should be able to find that information through census data compiled for the Office of Advocacy. Moreover, are these contracts issued through a bidding process? If so, does FS have information on the companies that have obtained the contracts? How many companies obtained contracts? Were they large or small? Can the data be analyzed for the individual regions? Also, it should be noted that the statement on page 38 that it is unlikely that the rule will have an impact on small businesses engaged in road building needs to be explained fully. Without a full explanation, the statement is nonsensical in that the purpose of the rule is to prohibit roads in certain areas. Simply stating that there are other areas for roadbuilding is not sufficient without exploring the likelihood of occurrence.

Advocacy assumes that either FS has not completed its analysis or the description is vague because the numbers are not available or are incomplete. If this is the case, FS needs to provide an explanation for the lack of information on the number of entities that are affected.

Section 604(5)

FS summarized the requirements of Section 604(5) as "steps taken to mitigate the impacts on small entities". Advocacy asserts that this description of the requirements is overly simplistic and fails to recognize key elements. Section 604(5) requires:

> "A description of the steps the agency has taken to minimize the significant economic impact on small entities consistent with the stated objectives of applicable statutes, <u>including a statement of the factual, policy, and legal reasons for selecting the alternative adopted in the final rule and why each one of the other significant alternatives to the rule considered by the agency which affect the impact on small entities was rejected.</u>"

Advocacy notes that page 38 states that the alternatives section will be updated and by sector for the FRFA. In reading the alternatives section, Advocacy recognizes that it is incomplete and the lack of completion may explain why the analysis of the alternatives is vague and without sufficient quantitative or qualitative information to determine whether FS has given true consideration to alternative solutions to this initiative. Moreover, the analysis of alternatives does not contain any indication of steps taken to minimize small business impacts. In preparing the alternatives section, please provide a full analysis as required by the full text Section 604(5) of the RFA, including quantitative information where available.[1]

Other comments on alternatives:

[1] Section 607 of the RFA states that in preparing a FRFA an agency may provide quantifiable or numerical description of the effects of a proposed rule or alternatives to the proposed rule, or a more general descriptive statement if quantification is not practicable or reliable.

Page 39-FS states that the effects in the discussion on alternatives are not directly linked to effects on small businesses or on small communities. In order to comply with the requirements of the RFA, FS should provide an analysis of the impact of each alternative on small entities. Will the sector analysis of the alternatives include information on the impact of each alternative on small entities?

Page 40-Table 2-2 of the DEIS is referenced to explain the impact of the projected timber harvest. Can that table be added to the FRFA to aid the reader?

FS states that small businesses engaged in timber, mineral production, and a variety of special uses would likely be less affected under the no action alternative than the proposed rule. Is this true also for the final rule? Can the effects be quantified? Are there tables in the DEIS that could provided insight into the impact?

Likewise is there information on the outfitters, guides, and hunting and fishing businesses to support FS' statement that they would be negatively impacted by the "no action" alternative? Can FS address the comment submitted by some members of the recreation industry that roads are needed to obtain access to certain areas?

Those are some of the issues that Advocacy hopes to discuss this afternoon. If you have any questions about this memorandum or any other issue, please feel free to contact us. Thank you.

Julia Riber
09/19/00 07:36 AM

To: Sue Cummings/WO/USDAFS@FSNOTES
cc:
Subject: SBA Comments on Draft FEIS

----- Forwarded by Julia Riber/WO/USDAFS on 09/19/2000 07:35 AM -----

Douglas Schleusner
09/15/2000 03:32 PM

To: Linda Langner/WO/USDAFS@FSNOTES, Susan Chamley/WO/USDAFS@FSNOTES, Curtis Spalding/R4/USDAFS@FSNOTES
cc: Bill Supulski/WO/USDAFS@FSNOTES, Scott Conroy/WO/USDAFS@FSNOTES, Julia Riber/WO/USDAFS@FSNOTES
Subject: SBA Comments on Draft FEIS

Main question raised by Jennifer has to do with discussion (both Volume 1 and 3) on economic impacts to school districts.

Douglas P. Schleusner, Assistant EIS Team Leader, Managing Editor
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----- Forwarded by Douglas Schleusner/WO/USDAFS on 09/15/2000 03:28 PM -----

jennifer.smith@sba.gov
09/15/2000 02:16 PM

To: dschleus/wo@fs.fed.us
cc:
Subject: Comments on Draft FEIS

<<roadless comments on draft feis.doc>>

Doug,

Per our conversation earlier today, attached please find comments on the Draft FEIS. If you have any questions, please feel free to give me a call. Thanks.

Jennifer A. Smith
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Economic Regulation &
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Office of Advocacy
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DOC. 4125
PAGE 1 OF 3

To: Douglas Schleusner
Managing Editor
Roadless Initiative EIS
United States Forest Services

Fr: Jennifer Smith
Assistant Chief Counsel for
Economic Regulation and International Trade
Office of Advocacy

Re: Comments on the Draft Final Environmental Impact Statement

You asked the members of the Interagency Team to review the Draft Final Environmental Impact Statement (FEIS) and provide comments in four specific areas. The questions and answers are provided below.

1) Do the alternatives and the analysis of effects, as modified by the draft FEIS reflect public and agency concerns as you understand them?

   Although the alternatives and analysis of effects reflect agency concerns, they may not accurately reflect public concerns. Public officials submitted comments that indicated that this rule would have an impact on school districts that are dependent upon the portion of the Treasury receipts that are returned to States. Although FS acknowledges that the receipts are used for schools and roads on page 3-282 of the EIS, FS does not provide a full discussion on the actual impact that this rule will have on the individual school districts, many of which may be small.

   Education is extremely important. Would a section explaining the impact of the Roadless Initiative on education and schools would assist the public in understanding the full impact of this rule. If so, you may want to consider adding a section on page 3-282 immediately following the statement about the receipts being used for schools. Another possible alternative may be to devote a section to school districts under socio-economic impacts. An individual section would allow for a discussion that includes cumulative impacts of the loss of receipts, job loss, decline of tax base, etc. on the school districts.

   Owl Payments

   You state that actual payments to states in Regions 5 and 6 agree $100 million dollars higher from 1996-1998 due to owl guarantee payments. (Page 3-267). Can you calculate what the payments will be without the owl guarantee payments? Also, for the sake of clarity, is it possible to add a few sentences on page 3-267 explaining the owl guarantee payments, when they expire, and why a similar program is not feasible for the Roadless Initiative?

2) Are there factual errors or conclusions that are unsupportable based on the information provided? There were no detactable factual errors or conclusions that are unsupportable based on the information provided.

3) Given the subject matter, is the text understandable, relatively easy to read, and appropriate in tone? Some areas could be cross-referenced to make the material clearer. For example, on page 3-265 FS discusses the affected environment for the timber harvest. The economic effects of the timber harvest are also discussed on page 3-297 through 3-301. The latter pages include a chart on the ability for the particular timber dependent community to adopt to change. Considering the size of the document, would it increase the readability of the document if the sections referred the reader to the other areas that address the particular topic?

4) Are the responses to public comment accurate, appropriate in both tone and level of detail, and consistent with content of the draft FEIS?

   Advocacy is still reviewing the voluminous comments for the Roadless Initiative. Advocacy will provide a more thorough answer on Tuesday, when it meets with FS to discuss the Final Regulatory Flexibility Analysis. However, in reviewing Volume 3-Agency Responses to Public Comments, it appears that FS may have "lumped" the concern about impact of the decrease in the payments to states on school districts into comment 305 –Reductions in payments to states will further degrade local economies. In the reply, FS does not address the issue of school districts at all. Aside from the fact that some school districts may qualify as small entities under the Regulatory Flexibility Act, the issue of the impact on our nations schools needs to be addressed from a public policy standpoint.

Editorial Suggestions

Page 3-250: The word "since" is missing a "c" in the second sentence of the third paragraph.

Page 3-280. The second sentence of the first paragraph is a sentence fragment because of a typographical error. There is a period instead of a comma at the end of clause.

If you have any questions, please feel free to contact me at (202) 205-6943. Thank you for the opportunity to comment on this important matter.

U.S. SMALL BUSINESS ADMINISTRATION
WASHINGTON, DC 20416

OFFICE OF THE CHIEF COUNSEL FOR ADVOCACY

OCTOBER 11, 2000

TO: MIKE DOMBECK
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USDA FOREST SERVICE

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RE: DECISION NOT TO EXEMPT LEASEABLE MINIERALS FROM THE ROADLESS INITIATIVE

The Office of Advocacy is concerned that there may not be an exemption for leaseable minerals and energy products in the Forest Service's (FS) Roadless Area Conservation initiative. It is Advocacy's understanding that, without an exemption, future mining activities and the expansion and/or extension of mining leases will be prohibited in the

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inventoried roadless areas. The impact of these decisions will not only have a negative impact on small entities, but on the national economy as well.

Leaseable Minerals

The Office of Advocacy has repeatedly concerns about the impact of this proposal on the mining industry. Initially, Advocacy was told that the impact on mining would not be significant because most of mining would be exempt under the 1872 Mining Act. FS, however, agreed to solicit information from the mining community about the impacts of the proposed rule. Subsequently, the mining industry provided information that indicated that the proposal disallows mining on 43 million acres of federal land. It asserted that more than $7 trillion dollars of coal and metal resources would be placed off limits by the proposed rule.[1]

FS acknowledges the impact of the rule on leasable minerals in the Final Environmental Impact statement (FEIS). For example, Table 3-72 addresses that issue of coal. According to Table 3-72, in the Powder River Basin area alone, there is a coalfield valued at 6,532 billion dollars. In the powder River Basin, 87% of the coalfield containing inventoried roadless areas is federally owned coal. The gross value of that coalfield was $5,682 billion in 1998. If average out over 30 years, the value is $189.43 billion per year. Note that $189.43 billion only represents one area of coal resources and, therefore, represents only a portion of the annual cost of this rule.

Not having access to resources valued at a minimum of $189.43 billion per year, a resource that is needed for US economy. Coal is an important energy resource that is necessary for basic needs such as electricity and heating. If an exemption is not created, what is the alternative for small entities using coal based energy.

Other Resources

Coal, however, is not the only important natural resource that will be prohibited by this rule. Phosphate is another mineral that would not be mined under the rule. According to Table 3-52, there are 873.3 million tons of phosphate that are in inventoried roadless areas. These resources will not be utilized because of this rule.

Oil and natural gas are also leaseable resources that will be prohibited by the rule. FS' information indicates that the mean estimate of undiscovered technically recoverable crude oil on federal lands is 20.8 billion barrels. The oil has a gross value of 226.1 billion dollars. Likewise, there are 171.34 trillion cubic feet of natural gas on federal lands. The estimated value of the gas is $332.4 billion dollars. If access to the government owned resources is denied, the country will have to obtain access through some other means. Importing is noted as an alternative source. Under current economic conditions, oil prices would be further exacerbated.

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[1] Comments, Laura Skauer, Northwest Mining Association

Have all alternatives been thoroughly considered? For example, has FS considered alternatives such as limiting the amount of minerals that can be extracted in a given time period as opposed to an all out prohibition? Has FS considered allowing for expansion of current sites or the extension of current leases as an alternative to complete prohibition? Would this allow for the continuation of mining activities while achieving the goal of preserving current inventoried roadless areas? The questions posed throughout this memorandum raise issues that need to be given serious consideration before the decision not to provide an exemption for leaseable minerals is finalized.

Mining Dependent Communities

The rule will not only be harmful to the mining industry, it will also be harmful to some mining dependent communities. By FS' own statistics, 67 communities have greater than 15% of their earnings from mining. Several of those counties derive over 30% of their earnings from mining. Some derive as much as 60-87% of their earnings from mining activities. While Advocacy recognizes that some of those communities are dependent upon locatable minerals that are exempt from the rule pursuant to the 1872 Mining act, several of the communities are not. For example, 33 of the mining dependent communities are dependent upon coal mining. If these communities, many of which may qualify as small entities, are not allowed to continue to mine for coal, they will suffer a significant economic hardship as a result of this rule. Has FS considered how the impacts on these communities can be mitigated to avoid destroying small communities that have grown up in reliance of the resources?

Conclusion

Without an exemption for leaseable minerals and energy resources, the roadless conservation initiative could cause significant harm to entities relying on the mining industry, mining community and the US economy. Advocacy recognizes the importance of roadless conservation to assure that natural resources are available in the future but questions the economic wisdom of the ban. Is it prudent for the US to place to itself in a position where it will have to "reinvent the wheel" in the event that its needs ready access to these valuable resources in the future? More importantly, is it prudent to economically industries and communities today without having some plan for their use in the future should that need arise? Advocacy submits that it is not.

Thank you for the opportunity to comment on this issue. If you have any questions, please feel free to contact me.

October 27, 2000

To: Linda Lagner
Economist
Roadless Area Conservation Team
Forest Service

Fr: Jennifer Smith
Assistant Chief Counsel for Economic Regulation
Office of Advocacy

Re: Draft Final Regulatory Flexibility Analysis for Roadless Initiative

You requested comments on the draft final regulatory flexibility analysis for the roadless initiative. Below please find the Office of Advocacy's comments.

Page 2

The list of requirements for a FRFA is incomplete. Section 604(a)(5) states that an agency must include a statement of the factual, policy, and legal reasons for selecting the alternative adopted in the final rule and why each one of the other significant alternatives to the rule was rejected. This requirement is not included in the list provided by Forest Service (FS).

Page 5, paragraph 3

In the summary, you state that the effects will be more pronounced in two regions. Where will the effects of the rule be most pronounced? How much more pronounced?

Page 6, paragraph 3

FS states that the roadless rule will have an impact on mining through a reduction of payments to states associated with receipts from mining leasing. How much of a reduction? If FS does not have the information to ascertain the amount of the reduction, FS should provide an explanation.

Page 10-12, Section on Changes between proposed and Final Rule

FS states that the rule would place more restrictions on timber harvest in inventoried roadless areas by allowing stewardship [purpose harvest that does not require road construction or reconstruction. It also states that the prohibitions will also be applied to the Tongass. FS admits that changes will result in supply constraints that are greater than

those described in the proposed rule. For the Tongass, FS states that almost 60% of the harvest will be affected after the prohibitions are implemented in 2004.

Advocacy asserts that the changes to timber harvest may violate the notice requirements of the APA. Allowing harvest only for stewardship purposes and disallowing the Tongass exemption are not logical outgrowths of the rule. They are significant changes that should be presented to the public for notice and comment.

Page 13

FS states that it does not have an estimate of the number of small businesses that operate on national forests and grasslands for timber harvest operations. However, no explanation is provided for the lack of information. FS should explain why it does not have the necessary data. Also, if the public provided data in response to FS' solicitation for information, FS should explain why that data is not being used.

Page 14

FS references information provided in the comments from the Utah Forest products Association and a Wyoming timber study. The information indicated a greater impact than FS' estimates. Were these comments given full consideration? Why did FS decide to dismiss the commenters' data?

Page 15

Table 5 presents information on the potential effects of the timber harvest in terms of reduction of sales volume and board feet. Can an additional column be added to indicate the dollar value of the reduction in harvest?

Page 16

FS discusses potential substitution effects in the different regions. FS states that little substitute volume exists in Regions 2, 3, and 10. It further states that information on timber supplies is incomplete. Can FS provide an explanation for not having the information? Is it possible to determine the amount of the substitution available by subtracting NFS land from all forest land in a particular state? Can FS reconcile the admission of the unlikelihood of substitution with earlier statements that product substitution would occur?

Page 17, paragraph 5

FS states that the reductions in timber harvests will be greater than described in the proposed rule. How much greater?

Page 19, paragraph 2

FS refers to increased haul distances. What costs are associated with the increased haul distances?

Page 27, paragraph 2

FS states that new metal mines on NFS lands will begin producing within the next 5 years. Where are the new mines located? Are they in areas that will offset some of the impact of the other aspects of the roadless initiative?

Page 29
FS states that the final rule and FEIS address the public comments on mining. Considering the size of the final rule and FEIS, FS should provide a summary of the information in the FRFA and a citation for where this information can be located.

Page 30, paragraph 1

FS states that roads will be allowed for exploration and development under the Mining Law of 1872, but than states that the prohibition would extend to prevent expansion into lease areas in adjacent inventoried roadless areas. This appears to be contradictory if FS is referring to leases for locatable minerals.

Page 33, paragraph 3

FS states that it cannot predict the number of firms that would have sought permission to explore for mining opportunities? Why not? Was the information provided through the public comments?

Page 34, paragraph 1

FS states that a disproportionate number of mining dependent counties are within or close to national forests. What percentage of these counties will be affected by the roadless initiative? What is the extent of the impact for those counties?

Pages 47-48

The Consideration of Alternatives section does not provide a statement of the factual, policy, and legal reasons for selecting the alternative adopted in the final rule, as required by the RFA. Also, the only sector that is discussed in the comparison section is the timber industry. Other industries, such as mining, and small communities are not analyzed at all in the comparison of alternatives section.

If the information is provided in the FEIS, FS should summarize the information in the FRFA and provide the appropriate citations so that the public can locate the information. Can FS publish the chart that it has on alternatives in the FEIS in the FRFA?

Pages 48-49

FS states that it considered many mitigation measures, including those submitted by the public. However, FS only provides information about the Tongass, temporary roads, and local decision making for leaseable minerals. What other mitigating measures were considered? Why were they rejected? What measures did the public suggest? Were they considered? Why were they rejected?

Finally, FS states that it has chosen to pursue funds to assist communities undergoing the transition. What efforts are being made? Is funding a realistic possibility?

Thank you the opportunity to review the draft FRFA. If you have any questions, please feel free to contact me at 202-205-6943.

November 14, 2000

To: Linda Langner
Economist
Roadless Area Conservation Team
Forest Service

Fr: Jennifer Smith
Assistant Chief Counsel for Economic Regulation
Office of Advocacy
Small Business Administration

Re: Final Regulatory Flexibility Analysis for the Roadless Initiative Clearance Copy

Thank you for forwarding the clearance copy of the Final Regulatory Flexibility Analysis (FRFA) for the Roadless Initiative. After reviewing the document, Advocacy notes that several of the issues that it raised in its October 27, 2000 are not fully addressed in the clearance copy. Accordingly, our previous comments are incorporated by reference.

Significant Changes Have Been Made That Require Notice and Comment

As stated in Advocacy's previous comments, Advocacy asserts that FS has made significant changes to the final rule that require notice and comment pursuant to the Administrative Procedures Act. The decision to disallow timber harvests, except for stewardship purposes and to apply the prohibitions to the Tongass will have a significant economic impact on a substantial number of small entities. The public should be notified of the changes and the potential economic impacts so that meaningful comments can be provided prior to finalization of the rule. Failure to provide such opportunity violates the APA and the RFA.

The Requirements of the FRFA Listed in the Analysis Are Incomplete

In the past, Advocacy has pointed out Forest Service's (FS) failure to provide the proper requirements for a FRFA. As noted in our past comments, the requirements provided by FS are incomplete. Section 604(a)(5) states that an agency must include a statement of the factual, policy, and legal reasons for selecting the alternative adopted in the final rule and why each one of the other significant alternatives to the rule was rejected. Although FS has included the requirement that a FRFA must contain a "statement of the factual, policy, and legal reasons for selecting the alternative adopted", FS failed to include the provision which requires the agency to explain why other "significant alternatives to the rule were rejected".

FS Has Failed to Explain Fully the Absence of Pertinent Information

FS has failed to explain fully why it does not know how many small businesses operate

on FS land. For example, on page 14, FS states that it does not collect information on the size of businesses that operate on federal land. Although it has a list of qualifying small businesses, FS states that not all of the small businesses on the list operate on FS lands. Advocacy asserts that FS must know the names of the businesses that have permits to operate on FS lands. By cross referencing the names of businesses with permits to operate on FS lands with the list of names of businesses that qualify as small businesses, FS should be able to ascertain which businesses operating on FS land are small. If this assumption is inaccurate, FS should provide an explanation as to why simply cross-referencing the lists would not provide the needed information.

Similarly, FS provides information about the amount of royalties that the U.S. Treasury received for activities on FS lands. Usually, royalties are a percentage of the actual estimated value of the extracted resource. If FS has the amount of royalties paid in a given year and the formula, Advocacy asserts that FS should be able to determine the value of the minerals to industry since that value determines the amount of royalty paid.

Moreover, FS solicited information from the public on the nature of the industry and the impact of the rule on small entities. FS should provide information of the results of that request along with information about why information provided by the public was not used for the analysis. For example, on page 14, FS states that the assumptions provided by the Utah Forest Products Association that 78% (11 of 14) of the small family owned sawmills in Utah will cease to operate as a result of the harvest was based on assumptions that were different from FS estimates. Why did FS decide not to use the information provided by Utah Forest Products Association, other trade associations, and the public in the FRFA? Did FS believe that the information provided was inaccurate? If so, why?

FS' Discussion of Alternatives Does Not Meet the Requirements of a FRFA

As noted above, Section 604(a)(5) of the RFA states that an agency must include a statement of the factual, policy, and legal reasons for selecting the alternative adopted in the final rule and why each one of the other significant alternatives to the rule was rejected. FS has not met this requirement. FS has not provided the legal, factual and policy reasons for selecting the chosen alternative. Although FS states that the alternatives are discussed more fully in chapter 2 of the FEIS, FS should provide some indication as to where the different aspects of the alternative section of the FRFA are found in chapter 2 of the FEIS.

Moreover, FEIS only compares the impact of the alternatives on the timber industry. It does not provide insight on the impact on other industries such as mining. It merely states that "Effects on the other sectors, such as mining and special uses, would be fairly similar across all prohibition alternatives, since the additional limitations on timber harvest are likely to have minimal additional effects on other uses of the national forests." This statement is confusing and does not explain the potential impact that the different roadless alternatives would have on other sectors.

Mitigation Measures for Small Entities

In the FRFA, FS states that it considered many mitigation measures to lessen the impact on small entities. Although FS states that it has chosen to pursue funds to assist communities undergoing transition, it does not indicate that it will pursue funds to assist small businesses undergoing the transition. Has FS considered obtaining funds to relocate businesses families to areas where the operating on FS lands is not prohibited? Will it consider funds to assist businesses that will incur additional costs because of the rule? Has it considered a buy-out option for businesses that will be affected by this action?

Finally, is it realistic for the public to believe that funds may be available in the future to mitigate the economic harm that the businesses and communities may experience? If not, is it fair to list it as a possible mitigating factor?

Thank you for the opportunity to provide comments on the clearance version of the FRFA. If you have any questions, please feel free to contact me at (202) 205-6943.

Mr. PETERSON. Mr. Schaefer, throughout the roadless rule-making process the Forest Service has said that mining is not prohibited; only the construction and reconstruction of roads. Would you please comment on whether this statement is true?

Mr. SCHAEFER. Yes, Mr. Chairman. My testimony centered on the mines in Colorado and Utah, all of which are underground mines. So you have a vision of people underground mining and not having the need to access the surface but the simple fact is you have to. You need access to the surface to drill, to explore that coal seam, make sure of the geology, the quality, and to make sure that it is a piece of coal that is worth going after and spending the amount of money that it takes to get the infrastructure.

Also, we have very stringent ventilation requirements for air flow underground to protect worker health and safety so with that, we also have to go to the surface and drill ventilation shafts and install fans. We also have to have roads up there to access those fans and maintain them, as well.

So the simple fact is you do need access to the surface, even with underground mines.

Mr. PETERSON. And do you think you will have that?

Mr. SCHAEFER. No, it is very clear in the Final Environmental Impact Statement and in the final rule that road construction and reconstruction is prohibited on roadless area surfaces.

Mr. PETERSON. Construction or reconstruction?

Mr. SCHAEFER. Road construction and reconstruction.

Mr. PETERSON. Did the Forest Service play any role in the development of the maps you attached to your written testimony?

Mr. SCHAEFER. No, those maps are ones that we developed ourselves. We had tried to obtain that information from the Department of Agriculture and the Forest Service. We had the same problem as the attorney general from Idaho had early on where we asked for maps to show here the boundaries of the roadless areas were located; we were told that they would be on the website but the website was not available until after the close of the public's scoping period.

Once they finally did post them on the Internet they were on such a scale that they were virtually impossible to use for depicting local impacts, to see if we even had a problem. As an example, in Utah we first saw a map that was given to the Department of Energy by the Forest Service that showed areas, three particular coal tracts that were impacted, but we had already been told by the local Forest Service officials that there was no impact and unfortunately we took that at face value.

So we developed these maps and then provided them to the Department of Agriculture and the Forest Service.

Mr. PETERSON. If my memory is correct, the first estimates were 30 some million acres and then it was 40 million acres and it ended up being 58, so there had to be a lot of changes in the process.

Mr. SCHAEFER. I believe there were a lot of changes in the process. We felt like we were chasing a moving target for much of that. In fact, the maps that you see here, the Colorado and the Utah maps, took us the better part of a year to develop and present to the Forest Service and the Department of Agriculture. The Colorado map we finally finished around the first part of November

2000 and the Utah map was not available until December and that was after the issuance of the Final Environmental Impact Statement and during the process when they were drafting the final rule.

Mr. PETERSON. The Forest Service maintains that Forest Service lands account for about seven percent of the national coal production in '99. Do you think that is an accurate figure?

Mr. SCHAEFER. I think that number is very low, Mr. Chairman, and the reason being most of this land is administered by the—the coal resource itself is managed by the Bureau of Land Management and there is a mixed surface. A lot of areas there is BLM surface, Forest Service surface, private surface, but the mineral itself is managed by the Bureau of Land Management.

As such, the Forest Service I do not believe has a really good accurate way of determining how much coal is actually produced on their land. For example, in Wyoming we operate the Black Thunder Mine on the Thunder Basin National Grasslands, which is National Forest Service surface. In 1999 that single mine itself produced right about 5 percent of the nation's supply.

In talking with two neighboring mines that also operate on the Thunder Basin National Grasslands, an informal survey showed that just those three mines in Wyoming were up around 8 to 10 percent. Then you put in Colorado and Utah; I think it could be up in the order of 15 to 18 percent of the total coal supply comes from Forest Service lands.

Mr. PETERSON. Thank you very much.

Mr. SCHAEFER. Thank you.

Mr. PETERSON. Mr. Eppink, the Forest Service Chief's letter to OMB dated January 2, 2001 pretty much dismissed the concerns of the DOE regarding access to oil and gas beneath the roadless areas of the national forests. How do you account for that?

Mr. EPPINK. I do not know that I can. We presented the study, DOE and myself, in November to the White House and what happened after that, really I was not privy to that process. I really cannot comment on that. I do not know exactly the procedure.

Mr. PETERSON. Mr. Otter? Do you have some questions?

Mr. OTTER. Thank you, Mr. Chairman.

And to the panel, my apologies not having been in attendance here all the time. If I plow some old ground that already been plowed, if I go over some questions that have already been asked and you have responded to, my apologies again but it will be for my information and for some of the questions that I want to ask, the information that I want to get, it is going to be necessary for me to ask these.

I would like to start out, if I might, and it is too bad my colleagues from the other side of the bench here are not here because one of them made a special point of what President Bush and then, of course, the attorney general, Mr. Ashcroft, has done relative to the enforcement of the roadless rule and I just want to remind them and put into the record that during the public comment period then-Vice President Gore and candidate Gore made a statement that the roadless decision was a done deal and that the administration, obviously as far as I was concerned at that point, did not care about the scoping period or what the testimony that was

going to be offered by 1.2 or 1.6 or however many people offered testimony or offered an opinion on the value of the roadless area. As far as I was concerned, the administration, if represented by Mr. Gore's comments, they did not care. It was a done deal in his terms and all the Forest Service had to do and the analysis, as far as I was concerned, all they had to do was come out to the end that was already predetermined.

But I would like to begin my questioning by asking Mr. Morton of the Wilderness Society, one of the things that concerns us is that the 65 percent of the land mass of the State of Idaho, and you heard this number and I am sure you are sick and tired of hearing it as I am of saying it, but when you lock away 65 percent of the land mass of an area, that takes away from an economic base; that takes away more importantly, I think, from a taxing base that supports communities and society and education systems, public schools, fire departments, police departments, the building of necessary roads, whether they be not particularly those in the roadless area.

And I think those of us that have all of a sudden brand new discoveries in our area are concerned about the lost potential energy resources and those things but does the Wilderness Society have any idea in mind on how we could replace the lost money because we no longer cut trees in the five national forests in Idaho, which when we cut the trees, there was a certain percentage of that that went to construct the elementary schools in the communities that it affected? It went to help support local systems of government. And right now, as I have said several times in front of this Committee, I think Idaho is down to around $17.2 million, which comes out to about 80 cents an acre, whereas all the other private owners pay $8.80 per acre in taxes per year. If the Wilderness Society suggests that this land belongs to all the people, then you ought to all pay your taxes, so you ought to be paying $8.80 in taxes a year. And for the Forest Service alone it would be $173 million.

Can you tell me how I am going to support my local units? Or do we just wipe them off the map and maybe come up with another map problem? But do we just wipe, along with the 33 mills that we have already shut down during the Clinton years in Idaho, do we just wipe these communities off the map?

Mr. MORTON. Well, I think last year the county payments bill separated county payments for schools from timber harvesting, so I think that problem is a little bit ameliorated.

In terms of locking away, I do not think that is quite the right terminology. I think there are a lot of multiple uses that can still occur on these lands.

In terms of the lumber mills shutting down, right now you have an oversupply problem. Wall Street analysts are saying you need to shut down because there is too much timber on the market, so I am not sure you can blame the roadless policy for those mills shutting down. It is a corporate decision based on profit maximization.

And in terms of tax revenues, there have been studies that show that wilderness areas, property adjacent or nearby wilderness areas actually have a high property value. So you might think

about more wilderness in terms of increasing property values and increasing revenues for those school kids.

Mr. OTTER. Well, unfortunately, if you have lived through one of these, and obviously you have not or you would not be able to make that kind of statement, sir, because when you see a city die, when you see a little town die and generations, five and six generations of people that have lived and worked in that community, whether it is on a ranch or in a lumber mill or in a mine or whatever, all of a sudden that is gone. Those people have to pack up and they have to go start a whole new life and a whole new generational process.

I would like to move on to Mr. Moyer. Mr. Moyer, the Wilderness Society believes that those that are going to use it ought to pay a little bit more for it, I guess. So how much is Trout Unlimited willing to pay for access to the trout streams in the Clearwater reaches of the Clearwater National Forest?

Mr. MOYER. I think we would be willing to pay.

Mr. OTTER. Would you care to say how much?

Mr. MOYER. I have no idea how much more we would be willing to pay. I would just point out, as I did in my testimony, that our local chapters have worked throughout Idaho on Federal lands to work with the Forest Service, providing manpower and money to help the Forest Service conserve trout and salmon resources.

So not only have our members paid the state fishing license fees but they have put out more and given more back to the resource in terms of those things that they have put forward to do that. So I think we have demonstrated that we are already willing to pay more so than a lot of others are.

Mr. OTTER. Do you have any idea what each member would have to pay in order to come up with $172 million?

Mr. MOYER. I think you are forcing me to try to do math in public, which I vowed not to do.

Mr. OTTER. Must be a graduate of public schools.

Mr. MOYER. You are exactly right about that. But I definitely think we would be willing to step up and do more watershed restoration than we are doing. Part of the problem is that the Forest Service does not have sufficient money to help us do that, to get us going.

Mr. OTTER. Well, I would just like to close, Mr. Chairman, and thank you both for your responses.

I would just like to close, Mr. Chairman, by saying I am a grand slam lifetime member of Ducks Unlimited and I am sure, Mr. Moyer, being with Trout Unlimited, you know what that means. It is not that I am not committed to the natural resources and to habitat but along with all the other problems that we have and especially in the Clearwater National Forest, and this is the most pathetic thing that a lot of people do not understand, especially those east of the Mississippi River, and that is that we have lost the genesis of one of the greatest elk herds in the Pacific Northwest in the Clearwater National Forest because the habitat is gone. It has nothing to do with anything except for the fact that the canopy has grown so close together in the forest that the browse is gone.

And it has everything to do with these same organizations like those sitting on the end of that table that come in and say we want

wolves in Idaho and their preferred meal happens to be elk calf. And in that great herd that once sustained a lot of other herds around the United States and around the world, that great herd that once had something like 46 calves per 100 cows is now down to three on a count by the U.S. Fish and Wildlife this year. Three calves per every 100 cows of calf-bearing age.

So it is more than just these esoteric things that everybody likes to talk about. It is real people leaving their real roots and somebody needs to care about that and I wish more than a couple of people at that table did.

Thank you, Mr. Chairman.

Mr. PETERSON. Thank you. I just have to share with my friend from Idaho that I am from Western Pennsylvania.

Mr. OTTER. I said most of the people—

Mr. PETERSON. No, no, no. My district has a county called Elk in it because it has a very successful elk herd in it. In fact, it has been growing to the point that they are going to hunt next year and they have been stalking them in a couple of neighboring counties. They have moved them, not without some controversy, I believe, because when elk get in your farm fields they do a lot of harm. But we have a very successful elk herd in Pennsylvania in Elk County. If you are ever over there I will show it to you.

Mr. Moyer, when your organization's mission to conserve, protect, restore cold water fisheries and their watersheds, how would you suggest that the Forest Service deal with the forest fuels problems in roadless areas to avoid or reduce catastrophic wildfires? I do not know whether you have ever flown over one of these wildfire areas but I have and it is stunningly devastating. I sometimes wonder how it will ever recover. How do we prevent that?

Mr. MOYER. Well, on fire, sometimes that is true but oftentimes that is not true. Moderate to light fires are very much part of natural—

Mr. PETERSON. That is not what I am asking about. Some of the fires of the 7 million acres this year, what percentage of those would you claim were light? I flew over a large area in Idaho and Wyoming a number of years ago and there was not a blade of grass; there was nothing alive. The ground was cooked. They were horrendous fires. The hillsides were sliding into the valleys. The streams had to be totally annihilated. It was devastation, and we flew for a long time. I have never seen anything like it.

And this fuel load will not create a light fire; it will create a fire that absolutely cooks the ground and it will be years before anything will grow there.

Mr. MOYER. My understanding is that the vast amount of the fuel situations that are out there in the Forest Service are in roaded areas and not in the roadless areas. I think the problem that you are talking about is mostly in the roaded areas and especially in the urban forest interface.

The Forest Service did allow for forest health work in roadless areas. Now whether they allowed enough flexibility for that or not, I am probably not the best judge but they did allow for harvest of trees within the roadless areas to take care of fire risk situations.

Mr. PETERSON. I believe some of the most serious fires last year were in roadless areas. Am I correct, Mr. Phillips?

Mr. PHILLIPS. In some parts of the country that is correct.

Mr. PETERSON. Okay, thank you.

Mr. Morton, in your written testimony you assert that roadless areas hold very small quantities of oil and gas. Having heard Mr. Schaefer's testimony and having seen his maps, both of which persuasively demonstrate that there are, in fact, abundant energy resources below Colorado and Wyoming's roadless areas, would you like to amend your statement?

Mr. MORTON. No, because we did an analysis of oil and gas and he was talking about coal. In terms of coal, we have about 1.7 trillion tons of coal in the United States. In the Powder River Basin alone you have almost 140 billion and with annual consumption of 1 billion, you have over 100 years of coal just in the Powder River Basin.

Given some of the advances in solar technology, coal could actually be obsolete. We may never actually mine all the coal that is out there. So I would stick with my statement.

Mr. PETERSON. You said coal will soon be obsolete? Is that what I heard you say?

Mr. MORTON. No, I am saying I have seen economic research from people that said given the advances in solar technology and other renewable energies that the production of coal, the use of coal for energy production could drop dramatically in 20 to 30 years so we may not even actually get to mining all the coal that is there.

Mr. PETERSON. Would you share that research with the Committee? I am on the Interior Subcommittee and we have been holding hearings and boy, I want to tell you the pie charts 10 years out, 20 years out, I wish you were correct. If you have information that wind and solar and renewables are going to be that successful and where and how and the models that are working, I am all for that but I will tell you that is not the information we are receiving from this country's energy experts.

Mr. MORTON. Okay, I will track down a copy of the article.

Mr. PETERSON. For the record.

[Report entitled "Endogenous Substitution Among Energy Resources and Global Warming" submitted for the record follows:]

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Endogenous Substitution among Energy Resources and Global Warming

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The theory of resource extraction has focused primarily on extraction when there is a single, homogeneous demand for the resource. In reality, however, we observe the simultaneous extraction of different resources such as oil, coal, and natural gas and multiple demands such as transportation, residential and commercial heating, and electricity generation. This paper develops a model with multiple resources and grades and multiple demands. The model is simulated with extraction cost, estimated reserves, and energy demand data for the world economy. It is shown that if historical rates of cost reduction in the production of solar energy are maintained, more than 90 percent of the world's coal will never be used. The world will move from oil and natural gas use to solar energy. Global temperatures will rise by only about 1.5–2 degrees centigrade by the middle of the next century and then decline steadily to preindustrial levels, even without carbon taxes. These results are significantly lower than those predicted by the Intergovernmental Panel on Climate Change and suggest that the case for global warming may be seriously overstated.

I. Introduction

Popular predictions of the probable extent of global warming are based on models that do not completely account for price-induced energy conservation, including endogenous substitution between al-

This work was supported by National Science Foundation grant SES 91-22370 and the East-West Center Energy Program. We would like to thank Fereidun Fesharaki, Darrell Krulce, Kang Wu, and seminar participants at the University of California at Berkeley, University of Hawaii, Harvard University, and the East-West Center.

[*Journal of Political Economy*, 1997, vol. 105, no. 6]
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ternative energy sources, cost-saving improvements in extraction technology, and the rapidly declining cost of solar-powered electricity generation. To do so requires a disaggregated model that takes account of possibilities for energy consumers to convert to alternative fuel-using processes and simultaneously solves for efficiency prices of different energy sources and their respective scarcity rents. In what follows, we provide a multiple-resource, multiple-demand framework and develop a simulation model that yields the optimal extraction path for an arbitrary number of exhaustible resources and end uses.

The literature on resource extraction (e.g., Hotelling 1931; Dasgupta and Heal 1974) has focused mostly on developing a theory of resource extraction in which there is a single, homogeneous demand for the resource. A parallel effort has also been made (e.g., Solow and Wan 1976; Kemp and Long 1980) to examine the order of extraction of different grades of an exhaustible resource when there is a single demand function for the resource. Recently, Chakravorty and Krulce (1994) have extended this literature by examining the extraction profile of resources over time when there are multiple resources and multiple demands. In particular, they consider two exhaustible resources—oil and coal—and two demands—electricity and transportation—and obtain the time path of extraction in an infinite horizon planning model.

We modify an approach pioneered by Nordhaus (1973) in which he divided the energy sector into transportation, residential/commercial heating, industrial heating, and electricity sectors. We use this modified framework to simulate the effects of technological change in reductions in the cost of the backstop technology on resource extraction. Nordhaus's work was limited to examining the optimal path of resource extraction and its associated resource prices in the developed world and in the Middle East, an issue that was especially significant during the era of an OPEC-dominated world oil market. We also investigate the consequences for global warming of alternative extraction profiles, including those induced by different levels of technological change and carbon taxation.

Although there is a large and growing volume of literature on global warming (see, e.g., the *Journal of Economic Perspectives* [Fall 1993] Symposium on Global Climate Change), most of the existing studies model alternative scenarios of global warming by using a top-down growth-theoretic framework. These models assume a certain exogenous relationship between growth in gross domestic product (GDP) and the level of greenhouse gas emissions (as in Nordhaus [1991] and Peck and Teisberg [1992]) and determine the efficient level of emissions on the basis of alternative assumptions on the benefits and costs of global warming. In contrast, Manne and Richels (1991) and Manne, Mendelsohn, and Richels (1993) use a model that explicitly accounts for the economywide impacts of rising energy costs. Their model considers alternative sources of energy supply such as hydroelectricity, nuclear energy, and oil, natural gas, and coal. In their models, production of an exhaustible resource is a fixed fraction of remaining reserves and resource prices are fixed exogenously.

The present paper models the consequences for global warming of energy use in a way that is consistent with Hotelling's theory of exhaustible resources. Current data on extraction costs and global reserves of the major exhaustible resources are used to develop marginal extraction cost functions for each resource. Costs of converting each resource into each end use and corresponding efficiency rates are obtained from engineering data. Thus the price and extraction paths of the exhaustible resources are determined endogenously. The focus of the paper is the analysis of fossil fuel extraction and global warming under alternative regimes of technological change and carbon taxes.

The results of the simulation under no technological change are comparable to those of earlier studies. What is new is the set of resource use and global warming projections developed under even conservative estimates of technological change. Under the assumption of current rates of cost reduction in the conversion of solar energy to electricity through photovoltaic technology, our results suggest that carbon emissions will continue to increase for the next three decades followed by a sharp drop as the electricity and transportation sectors shift from coal and oil, respectively, to solar generation. Global temperatures will correspondingly increase by about 1.5 degrees centigrade until 2055 and then decline steadily to zero.[1] A more conservative estimate on technological cost reductions in our model implies a maximum global temperature rise of about 2.3 degrees in 2095 followed by a steady decline as the world shifts from fossil fuels to solar energy. This "conservative" scenario combined with a carbon tax of $100 per ton also generates a warming profile similar to the more optimistic case described above.

The results above suggest several major policy conclusions: (i) Global warming is a short-run problem of significance, at most, over the next hundred years or so; beyond this planning horizon, the problem declines over time under any reasonable scenario of technological change. (ii) The 1–2-degree centigrade temperature

[1] All figures for temperature change in this paper are relative to the historical year 1860.

rise predicted by our model is significantly lower than the 3–6-degree rise by the year 2100 projected by the Intergovernmental Panel on Climate Change (IPCC), an authoritative international panel of scientists (Schmalensee 1993).[2] (iii) The results also suggest that a reduction in damage from global warming can be achieved not only by taxing carbon emissions (which is well known) but by increasing research and development (R & D) in solar energy. A tax of $5 per ton of carbon, which will increase the price of oil by $0.65 per barrel, will generate $10–$15 billion in the United States alone. These revenues could be used to accelerate cost reductions for solar energy technologies.

For the sake of concreteness, this paper focuses on solar energy and, in particular, on reductions in the cost of photovoltaic technologies. A recent survey by Hoagland (1995) in *Scientific American* suggests that a mix of solar-based technologies including photovoltaic, electricity generation from biomass, wind turbines, solar-powered heat engines, and hydropower may predominate and contribute up to 60 percent of the electricity and 40 percent of the world's fuel requirements by the year 2025. These scientific predictions and the results from this paper for a specific solar technology suggest that it is important to explicitly include technological change in the economic analysis of global warming.

The paper is organized as follows. Section II outlines the basic model for multiple exhaustible resources and multiple demands. Section III develops the empirical model and describes the data used. Section IV analyzes the results, and Section V concludes the paper with a discussion on the policy implications and limitations of the model.

II. The Theoretical Model

The model proposed here abstracts from considering uncertainty and asymmetric information. Let there be I resources (e.g., oil, coal, natural gas, and solar energy) available for use in the energy sector, denoted by $i = 1, \ldots, I$, and J energy demand sectors (e.g., electricity, industrial heating, residential/commercial heating, and transportation) denoted by $j = 1, \ldots, J$. For simplicity, we assume that, except for solar energy, all the other I resources are exhaustible. We assume that the sun can, in effect, provide an unlimited amount of

[2] According to detailed cost estimates of Cline (1992) and Nordhaus (1992), a 3-degree warming would cause a cumulative damage of around 1–2 percent of world GDP. Given the considerable uncertainty regarding the global consequences of warming, even these authors admit that the numbers are rather speculative.

solar energy, which can then be converted into each end use by the application of certain technologies detailed below. Thus solar energy is regarded as a backstop technology, denoted by the subscript b when appropriate.

Each of the energy demand sectors faces a downward-sloping demand function given by $D_j(\cdot)$. We assume that demand is positive at all prices and that the area under each individual demand curve is finite. Since the process of conversion from a resource (such as oil) to an end use or demand involves frictional and other heat loss, let v_{ij} be the efficiency of conversion of a unit of resource i into demand j and $q_{ij}(t)$ be the extraction of resource i for use in demand j at any instant of time t. The efficiency factor $v_{ij} \in [0, 1]$ represents the proportion of delivered energy units relative to the total raw energy input contained in one unit of the resource. Generally $v_{ij} < 1$, so some part of the energy content of the resource input is lost in the process of energy conversion. Define $d_{ij}(t)$ as the net or delivered energy of resource i into demand j from $q_{ij}(t)$ units of the resource, so that

$$d_{ij}(t) = v_{ij} \cdot q_{ij}(t). \tag{1}$$

Thus demand in this model is measured in terms of energy services delivered, and not in terms of resources.[3]

The aggregate stock of resource i at time t is given by $Q_i(t)$. This includes proven reserves and estimated but yet undiscovered reserves of the resource. The cost of energy is the sum of extraction and conversion costs. Let c_i be the marginal cost of extraction of resource i. The conversion cost z_{ij} of resource i into end use j is equal to the amortized capital plus operation and maintenance costs of the equipment used in converting the resource into usable energy service for demand j, for example, a gasoline car for conversion of oil into transportation or a solar-powered water heater for conversion of the backstop solar energy into residential heating demand. Aggregation issues relating to these devices are discussed in more detail in Section IV. Thus both the efficiency factor v_{ij} and the conversion cost z_{ij} are resource and demand specific and each forms an $I \times J$ matrix. We assume that the extraction cost of the backstop technology is zero and that it has positive conversion costs to each end use given by z_{bj}, $j = 1, \ldots, J$.

Let the discount rate be r, and define the sum of conversion and extraction costs as $m_{ij} \equiv c_i + z_{ij}$. With a continuous-time model, the

[3] The concept of net or delivered demand was developed by Nordhaus (1977) in order to incorporate losses in energy conversion, e.g., energy lost as heat in the conversion of oil into mechanical energy.

objective is to maximize discounted producer plus consumer surplus over an infinite planning horizon as follows:

$$\max_{d_{ij}(t)} \int_0^\infty e^{-rt}\left[\sum_{j=1}^{J}\int_0^{\sum_{i=1}^{I} d_{ij}(t)} D_j^{-1}(\theta)\,d\theta - \sum_{j=1}^{J}\sum_{i=1}^{I}\frac{w_{ij}}{v_{ij}}d_{ij}(t)\right]dt \quad (2)$$

subject to

$$\dot{Q}_i(t) = -\sum_{j=1}^{J}\frac{d_{ij}(t)}{v_{ij}} \quad (3)$$

and z_{bj} given, $j = 1, \ldots, J$. In (2), we assume that more than one resource may be used to supply any given demand, and the consumer surplus is summed over all demands, net of the costs of extraction and conversion. In both (2) and (3), we substitute $q_{ij}(t)$ using (1). Define $\lambda_i(t)$ to be the costate variable associated with the stock of resource i. Then the current value Hamiltonian for this problem is given by

$$H = \sum_{j=1}^{J}\int_0^{\sum_{i=1}^{I} d_{ij}(t)} D_j^{-1}(\theta)\,d\theta - \sum_{j=1}^{J}\sum_{i=1}^{I}\frac{w_{ij}}{v_{ij}}d_{ij}(t) - \sum_{i=1}^{I}\lambda_i(t)\sum_{j=1}^{J}\frac{d_{ij}(t)}{v_{ij}}. \quad (4)$$

For a proof of the existence of an optimal solution to a related problem, see the appendix of Chakravorty and Krulce (1994). Let the price of end use j be $P_j(t) \equiv D_j^{-1}[\sum_{i=1}^{I} d_{ij}(t)]$. Then the necessary conditions are straightforward and are given as follows:

$$\dot{Q}_i(t) = -\sum_{j=1}^{J}\frac{d_{ij}(t)}{v_{ij}}, \quad i = 1, \ldots, I; \quad j = 1, \ldots, J, \quad (5)$$

$$\dot{\lambda}_i(t) = r\lambda_i(t), \quad i = 1, \ldots, I, \quad (6)$$

$$P_j(t) \leq \frac{w_{ij} + \lambda_i(t)}{v_{ij}}, \quad i = 1, \ldots, I; \quad j = 1, \ldots, J \quad (7)$$

(if $<$, then $d_{ij}(t) = 0$), and the transversality condition

$$P_j(T_j) = \frac{z_{bj}}{v_{bj}}, \quad j = 1, \ldots, J, \quad (8)$$

where T_j are the switch points for transition to the backstop fuel for demand sector j. These conditions are straightforward extensions of Hotelling's rule to the case of multiple resources and multiple

demands. Condition (5) is the usual depletion equation stating that the stock of any resource will be depleted by the quantity extracted aggregated over all demands. Hotelling's rule, which states that the scarcity rent for an exhaustible resource will rise at the rate of interest, is shown to hold for each of the I resources in (6). Since scarcity rents grow exponentially over time, one implication of (6) is that the relative order of scarcity rents for the different resources is completely determined by their values at the initial time period.[4] Equation (7) is the critical relationship that determines which resources are being used for which demand at any given instant of time. It says that if a particular resource is being used for a given demand, the price of the resource must be equal to the efficiency-adjusted sum of the extraction cost, the conversion cost of that resource for that demand, and the scarcity rent of the resource. In other words, the left-hand side of (7) is the marginal benefit and the right-hand side the marginal cost. Finally, (8) gives the usual condition for transition to the backstop technology in which the price in each demand sector j is exactly equated to the backstop price at the endogenously determined time T_j.

It is difficult to draw precise analytical conclusions on patterns of resource extraction in this very general model. In an earlier paper, Chakravorty and Krulce (1994) obtain a solution for the simple case of two resources and two demands under an assumed ordering of extraction plus conversion costs. In the present paper, we use the framework above for the development of an empirical model that addresses issues of global fossil fuel extraction and the generation of greenhouse gases.

III. Demand and Supply Parameters

In this section we provide the functional and parametric specifications for the empirical model. As in Nordhaus (1979), we assume that there are four demand sectors in the global economy: "specific" electricity, industry, residential/commercial, and transportation. Nonelectric industrial demand mainly consists of process and space heating. Residential nonelectric uses include space and other heating. Transportation comprises trucks, buses, autos, trains, ships, and airplanes. Demands in these sectors that are indirectly met by conversion of resources to electricity are grouped into the electricity sector. This classification separating resources directly used in each

[4] In the simulation in Sec. IV, we use multiple grades of oil and coal. Grades of a resource are differentiated only by extraction cost. Condition (6) holds for each grade; i.e., the scarcity rent for each grade increases at the rate of interest.

demand from those used through conversion to electricity was developed by Nordhaus (1979), who defined the latter as "specific electricity." The important energy resources are oil, coal, and natural gas, which currently account for more than 90 percent of the earth's primary energy consumption (International Energy Agency 1995). Other resources such as nuclear, hydro, geothermal, and wind energy have much smaller shares of global energy use and are not explicitly included in this model as energy sources; instead they are netted out of the demand for petrochemical and solar energy sources.

The backstop technology is assumed to be solar energy with zero extraction costs but with nonzero costs of conversion into each demand. Although we have chosen solar energy as the backstop, another promising candidate is nuclear fusion, which is expected to be widely used by the middle of the next century (Furth 1995). In this paper, we use solar energy over nuclear fusion because the latter is still at an experimental stage whereas solar energy is already commercially viable, with annual U.S. sales of about $1 billion (Hoagland 1995). There are various technologies that can be used to convert solar energy into usable forms of energy. They include biomass, wind turbines, solar-powered heat engines, and photovoltaic cells. We consider only photovoltaic technology, in which significant advances have been made in the last 20 years. Its high cost has long been a problem, but the application of modern manufacturing techniques is expected to bring down the cost to less than 10 cents per kilowatt-hour early in the next century (Hoagland 1995). Its commercialization is becoming a reality with Enron Corporation, the largest U.S. supplier of natural gas, and Amoco Corporation, currently building a 100-megawatt plant in Nevada to be commissioned in 1997.

Demand Equations

Sectoral annual demand functions are assumed to take the Cobb-Douglas form

$$D_j = A_j P_j^{\alpha_j} Y^{\beta_j}, \tag{9}$$

where α_j and β_j are, respectively, the price and income elasticities of demand, A_j is the constant coefficient, P_j is the price of delivered energy service j, and Y is the aggregate income or output level, measured by the GDP of the world economy.

For ease in programming, the empirical model is formulated as a discrete-time model. To reduce computational time, we take each time period to be L years, so that the annual growth rate of GDP,

TABLE 1

PRICE AND INCOME ELASTICITIES FOR ENERGY DEMAND SECTORS

Final Demand Sector	Price Elasticity α_i	Income Elasticity β_i
Electricity	−.65	.92
Industry	−.52	.76
Residential/commercial	−.79	1.08
Transportation	−1.28	.81

SOURCE.—Nordhaus (1979).

g_t, is constant within each L-year time period t. This allows us to rewrite (9) as

$$D_{jt} = A_j P_{jt}^{\alpha_j} \left(\frac{Y_0}{1 + g_1}\right)^{\beta_j} \times [(1 + g_t)^{\beta_j} + (1 + g_t)^{2\beta_j} + \ldots + (1 + g_t)^{L\beta_j}] \times [(1 + g_1)(1 + g_2) \ldots (1 + g_{t-1})]^{L\beta_j}, \tag{10}$$

where Y_0 is the GDP of the base year. Aggregation implies that P_j, the price of energy service j, is constant within each L-year time period and can be written as P_{jt}. Let γ_{jt} be defined as

$$\gamma_{jt} = A_j \left(\frac{Y_0}{1 + g_1}\right)^{\beta_j} \times [(1 + g_t)^{\beta_j} + (1 + g_t)^{2\beta_j} + \ldots + (1 + g_t)^{L\beta_j}] \times [(1 + g_1)(1 + g_2) \ldots (1 + g_{t-1})]^{L\beta_j}, \tag{11}$$

which on substitution into (10) gives the inverse demand function

$$P_{jt} = \left(\frac{D_{jt}}{\gamma_{jt}}\right)^{1/\alpha_j}. \tag{12}$$

This inverse demand function can be substituted into the maximization problem (2). The demand parameters remaining to be specified are the price and income elasticities for each sector and the constant A_j. For both the price and income elasticities, we follow Nordhaus (1979), and their values are shown in table 1. The constant A_j is computed from world GDP, energy consumption, and the prices of energy resources for a particular base year, using equation (9). The year 1990 is chosen as the base year, for which Y_0, world

TABLE 2

PRICE AND WORLD GROSS CONSUMPTION OF ENERGY RESOURCES IN 1990

Energy Resource	Price ($/mmBtu)	World Consumption (Billion mmBtu)
Petroleum	3.73	108.04
Coal	2.08	41.67
Natural gas	2.35	42.56
Electricity	...	22.67

SOURCE.—The price figures for oil and natural gas are taken from British Petroleum (1992) and for coal from International Energy Agency (1992a). Data on world consumption of energy resources are obtained from International Energy Agency (1993).

GDP, was $20,209.1 billion, and world consumption of electricity was 22.67 billion mmBtu (million British thermal units).[5] World energy consumption and prices for 1990 are shown in table 2.

Detailed information on global resource use by sector is not readily available. We use shares computed for the OECD group of countries (shown in panel A of table 3) on the world consumption of each resource to obtain sectoral energy consumption in 1990, thereby making an assumption that OECD shares closely approximate world shares. For example, 19.17 percent of the oil consumed by the OECD countries (panel A) is used in industry, and the total world oil consumption is 108.04 billion mmBtu (table 2), which implies that world oil consumption by industry is 20.71 billion mmBtu (panel B). These figures are in turn multiplied by the corresponding efficiency factors (see below) to obtain 1990 consumption in delivered energy units (panel C).

Next we need to compute the price of delivered energy in each end use sector. Since these prices are not directly observable, they are computed from the prices of the fuels given in table 2 using the weights derived from panel B of table 3. These end use prices are shown in table 4. Substituting the values for world prices and consumption for each sector in (9) gives A_i and, hence, the complete system of annual demand equations:

$$\text{electricity:} \quad D_1 = 0.015927 P_1^{-0.55} Y^{0.92};$$

$$\text{industry:} \quad D_2 = 0.091866 P_2^{-0.52} Y^{0.76};$$

$$\text{residential/commercial:} \quad D_3 = 0.006730 P_3^{-0.79} Y^{1.08};$$

[5] World consumption figures for petroleum, coal, and natural gas are net of the resources used for electricity generation; electricity consumption figures include only electricity generated from petroleum, coal, and natural gas and exclude that from nuclear, hydro, and others. The figures are in delivered electricity units rather than raw energy resource units.

TABLE 3

ENERGY BALANCE FOR THE WORLD AND OECD COUNTRIES, 1990

	Residential/ Commercial[a]	Industry	Transportation	Electricity[b]
	A. OECD Countries (mtoe)[c]			
Oil	230.83	265.33	888.02	45.60
	(16.67)	(19.17)	(64.16)	
Coal	23.09	163.71	.10	203.36
	(12.35)	(87.59)	(.06)	
Natural gas	296.69	262.27	.36	47.07
	(53.04)	(46.89)	(.07)	
Total	550.61	691.31	888.48	296.05
	B. World (Billion mmBtu)			
Oil	18.02	20.71	69.31	12.89
Coal	5.15	36.50	.022	46.22
Natural gas	22.58	19.96	.027	16.55
Total	45.75	77.17	69.359	75.66
	C. World Delivered Energy (Billion mmBtu)			
Oil	14.41	14.50	20.79	4.07
	(39.95)	(26.84)	(99.93)	(17.95)
Coal	3.60	25.55	.0056	13.78
	(9.99)	(47.3)	(.03)	(60.79)
Natural gas	18.02	13.97	.0082	4.82
	(50.06)	(25.86)	(.04)	(21.26)
Total (D_g)	36.03	54.02	20.8038	22.67

SOURCE.—Numbers for OECD countries are taken from International Energy Agency (1992c); world figures are taken from International Energy Agency (1992a).

NOTE.—Figures for world delivered energy are computed using information in panels A and B. Numbers in parentheses are row percentages (with electricity excluded) in panel A and column percentages in panel C.

[a] Includes all other residual sectors such as agriculture, public services, etc.

[b] Electricity consumed in the electricity sector is net of electricity generated from other sources such as nuclear, hydro, geothermal, etc.

[c] Figures in the electricity sector of OECD countries are in delivered energy units, not as gross resource input. mtoe stands for millions of metric tons of oil equivalent.

TABLE 4

WEIGHTED DELIVERED ENERGY PRICES FOR ENERGY DEMAND SECTORS IN 1990 ($/Delivered mmBtu)

	Residential/ Commercial	Industry	Transportation	Electricity
Oil	$7.26	$2.14	$74.86	$3.44
Coal	$2.27	$5.71	$0.03	$10.87
Natural gas	$5.12	$1.42	$0.03	$3.18
Weighted price (P_g)	$14.64	$9.27	$74.95	$17.49

NOTE.—The figures above are computed using information in table 3, and efficiency factors and conversion costs.

TABLE 5

EFFICIENCY FACTORS

	Residential/ Commercial	Industry	Transportation	Electricity
Oil	.8	.7	.3	.3157
Coal	.7	.7	.25	.2983
Gas	.8	.7	.3	.2913
Solar	.1275	.1275	.1275	.15

SOURCE.—Efficiency figures are based on Office of Technology Assessment (1992*a*, 1992*b*, 1993), O'Callaghan (1993), and Ahmed (1994).

and

$$\text{transportation:} \quad D_4 = 1.699235\, P_4^{-1.28}\, Y^{0.81}.$$

Conversion Efficiency

A given resource may be converted to a particular end use through technological processes that have varying efficiencies; for example, conversion of oil to transportation is achieved through diesel, gasoline, and kerosene for autos, trucks, motorcycles, different types of airplanes, and so forth. The efficiency differences between them and even within any single category (e.g., gasoline cars with different fuel efficiencies) can be substantial. The same is the case in the residential sector, where space heating, space cooling, water heating, food storage, and lighting together account for 80 percent of sectoral energy consumption but efficiencies within each category (e.g., lighting or stove heating) may vary. Ideally, one would compute the average weighted efficiency of a resource in a given end use by listing the conversion efficiencies for each of the categories and subcategories mentioned above and weighting them by the proportion of the resource consumed in that activity. Except for electricity, use efficiencies for other resources are not well documented. Therefore, we simplify this process by choosing representative activities for each sector for which efficiency data are available. These are light-duty vehicles for transportation (more than half of the energy consumed in the U.S. transportation sector is used for light-duty vehicles [Department of Energy 1993]), stove heating for the residential/commercial sector, industrial process heating for the industrial sector, and electricity generation for "specific" electricity.

Efficiency values (see table 5) were computed using figures for different energy devices given in the Office of Technology Assessment (1992*a*, 1992*b*, 1993), O'Callaghan (1993), and Ahmed (1994). Solar energy efficiencies are based on Ahmed (1994). Typical technologies in electricity generation are conventional steam engines powered by oil, coal, or natural gas. Although the efficiency figures for these devices are available, a better method for electricity was to use an input-output approach based on world data on electricity production by resources and consumption by sector available from the International Energy Agency (1992*b*) and the Office of Technology Assessment (1992*b*). As an illustration of the case of oil-based electricity generation, gross input of oil in energy units is 12.89 billion mmBtu and the output is 4.976 billion mmBtu of electricity. Netting out transmission and other losses yields a net output of 4.069 billion mmBtu, yielding an efficiency figure of 0.3157. Efficiency figures for solar energy in residential/commercial, industry, and transportation sectors are computed in two steps. First, sunlight is converted into electricity by photovoltaic systems with an efficiency of 0.15 (Ahmed 1994). Second, electrical energy is converted to each of the end uses with an efficiency of 0.85 (O'Callaghan 1993), yielding an aggregate efficiency of 0.1275.

Conversion Costs

The conversion cost of a resource into an end use per unit of delivered energy is given by the following relationship:

$$\text{conversion cost}\left(\frac{z_{ij}}{v_{ij}}\right) = \frac{\text{annualized capital cost} + \text{operation and maintenance cost}}{\text{energy consumption} \cdot \text{efficiency factor } (v_{ij})}, \tag{13}$$

where

$$\text{annualized capital cost} = K\frac{s(1+s)^m}{(1+s)^m - 1}, \tag{14}$$

K is the total capital cost of a conversion technology, s is the rate of interest, and m is the lifetime of the capital stock. Annualized capital costs, operation and maintenance costs, and energy consumption are all flow concepts. For simplicity, we ignore other costs such as the cost of transportation and refining.[5]

In the residential/commercial sector, stove heating is chosen as

[5] Transportation costs can be incorporated by adding a constant; e.g., oil industry analysts add a constant $0.50 per barrel to production costs. Including refining costs is more complicated and would require extension of the model to include joint products from refining crude oil such as gasoline, diesel, jet fuel, etc.

TABLE 6

COST OF CONVERTING ENERGY RESOURCES INTO END USES ($/Delivered mmBtu)

	Residential/ Commercial	Industry	Transportation	Electricity
Oil	$13.50	$2.64	$62.48	$7.35
Coal	$19.71	$9.10	$107.74	$10.90
Gas	$7.29	$2.13	$72.32	$6.87
Solar:				
Electricity generation	$86.12	$86.12	$86.12	$73.20
Other costs	$10.43	$1.59	$126.95	$0.00
Total	$96.55	$87.71	$213.07	$73.20

SOURCE.—The conversion costs are calculated from the following sources: residential/commercial sector: Office of Technology Assessment (1992*b*); industry sector: database from the Argonne National Laboratory (Daly and Kosobud 1992); conversion cost of private car: Office of Technology Assessment (1992*b*) (coal conversion includes the cost of a gasoline car [$18.744] plus coal liquefaction [$8.19]; see Grainger and Gibson [1981]); electricity sector: Office of Technology Assessment (1992*b*) and International Energy Agency (1992*b*) for oil, coal, and gas; Ahmed (1994) for electricity generated with solar energy.

the representative technology. However, oil, coal, and solar energy are seldom directly used for stove heating. So we use liquefied petroleum gas (LPG), a crude oil product, as fuel. Since LPG generally has a higher price and is assumed to be a perfect substitute for natural gas, we approximate the cost of converting oil to LPG by the price difference between natural gas and LPG. For coal in residential use, the cost of coal gasification is used to compute the conversion cost. The conversion costs for solar energy in all end use sectors are computed indirectly by first converting solar energy into electricity. That is, conversion costs consist of two parts: the cost of generating electricity from sunlight plus the cost of transforming electricity into a specific end use. The matrix of conversion costs is summarized in table 6. One can observe that industrial process heating is cheaper than other processes, mainly because of the economies of large-scale production and a relatively high efficiency of energy use.

Extraction Costs

Extraction cost functions for energy resources are estimated using original data on proven and estimated reserves in different parts of the world and their cost of extraction compiled by the East-West Center Energy Program. The relevant tables for oil, coal, and natural gas are given in the Appendix (tables A1–A4). First we estimate the continuous extraction cost equations, which are functions of cumulative extraction, using nonlinear regression with alternative functional specifications. Since we expect marginal extraction costs to increase with cumulative extraction, exponential and S specifications were fitted. The cost equations and the R^2 values are as follows:

TABLE 7

EXTRACTION COST ($/mmBtu) AND RESOURCE STOCKS (Billion mmBtu) BY GRADE

Resource	Grade I	Grade II	Grade III
Gas	$0.92		
	(6,683.98)		
Oil	$0.60	$3.47	
	(11,242.67)	(4,916.13)	
Coal	$0.65	$2.37	$5.08
	(225,622.35)	(121,354.2)	(82,068.59)

NOTE.—Numbers in parentheses are resource stocks in energy units (billion mmBtu).

$$\text{oil:}\quad c_{\text{oil}}(t) = 0.1774\,e^{0.000217\,Q_{\text{oil}}(t)}, \quad R^2 = .960; \tag{15}$$

$$\text{coal:}\quad c_{\text{coal}}(t) = 0.2827\,e^{0.00000743\,Q_{\text{coal}}(t)}, \quad R^2 = .997; \tag{16}$$

and

$$\text{gas:}\quad c_{\text{gas}}(t) = e^{0.8908-[3{,}264.7/Q_{\text{gas}}(t)]}, \quad R^2 = .992. \tag{17}$$

To reduce computational complexity and be consistent with the theoretical model, extraction cost functions estimated above are further approximated by step functions.[7] For simplicity, we assume that there is only one grade of natural gas, two grades of oil, and three grades of coal; their costs of extraction are shown in table 7.

Growth of GDP

It is reasonable to expect the demand for energy to increase over time because of the growth in income, especially in the newly developing regions such as Asia, Latin America, and the former Soviet

[7] The method used to obtain step extraction cost functions is illustrated here for natural gas. In this case, there is only one step; i.e., the step function is a constant function that intersects with the continuous extraction cost function (17). This constant extraction cost is bounded by the smallest and largest extraction cost values given by (17). Suppose that the value of the step function is $\bar{c}$. Then the cumulative extraction Q_b for which the step function intersects with (17), can be written as $Q_b = 3{,}264.7/(.8908 - \ln \bar{c})$. When cumulative extraction is less than Q_b, $\bar{c}$ is greater than the extraction cost obtained from (17) and vice versa. Thus the absolute difference (diff) between the step function and (17) is

$$\text{diff} = \int_0^{Q_b} \bar{c} - e^{0.8908-(3{,}264.7/Q)}\,dQ + \int_{Q_b}^{6{,}683.98} e^{0.8908-(3{,}264.7/Q)} - \bar{c}\,dQ.$$

The step function is now determined by choosing the $\bar{c}$ that will minimize diff. A similar method is used for oil and coal, which have two and three steps, respectively. There two and three levels of constant extraction cost are chosen to minimize diff.

Union. For instance, energy demands in the booming economies of the Asia-Pacific region alone are growing at the rate of 5–6 percent per year, although the world average is closer to 2 percent (International Energy Agency 1995). Average global GDP growth rates for the periods 1965–80 and 1980–90 were 4.0 and 3.2 percent, respectively (World Bank 1992). Some other studies on global warming (Organization for Economic Co-operation and Development 1993) have assumed a future GDP growth rate of 3.01 percent for 1990–2000, falling to 1.96 percent during 2050–75. We assume an intermediate figure of world GDP growth in 1990 at 3.0 percent, decreasing at the rate of 10 percent every decade.[8]

IV. Simulation

An algorithm is written in the programming language Pascal that guesses the six scarcity rents (three grades for coal, two for oil, and one for natural gas) in the initial time period. Since solar energy is available in infinite supply, its scarcity rent is zero. Since scarcity rents rise at the rate of interest (by [6]), their paths are completely determined by the initial guesses. This is possible because we use step functions. Resources are allocated to each demand at any instant of time by comparing their prices (see [7]) and choosing the one with the least price. Finally, when we search over the six-dimensional space of initial scarcity rents, suitably bounded by cost and demand functions, and use an annual rate of discount of 2 percent over all periods, the point that maximizes (2) yields the optimal solution. The following scenarios are examined.

The Baseline Model (BASE)

In this scenario the model is run as described in Section III, that is, with all the parameters fixed over time.

Technological Change in Solar Energy Conversion to Electricity

Technological change in the energy sector could affect the base model in several ways. For example, new horizontal oil-drilling techniques have substantially enlarged the stock of resources that can be extracted at any given cost; combined cycle technology in natural

[8] See the discussion on the long-term world GDP growth rate in Nordhaus (1992) and Manne and Richels (1991). The Nordhaus method is more complicated and starts from estimating total factor productivity changes. Manne and Richels appeal to "conventional wisdom," and their numbers on GDP growth rates are slightly more optimistic than ours.

gas engines has now made natural gas use in power generation economically competitive relative to oil. In this paper we focus more specifically on R & D that may affect the backstop technology—a decrease in the cost of solar energy conversion to electricity. Perhaps the most important study on the subject is a comprehensive survey of the future cost of renewable energy technologies (Ahmed 1994). Ahmed reviews cost projections estimated by numerous engineering studies and concludes that the cost of electricity generation using solar energy is expected to go down from 25¢ per kWh ($73.2 per mmBtu) to around 4¢ per kWh in about three decades. Ahmed further expects the cost to continue to decrease and stabilize at approximately 2¢ per kWh. Other studies arrive at similar conclusions. For example, the National Renewable Energy Laboratory (1992) estimates that in the long run, large-scale production of electricity from solar energy will enable the cost to drop from 25¢–50¢ per kWh in 1991 to 5¢–6¢ per kWh in the period 2010–30.

There are two important issues that determine future projected costs of energy technologies. One is the size or the rate of growth of the market, and the other is the extent of R & D support. On the basis of reasonable estimates of the growth of sales of photovoltaic technologies, Cody and Tiedje (1992) project a fall in the cost of photovoltaic electricity from 40¢ per kWh in 1988 to 7¢–12¢ per kWh in 2010. The significance of R & D is emphasized in a Department of Energy (1990) study that is based on two different assumptions for the rate of R & D: a business-as-usual scenario and intensified R & D. Both scenarios (shown in fig. 1) suggest a steady decline in photovoltaic cost, albeit at different rates. The cost of photovoltaics under intensified R & D falls below the cost of electricity generated from fossil fuels around 2026. Finally, in a recent work on the commercialization of solar energy, Dracker and De Laquil (1996) compare pure and hybrid (combination of solar and fossil fuels in electricity generation) solar systems and predict that the cost of electricity will fall to 3.5¢–10.6¢ per kWh by 2005–10.

For the purposes of this paper, we adopt Ahmed's projections and set a lower bound for the conversion cost of solar energy at 2¢ per kWh. However, we vary the time path of cost reduction according to a business-as-usual and an intensified R & D scenario as explained below.

Decreasing Cost of Solar Energy (DCSE50)

This is the intensified R & D case, and it uses the forecasts of solar electricity generation costs by Ahmed, which suggest that the costs of electricity from solar energy would decrease at an approximate

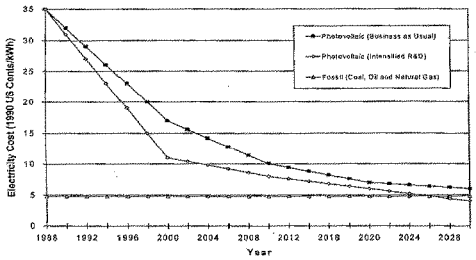

FIG. 1.—Projected cost of electricity. The cost of electricity from photovoltaic technologies is based on two different assumptions: business as usual and intensified R & D. All cost numbers are in 1990 constant prices. The cost of electricity from fossil fuels assumes base-load power. Source: Data on the cost of photovoltaic technologies are taken from Department of Energy (1990); data on fossil fuels are taken from Weinberg and Williams (1990) and the Office of Technology Assessment (1992*b*).

rate of 50 percent per decade. This would imply that the conversion cost would drop to reach 4¢ per kWh in about four decades.

Decreasing Cost of Solar Energy (DCSE30)

Here we adopt a more "pessimistic" business-as-usual scenario and assume only a 30 percent reduction in costs per decade, so that the costs of solar electricity generation would reach 4¢ per kWh in seven decades instead of four as above.

The use of solar energy is a two-part process. First sunlight is used to generate electricity. Then electricity is transformed into energy services in the various end use sectors. This implies that solar energy conversion costs are made up of two parts: the cost of converting solar energy to electricity and then the cost of converting from electricity to end uses. In both experiments, DCSE50 and DCSE30, the 50 and 30 percent reductions in conversion costs involve only the solar energy to electricity cost component. The second component, electricity to end use, has no reason to decrease at the same rates. Therefore, we keep it fixed for the residential/commercial and industry sectors. For the transportation sector (the electric car), there is reason to incorporate some cost reduction over time. Electric car technology is currently under intensive research for improvement, so we set a lower bound at 40 percent of the total conversion cost;

the remaining 60 percent is expected to decrease at the rate of 50 percent per decade. This assumption implies that service delivered from an electric car will cost roughly the same as the service from a gasoline car in about 30 years. This itself is a conservative estimate, given that currently the California Air Resources Board estimates the price difference between a gasoline car and an electric car to be about $3,000–$4,000 (Mestel 1994).[9] The assumption above is realistic because electric cars are becoming a distinct reality, with one in 10 cars in California expected to be zero-emission (electric) by 2003 (2 percent by 1998), and 12 other states in the United States have either approved or are considering legislation requiring introduction of zero-emission vehicles by 1998.

An Across-the-Board Decrease in Conversion Costs (DCC)

Finally, we examine the impact of a decrease in conversion costs. In the absence of any compelling reasons why the conversion cost for a particular resource–end use combination should decrease at a different rate than others, we assume that they all decrease at an equal rate over time. Thus conversion costs for each resource are assumed to decrease to 40 percent of their present levels, at the rate of 50 percent per decade. The cost of solar energy is expected to decline as in DCSE50.

DCC with a Carbon Tax (DCCT100 and DCCT200)

Most carbon tax experiments choose tax rates that are designed to achieve a given carbon emission target at each time period. For instance, the targeted emission may be the 1990 level of CO_2 emissions or annual reductions of 1–2 percent from the 1990 base. Thus proposed tax rates usually vary by geographical region and increase over time. Tax rates varying between $20 per ton of carbon in the initial years to $2,000 per ton in future periods have been proposed (Organization for Economic Co-operation and Development 1993). Since our goal is to demonstrate the impact of carbon taxes in pushing forward the date of arrival of the backstop technology, we examine the effect of a flat tax of $100 per ton and $200 per ton of carbon on the DCC case. A flat tax of $100 per ton of carbon would raise coal prices by about $70 per ton or 300 percent and increase oil

[9] Woodruff, Armstrong, and Carey (1994, p. 106) also reported that "Chrysler estimates that in volumes of 300,000, it could make electric vehicles, minus batteries, as cheaply as gasoline vehicles." The problems of the electric car lie not only in the cost of production but in the reliability of the battery, the battery recharging time, and the drive range per charge. Our assumption that in 30 years the electric car will become a commercially feasible technology is not too optimistic.

TABLE 8

ENERGY RESOURCE USE SEQUENCE AND CARBON EMISSIONS

BASE					DCSE50					CARBON EMISSIONS (Billion Tons)	
Period	Electricity	Transportation	Residential	Industrial	Period	Electricity	Transportation	Residential	Industrial	Year	BASE
1	Coal	Oil	Gas	Oil	1	Coal	Oil	Gas	Oil	1995	7.1691
2	Coal	Oil	Gas	Oil	2	Coal	Oil	Gas	Oil	2005	8.8716
3	Coal	Oil	Gas	**Oil**	3	Coal	Oil	Gas	Oil	2015	10.6948
4	Coal	Oil	Gas	**Coal**	4	**Coal**	**Oil**	Gas	Oil	2025	13.3516
5	Coal	Oil	Gas	Coal	5	**Solar**	**Solar**	Gas	Oil	2035	15.6003
6	Coal	Oil	Gas	Coal	6	Solar	Solar	**Gas**	Oil	2045	17.8627
7	Coal	Oil	**Gas/Coal**	Coal	7	Solar	Solar	**Solar**	**Oil**	2055	21.7682
8	Coal	Oil	Coal	Coal	8	Solar	Solar	Solar	**Solar**	2065	25.2134
9	Coal	Oil	Coal	Coal	9	Solar	Solar	Solar	Solar	2075	27.9959
10	Coal	**Oil/Coal**	Coal	Coal	:	:	:	:	:	2085	32.0235
11	Coal	Coal	Coal	Coal	:	:	:	:	:	2095	35.458
12	Coal	Coal	Coal	Coal	19	Solar	Solar	Solar	Solar	2105	38.2686
:	:	:	:	:	20	Solar	Solar	Solar	Solar	2115	40.8508
:	:	:	:	:						2125	43.1531
28	Coal	Coal	Coal	Coal						2135	45.129
29	**Coal**	Coal	Coal	Coal						2145	46.7335
30	**Solar**	Coal	Coal	Coal						2155	47.9489
31	Solar	**Coal**	Coal	Coal						2165	48.7361
32	Solar	**Solar**	Coal	Coal						2175	49.0859
33	Solar	Solar	Coal	Coal						2185	48.0842
34	Solar	Solar	Coal	Coal						2195	46.6957
35	Solar	Solar	**Coal**	Coal						2205	46.4315
36	Solar	Solar	**Solar**	Coal						2215	45.7866
37	Solar	Solar	Solar	**Solar**						2225	44.7798
:	:	:	:	:						2235	43.4116
:	:	:	:	:						2245	41.7336
53	Solar	Solar	Solar	Solar						2255	39.7551
54	Solar	Solar	Solar	Solar						2265	38.1977
55	Solar	Solar	Solar	Solar						2275	36.4222

NOTE.—Each period represents 10 years: the first period is 1990–99. Carbon emissions are shown only for the corresponding years.

prices by approximately $8 per barrel. It would also raise roughly $200 billion in revenues (Nordhaus 1993). Our purpose in performing these tax experiments is to demonstrate that taxes of this magnitude have a significant effect in reducing fossil fuel use and speeding the arrival of the cleaner backstop fuel.

DCSE30 with a Carbon Tax of $100 per Ton (DCSE30T100)

A carbon tax of $100 per ton is imposed on DCSE30. This experiment will provide an insight into tax policies that could be implemented to control carbon emissions under "pessimistic" assumptions about solar energy cost reduction.

BASE with Carbon Taxes of $100 per Ton and $200 per Ton (BASET100 and BASET200)

Finally, the BASE model is run with uniform carbon taxes to examine the impact of taxation under a worst-case scenario of no technological change.

Simulation Results

The results can be summarized as follows.[10]

1. BASE model results are shown in table 8. Notice that each period is 10 years. With no technological change, it takes 370 years for the world to move completely to solar energy. In the electricity sec-

[10] Since each time period in the model corresponds to 10 calendar years, annual carbon emission figures presented are model emissions divided by 10. This average is plotted in figs. 2, 4, and 6 against the midpoint of the 10-year interval. Carbon emissions in ton per mmBtu of resource input are obtained from Edmonds and Reilly (1985). They are 0.0205 for oil, 0.0251 for coal, and 0.0145 for natural gas. For the climate model used in temperature calculations, the historical base year is 1860, which is about the time of the industrial revolution. Model specifications are taken from Nordhaus's DICE model (see Nordhaus 1992). Let E_t denote global carbon emissions at time t. Then the various relationships are as follows: the accumulation of carbon concentration in the atmosphere, M_t:

$$M_t = 590 + 0.64E_t + 0.0167(M_{t-1} - 590);$$

the radiative forcing equation of CO_2, F_t:

$$F_t = \frac{4.1 \ln(M_t/590)}{\ln(2)};$$

surface temperature in the atmosphere, T_t:

$$T_t = T_{t-1} + 0.2261[F_t - 1.41\,T_{t-1} - 0.44(T_{t-1} - T^*_{t-1})];$$

and the temperature in the deep ocean, T^*_t:

$$T^*_t = T^*_{t-1} + 0.02(T_{t-1} - T^*_{t-1}).$$

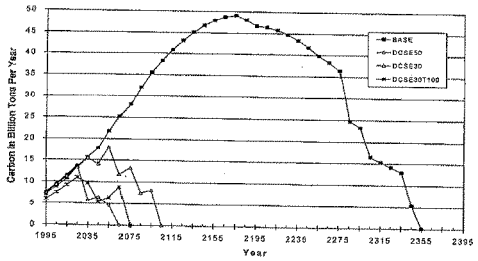

FIG. 2.—Worldwide carbon emissions. The four cases shown are the baseline (BASE), the cost of solar energy decreasing at the rate of 50 percent per decade (DCSE50), at the rate of 30 percent per decade (DCSE30), and at the rate of 30 percent per decade together with a carbon tax of $100 per ton (DCSE30T100).

tor, coal is used exclusively until the transition to the backstop. The transportation sector relies primarily on oil until it is exhausted and then moves to coal. Oil is also used in industry for a relatively short period, followed by coal. Natural gas is exclusively used in residential/commercial heating and is replaced by coal on exhaustion. These results indicate the comparative advantages of oil in transportation, gas in heating, and coal in electricity generation and industry and conform reasonably well with real-world observation. In reality, of course, many other factors such as fuel availability, geographical location of resources, scale of project, security, and trade considerations must be incorporated into the choice of the appropriate energy source. Global carbon emissions around the year 2100 are approximately 37 billion tons, which is within the 22–40 billion tons range of six major global models surveyed by the Organization for Economic Co-operation and Development (1993) and reviewed by Dean and Hoeller (1993). BASE emissions are on the higher side relative to models that assume annual increases in energy efficiency of 0.5–1 percent over time.

2. BASE emissions peak in the year 2175 (49 billion tons) and then decline as each of the fossil fuels gets successively exhausted and is replaced by solar energy (fig. 2). Because of the slow atmospheric absorption of greenhouse gases, global temperatures continue to rise by a maximum of 6 degrees (relative to the historical base year 1860) until the year 2275 (see fig. 3). As long as cumulative emissions are above a certain threshold level, they continue to exert

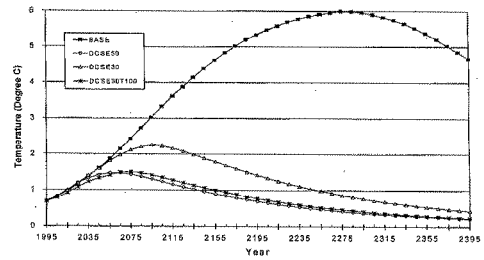

FIG. 3.—Change in global mean temperature. The four cases shown are the baseline (BASE), the cost of solar energy decreasing at the rate of 50 percent per decade (DCSE50), at the rate of 30 percent per decade (DCSE30), and at the rate of 30 percent per decade together with a carbon tax of $100 per ton (DCSE30T100).

a positive effect on ambient temperatures. The model also generates 1995 emissions of 7.2 billion tons, which compares favorably with actual emissions of approximately 7 billion tons (Flavin and Tunali 1996).

3. Under rapid technological change in solar energy (DCSE50), there is an interesting specialization of resources: coal in electricity generation, oil in transportation and industrial use, and natural gas in the residential sector. In contrast to the BASE model, in which abundant coal reserves emerge as a backstop when oil is exhausted, under technological change, there is a direct transition from oil to solar energy in transportation and industry. Carbon emissions peak around 2025 at 13 billion tons, and temperature rises by 1.5 degrees and declines after 2055 (see figs. 2 and 3). In fact, it is comforting to know that under these rates of reductions in solar energy costs, the global mean temperature increases early in the next century but bounces back to the 1995 level in the year 2195.

4. With more "conservative" estimates of technological change (DCSE30), carbon emissions peak in 2055, that is, 20 years later than in DCSE50 (see fig. 2). Solar energy takes over in all sectors by 2105, 40 years late compared to the optimistic case. Temperature peaks in 2095, and it takes 320 years to return to the 1995 level, compared to only 100 years in DCSE50. The maximum level of aggregate emissions is about 18 billion tons reached in the year 2055.

5. However, even under conservative estimates of technological change (DCSE30), figure 2 shows that a uniform carbon tax of $100

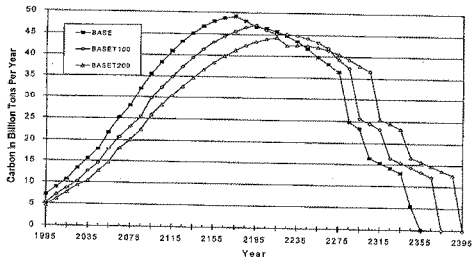

FIG. 4.—Worldwide carbon emissions. The three cases shown are the baseline (BASE), the baseline with a carbon tax of $100 per ton (BASET100), and the baseline with a carbon tax of $200 per ton (BASET200).

per ton (DCSE30T100) will simulate a resource use pattern very similar to the case of rapid technological change (DCSE50). This implies that a moderate level of carbon taxes plus slow improvements in solar technology could be used to simulate the effect of rapid technological change. Or, if there are no future cost reductions in solar technology, these carbon taxes could be used to subsidize the cost of solar energy, and the effect on global warming would be even less than under DCSE50. Of course the growth and distributional implications of such a tax, which implies that coal and oil prices would go up by $70 per ton and $8 per barrel, respectively, may be serious. An equally serious issue is who will collect and control these tax revenues: a carbon tax of $100 per ton in the United States alone is expected to raise nearly $200 billion (Poterba 1993).

6. Figure 4 shows that the effect of a carbon tax on the BASE model is to shift the emission curve down and to the right. That is, a $100 tax shifts the emissions trajectory by about 20 years and reduces maximum emissions by about 2–3 billion tons. This experiment suggests an important conclusion: flat carbon taxes will only postpone global warming and reduce it somewhat (fig. 5). To achieve permanent and major reductions, a more complex tax structure differentiated across end use sectors may need to be created.

7. It is useful to examine the different scenarios with respect to the aggregate use of the fossil fuel stock. Under BASE, all resources are consumed. Under DCSE30, only 8 percent of the world's estimated coal reserves are exhausted. The rest is never used. Under

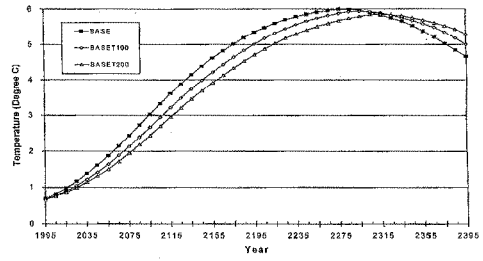

FIG. 5.—Change in global mean temperature. The three cases shown are the baseline (BASE), the baseline with a carbon tax of $100 per ton (BASET100), and the baseline with a carbon tax of $200 per ton (BASET200).

DCSE50, only 1.5 percent of the coal is used. Thus under any reasonable scenario for technological change, most of the earth's coal resources will never be used. Oil and natural gas, however, are both completely exhausted in all three situations.

8. We calculate the loss in world GDP from a rise in temperature using a relationship given by Nordhaus (1992).[11] It suggests that the maximum percentages of world GDP loss within the first 100 years are 0.32 percent, 0.74 percent, and 1.3 percent, respectively, for the three models DCSE50, DCSE30, and BASE. Beyond this 100-year horizon, the annual GDP loss will continue to rise only for the BASE model and will peak at 5.2 percent in the year 2285. Thus, under plausible assumptions on technological change, the losses are much less significant compared to BASE. However, models with a carbon tax will affect GDP levels to a greater extent.

9. The impact of an across-the-board reduction in all conversion costs is very different from the scenario above of a decrease only in solar energy conversion costs to electricity (figs. 6 and 7). Carbon emissions in this scenario will be higher than in BASE over the next 150 years. The maximum level of aggregate emissions reached is also higher: approximately 58 billion tons. A reduction in all conversion costs reduces the price of energy, thereby increasing energy con-

[11] According to Nordhaus, the percentage loss in GDP is $.00144\,T_t^2$, where T_t is the global mean temperature.

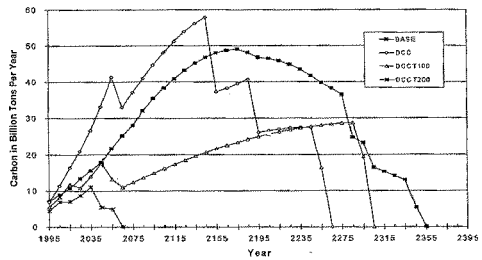

FIG. 6.—Worldwide carbon emissions. The four cases shown are the baseline (BASE), an across-the-board decrease in conversion costs (DCC), an across-the-board decrease in conversion costs together with a carbon tax of $100 per ton (DCCT100), and an across-the-board decrease in conversion costs together with a carbon tax of $200 per ton (DCCT200).

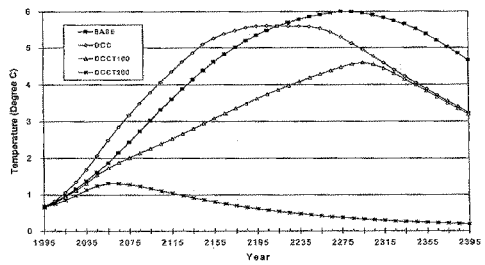

FIG. 7.—Change in global mean temperature. The four cases shown are the baseline (BASE), an across-the-board decrease in conversion costs (DCC), an across-the-board decrease in conversion costs together with a carbon tax of $100 per ton (DCCT100), and an across-the-board decrease in conversion costs together with a carbon tax of $200 per ton (DCCT200).

sumption (and carbon emissions) in the immediate future. Since solar energy costs also decrease as in DCSE50, emissions drop abruptly as fossil fuels are exhausted and each sector moves to solar energy. Carbon taxes of $100 and $200 per ton reduce emissions substantially. In fact, the latter tax will produce emissions comparable to DCSE50. These runs suggest that what seems to be important in affecting emissions is not technological change in the energy sector as a whole, but the magnitude of cost reductions in the backstop technology relative to that of fossil fuels.

V. Policy Implications and Further Research

Unlike most other economic analyses of global warming, this paper adopts a modified Hotelling framework and obtains the time path of exhaustible resource use and carbon emissions under plausible industry-based assumptions on technological change. It shows that moderate rates of technological change will lead to a global temperature increase of about 2.3 degrees, which will decline beyond the next century. However, faster rates of technological change such as those observed in the recent past will increase temperatures only by 1.5 degrees, which will decline after the year 2055.

These results are substantially different from projections made by the authoritative Intergovernmental Panel on Climate Change (1990) and other economic studies in two respects: First, their projections show a monotonically increasing global emissions curve until the year 2100. Our analysis shows a drastic decline in emissions around the middle of the next century under any reasonable estimate of technological development. Second, our predictions of a 1–2 degree centigrade temperature rise conform to the "low" range of most economic studies and are much lower than the IPCC "business-as-usual" scenario of a 3–6-degree rise. Indeed, the IPCC projections are reminiscent of the Club of Rome predictions of the 1970s, by whose account most of the earth's minerals would have been exhausted by today. If current rates of R & D and interfuel substitution possibilities are recognized, a 1–2-degree temperature rise may need no or little policy intervention, given the considerable skepticism regarding the magnitude and distribution of the impacts of the warming process.

These results also suggest the need to adopt policies that ensure continued R & D in solar energy research and in other promising backstop technologies. In fact, given the dramatic rise in environmental consciousness all over the world, carbon taxes could be used to finance R & D as well as mitigate negative impacts, especially in the case of the poorer developing countries. For example, the U.S.

nuclear fusion program has been cut from a level of $357 million in 1995 to $244 million in 1996 (see Department of Energy 1996). Annual federal expenditures in solar energy research are even lower. These research programs can be sustained at much higher levels by using a minuscule portion of any carbon tax receipts.

Our analysis indicates that a transition to the backstop technology may be the only viable solution to the threat of global warming. As such, government policies, while recognizing that fossil fuels are going to be the most economical energy option until about the middle of the twenty-first century, also need to promote the use of solar-based technologies in the longer run. This realization may already be happening. For example, Detroit-based auto companies have active programs to develop cars running on electricity. The California legislature has recommended that by 1998, at least 2 percent of all the vehicles in the state must be run on electricity. The U.S. Department of Energy has granted tax exemptions to the Enron-Amoco solar power plant in Nevada, making its power cheaper than that generated by oil, coal, or gas. The immediate benefits of such regulation can be debated, but promotion of these ideas may be appropriate in the long run.

There are several limitations of this study that could be overcome by further research. One follows from the assumption that energy users have perfect foresight about future prices and can time their investments in alternative fuel-using technologies accordingly. To the extent that this is not so, transitions to new energy sources will be more costly, especially in the retrofitting of existing plant and equipment, and will also require adjustment on the part of consumers. As a result, transition from one fuel to another will be much slower than predicted by the programming model used in this study. Perfect information is also assumed with respect to the cost and demand parameters. The discount rate is assumed fixed. Changes in any of these parameters would affect the results. While the estimates of petrochemical resources on which we have relied include anticipated discoveries, to the best of our knowledge such forecasts do not include the extent to which rising energy prices will induce accelerated exploration. For example, even a decade ago, few analysts would have predicted the large discoveries of oil in the non-OPEC world (e.g., Venezuela) and the emergence of non-OPEC countries as dominant producers of oil.

Each sector could be further disaggregated. For example, the industrial sector could be further divided into different types of industries, for example, petrochemicals, agriculture, mining, and so forth. Resource stocks could be subdivided by quality (e.g., coal of varying sulphur content, sweet and sour crudes), and refining and transportation could be explicitly included in the model. More important, the world could be divided into subregions, each with its own demand and supply characteristics and the option to trade.

Although we have focused on solar energy as the most likely backstop resource, other technologies such as geothermal and hydro may also be important, even if water shortages around the world may make the latter only a limited option. Some energy experts believe that nuclear fusion may be an equally viable backstop technology (see Conn et al. 1992; Furth 1995; Hoagland 1995). In the United States, nuclear fusion is expected to be commercially viable by the year 2040. It is then possible to have two backstop technologies arriving at about the same time, creating opportunities for specialization.

Appendix

This Appendix contains supplementary data tables. Tables A1–A4 provide the basic information for the determination of extraction cost functions. Table A5 illustrates the calculation of the conversion cost for natural gas.

TABLE A1

COST DISTRIBUTION OF OIL RESERVES

	Billion Barrels	5th Percentile: Low Cost ($/Barrel)	95th Percentile: High Cost ($/Barrel)
Cumulative production	681	$0.50	$4.50
Proven reserves	924	$1.99	$6.85
Asia-Pacific	41	$3.50	$16.00
Western Europe	14	$5.50	$15.00
USSR/Eastern Europe	62	$2.50	$8.00
Middle East	585	$1.50	$4.00
Africa	60	$1.50	$8.00
Latin America	119	$2.00	$7.00
North America	42	$6.00	$20.00
Undiscovered	469	$4.52	$17.04
Asia-Pacific	75	$5.50	$25.00
Western Europe	34	$5.50	$20.00
USSR/Eastern Europe	111	$2.50	$10.00
Middle East	103	$2.00	$7.00
Africa	39	$3.00	$10.00
Latin America	23	$3.50	$12.00
North America	84	$10.00	$35.00
Enhanced recovery	97	$12.00	$30.00
Superheavy Orinoco	267	$14.00	$22.10
Bitumen processing	308	$18.50	$30.80
Total	2,746		

SOURCE.—East-West Center Energy Program.

TABLE A2

ESTIMATED LONG-TERM WORLD CRUDE SUPPLY SCHEDULE

Production Cost ($/Barrel)	Cumulative Production (Billions of Barrels)
.00	.00
.50	34.55
1.50	188.78
2.00	312.09
2.50	484.79
3.00	657.48
3.50	830.18
4.00	1,002.88
4.50	1,199.03
5.00	1,346.05
5.50	1,459.02
6.35	1,651.07
10.00	1,824.17
12.00	1,898.56
14.00	1,991.15
17.00	2,200.11
18.50	2,292.79
22.00	2,496.02
30.00	2,733.57
31.00	2,761.60
40.00	2,786.00

SOURCE.—Based on table A1.

TABLE A3

ESTIMATED LONG-TERM WORLD COAL SUPPLY SCHEDULE

Production Cost ($/Ton)	Production Cost ($/Barrels of Oil Equivalent)	Cumulative Production	
		Billion Tons	Billion Barrels of Oil Equivalent
.00	.00	.0	.0
5.00	1.71	100.0	486.7
6.00	2.05	1,100.0	5,353.3
8.00	2.74	2,200.0	10,706.7
10.00	3.42	3,500.0	17,033.3
15.00	5.14	5,500.0	26,766.7
20.00	6.85	7,000.0	34,066.7
25.00	8.56	8,500.0	41,366.7
30.00	10.27	9,000.0	43,800.0
35.00	11.99	9,700.0	47,206.7
40.00	13.70	10,000.0	48,666.7
45.00	15.41	10,500.0	51,100.0
50.00	17.12	10,800.0	52,560.0
60.00	20.55	11,700.0	56,940.0
80.00	27.40	13,500.0	65,700.0
100.00	34.25	14,200.0	69,106.7
110.00	37.67	15,200.0	73,973.3

SOURCE.—East-West Center Energy Program.

TABLE A4

ESTIMATED LONG-TERM WORLD NATURAL GAS SUPPLY SCHEDULE

Production Cost ($/Thousand Cubic Feet)*	Production Cost ($/Barrel of Oil Equivalent)	Cumulative Production	
		Trillion Cubic Feet	Billion Barrels of Oil Equivalent
.00	.00	.00	.00
.20	1.07	1,179.73	220.60
1.00	5.37	2,809.00	525.25
1.50	8.05	6,162.96	1,152.41

SOURCE.—East-West Center Energy Program.
* Roughly equal to 1 mmBtu.

TABLE A5

CONVERSION COST FOR THE RESIDENTIAL/COMMERCIAL SECTOR

	Gas Stove	Electric Stove	LPG Stove	Coal	Solar
Total capital cost (K) ($)	600	500			
Annualized capital cost ($/year)	48.12	40.1			
Lifetime (m) (years)	20	20			
Annual energy consumption per household (mmBtu/year)	23.7	23.7			
Annual operation and maintenance cost ($/year)	90	170			
Interest rate (s) (%)	5	5			
Conversion cost ($/mmBtu)	5.83	8.87	10.8	13.8	12.31
Conversion cost ($/delivered mmBtu)*	7.29	...	13.5	19.71	96.55

SOURCE.—Office of Technology Assessment (1992a).

NOTE.—The conversion cost for LPG stove is obtained by adding the price difference between LPG and natural gas to the cost of the gas stove. For coal, the cost of coal liquefaction is added to the cost of the gas stove (see Grainger and Gibson 1981). The conversion cost of solar is obtained by adding the cost of electricity generation to that of the electric stove.

* Conversion cost for delivered mmBtu is obtained by dividing the conversion cost per mmBtu by the corresponding efficiency factor from table 6.

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Why Do Mexican Americans Earn Low Wages?

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Using Current Population Survey data from November 1979 and 1989, I find that Mexican Americans earn low wages primarily because they possess less human capital than other workers, not because they receive smaller labor market rewards for their skills. Among third- and higher-generation men in 1989, Mexicans averaged 21 percent lower wages than non-Hispanic whites, which is roughly similar to the wage deficit for blacks. For Mexicans, more than three-quarters of the wage gap is attributable to their relative youth, English language deficiencies, and especially their lower educational attainment. By contrast, these variables explain less than a third of the black-white wage gap.

142

I. Introduction

Immigrants from Mexico and persons of Mexican descent constitute a sizable and rapidly growing segment of the U.S. labor force. They are also among the most economically disadvantaged workers in the nation: in 1989, Mexican-origin households earned, on average, 27

For their helpful comments on this research, I thank George Borjas, Will Carrington, Barry Chiswick, Rob Fairlie, Ed Funkhouser, Pete Griffin, Jeff Grogger, Dan Hamermesh, Wallace Hendricks, Fernando Lopez-Alves, Derek Neal, Mark Regets, Cordelia Reimers, Denise Segura, Cathy Weinberger, and an anonymous referee. I am also grateful to the University of California's California Policy Seminar and UCSB's Center for Chicano Studies for research funding, and to Brian Duncan for capable research assistance.

[*Journal of Political Economy*, 1997, vol. 105, no. 6]
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Mr. Schaefer, do you want to react?

Mr. SCHAEFER. Thank you, Mr. Chairman. In our testimony we did highlight the fact that in Utah there is very much an undeveloped rail transportation system. The power plants that are there rely almost exclusively on the Utah coal-mining operations for their future. Most of those mines now are either underlaying or adjacent to roadless areas. The opportunity for bringing in coal from the Powder River Basin is simply nonexistent there.

Then as you look at Colorado and Utah coals, those are both states that have very high-quality bituminous coals, very high in BTU content as opposed to a Powder River Basin coal, which is about two-thirds of the BTUs per similar weights per pound.

A lot of the boilers that are constructed in the United States focus or need a very specific coal quality in which to operate, so as we ship coal from Utah to Tennessee Valley Authority, they need that particular type of coal and in many instances cannot burn a Powder River Basin coal.

We are going to need access to all of our coals across the country—West Virginia, Kentucky, Colorado, Utah and Wyoming—in order to make this—

Mr. PETERSON. Do not forget Pennsylvania.

Mr. SCHAEFER. Pennsylvania. Yes, that is right.

Mr. PETERSON. Mr. Eppink, you were hired by the Department of Energy to analyze roadless during the Clinton Administration.

Mr. EPPINK. That is correct.

Mr. PETERSON. How much impact do you think your analysis had or how seriously was it taken in developing the final statement?

Mr. EPPINK. I think it was seriously taken. It certainly got a lot of attention.

Mr. PETERSON. You caught a lot of hell, huh?

Mr. EPPINK. We did the analysis very quickly. We spent about three or 4 weeks conducting the analysis and probably 3 months defending it so it got a fair amount of attention, yes.

Mr. PETERSON. I am going to give each of the participants no more than 30 seconds to make a statement. Who would like to start? Who is ready to go with 30 seconds? Final comment.

Wait. One final question. That will give you a little chance to think.

Mr. OTTER. Thank you, Mr. Chairman.

This is a five-part question. No, it is only one question.

Mr. Phillips, in 1914, there was probably one of the most devastating fires ever that went 582 miles through my district in Idaho. That is the Western District in Idaho. It burned millions of acres of forest, national forest, went through the Payette, the Clearwater, the Panhandle—gosh, I am going to forget one and offend somebody, I am sure. But anyway, it burned millions and millions of acres of forest. Most of that under a natural process was replaced by species of trees that have a lifespan of roughly 90 to 110 years. Is that not right? I just want a yes or no on that.

Mr. PHILLIPS. That is a tough one to answer because you have a lot of different species in Idaho, depending on the site. If it is lodgepole pine, that is correct.

Mr. OTTER. Okay, it was lodgepole pine, it was some firs and some white pine. But the species, the professionals tell me, will live

to be 90 to 110 years old and that is it. We are right now on that threshold. That forest is going to start dying. There is nothing you can do about it.

During that 1914 fire some of that area was so dense; in fact, one place is called Slate Creek. It is on the tributary to the St. Joe River. To this very day, Mr. Chairman, nothing grows on Slate Creek, areas of Slate Creek, because the earth was calcined so deep that there is nothing there to sustain life, any kind of life. And I think that whole age factor, which we have not talked much about, and the natural life cycle of that forest, we are on the threshold, whether we have a drought or not, we are on the threshold of those trees just starting to die naturally. Am I right or wrong?

Mr. PHILLIPS. I would say you are right in many of those areas.

Mr. OTTER. Thank you.

Mr. PETERSON. Now 30 seconds. Who wants to go first? Raise your hand. Mr. Moyer?

Mr. MOYER. I just want the Subcommittees to consider three things. One is as you look at these roadless areas just consider the high value for habitat they have for a lot of trout and salmon and wildlife. Consider that roads damage trout and salmon habitat especially but often wildlife, wildlife habitat, as well.

And three, I think a real area of common ground that we could work together on is working on maintaining and restoring roads that are part of this backlog that really need work. That would also put people to work in those areas that you were talking about, Mr. Otter, but also restore watersheds and make healthier systems for fish and wildlife. So those are the points that I wanted to make.

Mr. PETERSON. If your groups are willing to help lobby for the funds to fix the roads, that will be welcome because I have been here a few years and that has just been talk in the past. I felt there was a defense against putting money in the roads budget because it was about roads and rightfully or wrongfully, I think that not maintaining the roads has probably caused more problems than anything.

Who is next? Mr. Eppink.

Mr. EPPINK. I just want to emphasize from our study we have done a number of these studies for DOE and elsewhere. This is one of the few studies when we concluded that the fact that a vast minority of the roadless areas contain the vast majority of especially oil and gas resources was pretty striking. I just want to emphasize that point.

Mr. PETERSON. Thank you.

Mr. Phillips?

Mr. PHILLIPS. I wanted to thank the Committee's continued attention to the road backlog that came up a number of times today and recognize that that is a continuing problem. And a reminder that the roadless rule is still under review until May 12.

Mr. PETERSON. Take your time.

Next? I am just trying to be a little spirited. Go ahead.

Mr. SCHAEFER. Thank you, Mr. Chairman. Just three quick summary points.

When we talk about backlog of maintenance of roads, just to make sure you are clear that that is an irrelevant discussion with regard to the coal mining industry because we are solely

responsible for the reclamation of the roads that we construct and any other surface disturbance associated with a mining operation.

I reiterate that the Forest Service lands represent a significant amount of production, coal production, and necessary part of coal production for this country and our energy needs.

The other one is just to again address the fact that if you want to shift coal production, say we do not need these existing mines, the coal can come from somewhere else, that that really ignores the local communities. The final environmental impact statement correctly noted that the economies of these rural Western towns is relatively inelastic and if you take away these high-paying jobs there is just simply not anything to back it up.

Mr. PETERSON. You get the final word.

Mr. MORTON. I just want to reiterate that when you look at the impacts of this policy there are a lot of benefits and you cannot just focus on the negative impacts.

Mr. PETERSON. Thank you.

I would like to share just a thought with you and then I have a closing comment here and we are just about ready to conclude.

I have had the privilege of working on the energy issue seriously for the last few years and about a year and a half ago when it became very apparent that a lot of gas was going to be committed to making electricity, which has not historically been a part of our energy plan in this country, I predicted to my staff and a few people that people heating their homes would pay significantly higher gas bills this year and they did. I do not claim I am some expert about predicting but I had concerns about that. From two to two and a half times they paid more for gas this year.

I am here to predict I think next year will be worse and we are, with our current energy issues—I do not think people in this country really realize that with our current issues and the amount of gas we have already committed to electric generation, I do not think there is going to be gas to put in the ground for the winter season, which is normally how you build up the supply.

And with the inability to repermit hydroplants, with the inability to repermit nuclear plants and the inability to build a new coal plant in this country, I want to tell you we are going to face—I mean California is not going to be alone long; we are going to face serious energy issues in this country.

When you look at all the charts that go out for 10 and 20 years, and I looked at them last week and we questioned some of our finest experts in this country, we are in trouble. And when we are dependent on oil from the most unstable part of the world, certainly not friendly places in the world, this country has gradually backed themselves into a very difficult energy issue.

And all of those things I mentioned in the very slow projected growth on renewables, if you look at the big pie chart 10 years out, 20 years out, they are not predicting a lot of growth. I am a big supporter of hydrogen as one of our futures, personally. I think it may have more potential than any of the renewables.

But we need growth in renewables. We need our hydro to keep running. We probably need to upgrade our nuclear and drill for a lot of oil and gas and dig more coal just to meet the growing needs in this country because what you are going to do is you are going

to hit business hard. The businesses in my district that use energy to melt things, to cook things are having profitless years. A major paper company in my district, their energy budget took away their profitability for the year at the end of January.

It has not hit the streets yet. You think Wall Street has been bad? You wait till some of the lack of profit statements come out from energy. My greenhouse growers do not expect to make money this year because of fuel costs. I mean it is going to hit everywhere. Buying gas in a vehicle is the small part of it. When it starts to get added in and rolled into the cost of doing business and when it happens that quickly, there is no way to raise prices and you are going to find a lot of profitless businesses in this country.

In my view we have an awful lot of work to do and we had better not argue too much and we had better be able to agree on some things because in my view we are in serious trouble in energy.

Closing comments here. It is no secret that if you want broad national policies to be accepted broadly you must get a critical mass of buy-in from the public, both nationally and locally. Polls asking only whether roadless areas deserve protection while avoiding how this should be done do not accurately represent the public's sentiment on this issue. Anyone who really believes that a lasting solution to the roadless debate can be achieved by forcing it through politically at the national level without substantial involvement at the state and local level is delusional. I am willing to work with anyone concerning further protection of roadless areas but never at the expense of effective local participation. These are not mutually exclusive goals; in fact, they can only be achieved together.

I want to thank the witnesses on the second panel for their insights and members for their questions. The members of the Subcommittees may have some additional questions for the witnesses and we ask you to respond to those in writing. The hearing record will be held open for 10 days for these responses.

If there is no further business before the Subcommittees I want to again thank everybody for their participation and this hearing is concluded.

[Whereupon, at 4:42 p.m., the Subcommittees were adjourned.]

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