

**Proceedings: Colorado Water Workshop July 21-23, 1991
From the Dome to the Ditches-Translating Environmental Legislation
into Practice**

Presented by

**Western State College Foundation
Western State College of Colorado**

A stylized graphic of a landscape. It features a black silhouette of a mountain range with several peaks. Below the mountains, there are several horizontal, wavy lines in black and teal, representing water or a river. The graphic is positioned on the left side of the page, extending towards the center.

Colorado Water

Resources Research Institute

Information Series No. 68

**Colorado
State
University**

PROCEEDINGS:

COLORADO WATER WORKSHOP
JULY 21-23, 1991

Presented by

Western State College of Colorado
Gunnison, Colorado

From the Dome to the Ditches:
Translating Environmental Legislation into Practice

Colorado Water Resources
Research Institute
Colorado State University
Fort Collins, CO 80523
Robert C. Ward, Director

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INTRODUCTION

The 1991 Colorado Water Workshop was held July 21-23, at Western State College in Gunnison, Colorado. For 16 years this annual conference has provided a valuable forum for frank discussions of water issues facing Colorado and the arid West. The 1991 Water Workshop focused on the progress and problems created by environmental regulations which affect water use.

Thanks to the assistance of the Colorado Water Resources Research Institute, a printed volume of the conference proceedings is available for the second consecutive year. Western State College thanks and commends all sponsors of the Colorado Water Workshop for their support of education on water resource issues.

--Lucy High
Director, Colorado Water Workshop
Gunnison, Colorado

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Opening Remarks

Michael Callihan
Lieutenant Governor of Colorado

This is the Sixteenth Annual Water Workshop, which is an impressive accomplishment. I have kind of a two-fold role this morning. One is to welcome you, and I'm going to do that. And I'm not going to give you the standard Chamber of Commerce speech. You all know Gunnison and it's delightful. It's been my home for twenty-one years. After leaving Western State College, (it took me five years to get a four year degree) I decided to stay in the valley and have gone on to serve the people here in a number of capacities, most recently, as Lieutenant Governor. But I do live here, and you know the beauty of the place. And you also know this is a timely and appropriate location for this conference.

I don't think anyone who originated the original Water Workshop sixteen years ago had any idea how the future would unfold, or that we would be here in 1991 just twenty-four hours before final arguments are heard a few blocks away in the courthouse on one of the major, really landmark, water cases, here. The final arguments, eight hours worth of them, will begin tomorrow morning. If you are going to get a seat, I suggest you go early. That is going to be a major case. Additionally, Gunnison seems to be at the focal point of some kind of new dynamic creativity or dynamic tension, trying to in a micro way solve and address a lot of the problems that are confronting all of us in the Colorado basin.

I think really the issue locally, the issue that you're going to be wrestling with at this conference and in future ones, is the issue of self-determination. Who has the right to decide? I think that is the fundamental core of what the argument's about tomorrow, and what many of your workshops today will be focusing on, as well as what is going to be brought to focus nationally.

The last sixty days none of us could have missed the fact that both the National Geographic and most recently Time magazine have featured the Colorado River. If you haven't picked this issue up, I'd recommend you do that. The fact of the matter is control, or the battle for control, or perhaps even the focus for control of the Colorado River is shifting eastward, to the east, to the U. S. Congress.

Let me quote Congressman Miller from California, as quoted in Time. "The heart of the West is water. It's about winners and losers, the future and the past. It's about economics. It will be the most important commodity in dictating the future. It's the most serious confrontation the West has engaged in 100 years." What Time neglected to add to that was that Congressman Miller is the chairman of the House committee on the Interior and Insular Affairs, and a very influential person.

The focus is shifting, the control of the Colorado River, to the east. And it's interesting that California has its Congressmen very much in positions of influence, particularly Congressman Miller as Chairman of the Interior Committee.

I think, then, that we're at a sea change, on the Colorado River. The issue for us is one of self-determination, much as it is on a very micro level here in Gunnison in regards to Arapahoe County and the issues of Union Park. But our challenge is how those of us who are consumed by the issues of the

Colorado River can manage to retain control and determination of that river. And it's going to be very difficult. I've something of a reputation of being a minor predictor of trends, but one that I don't think even requires much skill is the fact that this situation following the decision which will come out of the hearings tomorrow, following the new attitude in Congress, the new attitude among many Eastern seaboard representatives and senators, is one of concern over this river in a national sense, and the issue is going to be who determines the future.

We have a very narrow window of opportunity. I don't know whether it is one year or five years. But we are faced with a very narrow window of opportunity for us to keep control in a new way. I have several suggestions for you. I honestly believe we need to look at electing every member of every water board in the system, particularly here in Colorado. This gives you more flexibility and more representation. Such a plan would also send a signal to those who are watching, in Congress and elsewhere, that we understand that for the last seventy years we've done a fairly decent job but not a completely perfect job of managing the system, and that by putting in elected boards we're recognizing the change that is coming, the change in Colorado as well as our political system, and we intend to maintain the control of that by using a more representative and open system of electing the members to the different water boards. Electing members to those boards also sends a signal to ourselves: We recognize the need for all the issues of water on the Colorado to be phrased and couched in terms of our own future and our self-determination.

I'm really concerned about the fact that as we sit and fight and argue and twist arms locally and even with our six sister states, the power is shifting to the East. Reapportionment will be a reality in less than 12 months. The new Congress that will be elected shortly after that will be heavily tilted away from us one more time. So as a concluding thought, let me encourage you. Think of all the issues we are confronting at this workshop and in our daily lives when it comes to water in this state and in six other states in the area of determination. Who will decide? The West has traditionally been on the short end of those decisions, and I'm afraid history is about to repeat itself in going back and shifting the political power back to the Congress. The compact, the root of the whole issue, is after all nothing more than a creature of the U. S. Congress. Before that is totally on the table again, I think we can take some concrete steps beginning with electing board members, and wrestle that control back, and change that before it becomes a fiat, keep control of our own future, here in our own state. Thank you.

Reauthorization of the Clean Water Act: Implications for Colorado

Bennett Raley
Legal Counsel, Senator Hank Brown

I'm busy learning a lot back in Washington, D.C. The first thing I'm trying to learn is how to sweat with dignity. I've got the first part down, I'm sweating very well, but the dignity part escapes me. I view the day as a success if I can get into the office in the morning without feeling like I've taken a bath with my clothes on. We've had record heat waves back there and I'm still trying to get acclimatized.

I'm learning a lot of things. My first day at work, I walked through, or tried to walk through, the security gate to get into the Senate office building and the guards pulled me aside and searched me. I thought that was a rather rude way to greet me, and I thought maybe it was because I worked for a Republican senator. There are not many of them back there so I thought we'd probably get harassed some. But what it was was I had a couple of paperweights in my briefcase. For years I've used as paperweights a couple of spurs. One was my grandfather's spur, a hand-made spur made years ago. The other was a bronc spur that I used for a very short period of time when I thought maybe that that was something I could do. I lit on my head very frequently, and shortly thereafter decided to go to law school.

Anyway, when my bag went through the security system, they didn't like that at all. And they searched everything I had in my possession, and they wouldn't let me go through until I promised not to use those spurs on any Democrats. So, I'm still learning, still trying to find out the important things, like where the bathrooms are and how to get from one building to another without getting lost in tunnels underneath all the buildings back in D.C., but it is an exciting place to be.

The Clean Water Act Reauthorization, for me, is a focal point of what will be one of the more important debates for the future of the West and Western water development that's going to occur in the next five to ten years. There are a number of opportunities for conflict between federal programs and state water allocation systems: endangered species, special use review process of the Forest Service, the Federal Reserved Water Rights, the Clean Water Act. There are quite a number of them, but you may or may not face the threat of endangered species issue if you develop water. You may be able to get your special use permit from the Forest Service. Those are problems that are very important if you face them, but if you are going to develop water, there's no way you can escape the Clean Water Act. And the future of the Clean Water Act and how it's reauthorized in the coming years will define further the line between Colorado's system and the federal system.

What I'd like to do today is set the stage for the fellows who will follow and discuss these issues in greater detail. First of all, I'd like to quickly run through the structure of the Clean Water Act. Now I'm not going to bore you with a lot of quotes and cites, but talk about the components of it. And the second thing I would like to do, since Errol Tyler couldn't come from the House to talk about current

legislation, is briefly touch on the bills that are in Congress right now, at least the ones that I know of, that relate to the Clean Water Act Reauthorization.

I will start with the Clean Water Act. I think you've probably been through it before so I'll make this pretty short. The Clean Water Act is the current way to refer to the Federal Water Pollution Control Act that was put in place in 1972, as changed by the 1977 Clean Water Act Amendments and then the 1987 Clean Water Act Amendments. All those laws put together are commonly referred to as the Clean Water Act. The Clean Water Act was spawned by the national outrage when the Cayuhoga River and other rivers were catching on fire and were literally unfit for use of any type. There was national outrage that we would degrade a resource to that extent. And people also realized in the East and in the West that in order to use water, you've got to have two things. You've got to have enough of it, and it's got to be clean water. Otherwise, you can't use it and it doesn't do you any good. And it's a very difficult issue because most people were at both ends of the pipe. They drink it and they want to get rid of it. So they want clean water on the one hand and they want to get rid of the water on the other hand. That involves treatment and discharge. Same thing for an irrigator. You want water up high above the fields in storage, but then you've got return flows coming back to the stream after you've irrigated.

So the '72 and '77 Clean Water Act was the federal program put in place to address this national concern over water quality. And the way it was set up it had several major components. The first component that was addressed was point sources. We had a major problem with huge pipes spewing effluent, gray sludge, and whatnot into the nation's streams and lakes, and we've got to address that issue.

The Clean Water Act focused on point sources in large part for two reasons. One, you could find them. They were relatively easy to identify, because they were discreet point sources. That's where the name came from. And you could track them back and find the activity that was responsible for that discharge of water. The second reason the Congress and the Clean Water Act focused on point sources was that it did not necessarily get into the very political and controversial issues associated with the other type of pollution that impacts water quality: non-point sources. Non-point sources largely involve land-use decisions, and when you start talking about non-point sources, you're getting very close, if not into, what has been the traditional prerogative of the state, and that is land-use regulation and zoning. So, for political reasons, Congress didn't want to leap into that area either because there was a lot of resistance from the states to Congressional usurpation of that responsibility.

So the Clean Water Act set up a regulatory scheme that was largely aimed at point sources. It did it through a system of classification and standards. While EPA can set the classification and standards for water bodies within the state, the contemplation of the Clean Water Act was that the states would take over the program and that they would be the ones that would classify the state waters. Classification means you take a segment, a particular lake or a particular section of stream, and you say, "What are the uses of that water that we're going to protect?" The Clean Water Act required that you protect all existing uses and reasonably foreseeable use.

In Colorado, the Water Quality Control Commission is the entity that took the responsibility for the

state-delegated Clean Water Act Enforcement Program under the Clean Water Act. The Commission categorized existing uses, classified the streams for those uses, and then looked twenty years in the future and also identified those as classified uses for the streams. You then have the classified uses, and you set standards. I'm talking just generically or conceptually. You set standards so that people who discharge into that stream segment won't degrade the water quality below what is required for the use that was identified in the classification scheme.

You have the focus on the point sources. You have the regulation of those point sources to achieve the protections identified in classification and standards, and that was where, I think, in truth, most of the money and the effort went for the first eighteen years of the Clean Water Act. It was spent on developing and honing that aspect of water quality regulation. But there are some other important components in the Clean Water Act, and attention is shifting, I believe, from the point source to some of these other aspects of the Clean Water Act Program.

Another important component of the Clean Water Act that will become increasingly more important, is the 401 certification. Under section 401 of the Clean Water Act, states have the obligation to certify that a federally issued permit won't cause a violation of water quality standards. So it was an attempt, particularly aimed at the section 404 program, to give a state a check-off on a federally issued permit. So you've got the classification standards, you've got the point source regulation under section 402 of the act, you've got 401 certification, which is a state check-off on federally issued permits, and then you've got 404, which was designed to address a particular type of a discharge.

Section 404, I believe, was severed out and treated differently than point sources for some historical reasons. Section 404 really was the dredge and fill program that was a successor in many respects to the Rivers and Harbors Act, passed last century, which gave the United States Army Corps of Engineers the responsibility of protecting navigable waters so that people didn't build bridges or dump dredged materials in navigable channels and block this important passageway for commerce. Section 404 is designed to do that, but also picked up other sorts of activities, and the 404 program has changed, some would say mutated, to encompass a much wider variety of activities. The one that is most currently the focus of public debate is the wetlands program, which is far removed from the original Rivers and Harbors Act mission of the Corps. Its intent is to protect water quality aspects of wetlands through regulating the discharge or dredge and fill of material in those wetlands. So 404 is the other component to the Clean Water Act.

The final issue I want to identify for you is non-point source pollution. Originally, non-point source pollution was to be addressed through the 208 plans, which were to be regionally developed plans that did a number of things, including look at the siting of water treatment plants and do some planning with regard to 208 activities of non-point source pollution. There was a period in time when a lot of time and effort went into 208 plans. However, for political and, I think, economic reasons, 208 plans didn't mature into much of a regulatory or even a structured program to address the major non-point source pollution categories.

The attention was shifted in 1987 when Congress adopted section 319 of the 1987 Amendments.

This was basically a federal signal that we wanted to revisit this issue of non-point source pollution. The cheap and easy solutions to water quality had been achieved. We have largely, I believe, tracked down the pipes that were unregulated and spewing effluent into streams, and they are now regulated. So, they're in the system. There are further modifications of the point source regulation program. It has gotten very sophisticated, very technical, and that's continuing, but the perception back East was that the greatest marginal return for investments in water pollution control would come from shifting attention to non-point source pollution.

Non-point source pollution encompasses a number of categories: agricultural, silvicultural, mining runoff, and the one most relevant to this group, hydrologic modifications. And again, the inclusion of hydrologic modifications in the category of non-point source pollution is another historical accident. After the Clean Water Act was passed, the environmental community said, "Aha, there are dams up there that are changing the water quality, because those dams trap the water, they change the temperature, they change the chemical constituents of the water, and then they discharge it into a hole. That is a point source under the Clean Water Act, and therefore the EPA has to regulate all the dams in the nation under the 402 NPDES Point Source Regulatory Program." That case was litigated in the federal courts, and at the time, EPA's interpretation of the law was that section 402 of the Point Source Regulatory Program only included those activities that added or created a pollutant from a point source and discharged it into the water, and that dam-induced water quality changes, like changing the temperature just by holding it and letting solar radiation warm it up more than it would be if it flowed on down the stream. That was not a point source within the meaning of the Clean Water Act. If it wasn't a point source under the Clean Water Act, then it had to fall into the other category of non-point sources.

There were a couple of interesting sidelights to that debate after the environmental community lost in that case. Environmentalists came back and said, "Okay, how about a hydroelectric facility that chops up fish and discharges those parts into the stream?" They said that the hydro facility that's discharging the fish parts is a case of the discharge of pollution from a point source, and that it should be regulated. That went up to the Appellate Court, and the court rejected that interpretation of the Clean Water Act and held that those fish weren't added by the dam, and while their form had been changed somewhat, it wasn't enough to bring them under section 402, or the NPDES program. That was the general framework for the Clean Water Act, and really is what we're working with today.

Now, what is the basic relevance of the Clean Water Act to a water project? Well, it's pretty simple. It's all-pervasive, because a 404 permit is required for any meaningful new water project, and to get a 404 permit, you have to have a 401 certification. The environmental community takes the position that a 401 certification requires the state to certify that the issuance of that permit will not result in the violation of the stream standards that were set under the complex standard and classifications system that has arisen under the Clean Water Act. So then you have arguable stream standards being applied through the 401 certification to a water project that is receiving a 404 permit. Then finally, that dam sitting on the stream is going to be clearly a non-point source of pollution under section 319. Colorado has just spent two relatively painful years trying to develop the best management practices

associated with the 319 program to look at how you address dam-induced water quality changes as a part of the 319 directed non-point source management program. So, the Clean Water Act, pretty much every component of it, has arguable relevance to new water projects. But, it doesn't end there.

When I talk to people, they elevate the Clean Water Act, in terms of importance, higher than the Threatened and Endangered Species Act, higher than any other potential impact on water use in the West. The theory behind the Clean Water Act was not, "Let's just regulate those in the future." Often in the zoning context, for example, existing uses or existing practices are grandfathered in and allowed to exist free of the new regulatory requirement. The Clean Water Act did just the opposite. The Clean Water Act first went back to those pipelines and brought them into the system and regulated them, and the fact that they'd been polluting for a hundred years or fifty years or whatever was no defense to regulations under the Clean Water Act. I believe that the same issue is going to be presented if and when non-point sources, i.e. hydrologic modifications, its dams and diversions, are brought more fully into the Clean Water Act regulatory program. What is at issue is not just the future of projects in the West, but the yield and operation of the existing projects that we have had here in the West since it was settled.

I'm not saying what's going to come out of that, but what I believe will happen is that existing projects will either directly or indirectly be brought under a program that looks, talks, and walks like a regulatory program. It's the duck test. It's going to have some compulsory requirements that will look at issues of water quality impact caused by those regulatory activities. The debate would be when you as the owner of a water project are brought into the Clean Water Act regulatory arena more directly. What changes in operation will be required, including, theoretically, releases from storage or bypasses of water that you could divert? What changes in operation will you agree to or be required to implement under what I think will be the new Clean Water Act requirements, if not in the next couple of years surely within the next ten years?

And how will that come about? Right now you do not have a regulatory permitting requirement for existing projects. It will come about one of two ways. The first and easiest, the one that's been mentioned explicitly by the EPA for a number of years, is cross compliance. If you have to get any other federal approval or permit, no matter how small, or if you change your operation in any way, you have to at the same time certify that you are in compliance with this other program. So, while section 319, the Non-point Source Regulatory Program, is voluntary, and would theoretically remain voluntary, the easiest thing to do to make it look, talk, and walk like a regulatory program would be to condition all other federal and perhaps state approvals and permits on a certification that you are in compliance with the voluntary program under section 319. That's the easiest way.

The other way, the more direct approach, would probably follow that. That would be to put in place a regulatory framework, a permitting requirement for non-point source pollution. There are people who are suggesting that be done. I think that it's not going to happen in the immediate future, but if the voluntary best management practice approach of section 319 doesn't work, and cross compliance doesn't achieve the desired results in the minds of whoever is doing the judging, the next step will be an attempt to make it a regulatory program.

Let me shift to talking about the current bills on the Hill that I'm aware of and their relevance to this issue of water quality and water development. I agree very much with the Lieutenant Governor that the issue here is, as he put it, self-determination. I characterize it as state prerogative. The issue is who's going to make these decisions. Because there's no question that there will be decisions made balancing water development and use needs against other resource needs such as water quality, environmental, and aesthetics. All of those judgements are going to be made and the issue is, who's going to make that decision? You find this issue present in a number of bills that are currently on the Hill.

Let me start with the one that's attracted the most attention. That is the 404 program, because it's gotten the most ink in the national press. You have Louisiana shrieking that the whole state is a wetland, and if the 404 program is enforced under EPA's current interpretation, they'll never be able to do anything. Alaska's making much the same argument. And what has happened is that some recent changes in the 404 program have, I think, changed the political realities and made it more likely that there will be some change in the 404 program.

Two things have happened. Over the last five or six years there has been a distinct reluctance on the part of Congress to address the 404 program. They simply didn't want to do it. They had no interest in doing it. In 1989, the EPA and the Corps, Fish and Wildlife Service and SCS promulgated what is known as the Wetlands Delineation Manual. This manual was an attempt to provide uniform criteria for defining wetlands by all federal agencies. Before that, we had the happy situation of the Corps saying we're going to use this definition, EPA saying we're going to use this. Fish and Wildlife used yet another one, and the SCS used another one, and that made for good confusion and made the lawyers quite happy because you can always make money out of confusion. They said let's stop that. Let's at least use the same definition and talk from the same book.

So they promulgated the manual, but the manual was perceived by the regulated community to be a dramatic expansion of the reach of the 404 program. Theoretically it said that things were wetlands if you met three different criteria. The one that really attracted the attention of the public was the standard that if you have land that was saturated, not inundated, but saturated, and not saturated at the surface but eighteen inches under the surface for as little as seven days a year, you could have something that would be characterized as a wetlands and therefore subject to the permitting requirements of section 404. All of a sudden you had people who had lots that they were going to put a retirement home on, and you had small developers who were going to develop an area and they were told they had to go get a 404 permit. So 404 shifted from being a battle between the water development community and the environmental community or a battle between the oil and gas community and the environmental community. It shifted to something that reached down and affected home owners. There were outraged letters to congressmen, and all of a sudden you started seeing some interest in changing the 404 program. The National Association of Homebuilders certainly helped that along and a lot of other people have been active in it, but I believe what really changed the climate back in Congress was the widespread and diffused impact of the 404 program under the more expanded definitions of the scope of the program.

The second thing that happened was the Corps and EPA entered into a memorandum of agreement that said this is how we're going to enforce the wetlands requirements. We're going to enforce sequencing, which means you first have to avoid impacts to wetlands if you can. If you can't avoid impacts, you minimize them, and only after you have minimized the unavoidable impacts can you mitigate. What that did was force the Corps to change its way of doing business because before there'd been this iterative horse-trading process where the applicant would go to the Corps and say, "I want this permit," and the Corps would say, "No, that's not enough mitigation, give me ten more acres." They'd structure it and the Corps would find it to be in the public interest and issue the permit. Under the sequencing memorandum of agreement, the Corps can't do that any more. The Corps doesn't look at mitigation offers when it's reviewing the permit application to see if there has been the proper avoidance and minimization. That had a dramatic impact.

There's a famous case where a developer of a shopping center who bought a swamp in New Jersey, Sweden's Swamp, was denied his permit. He was denied the permit because he didn't buy a lot that was adjacent to or was in the same area to the one that he bought that didn't have any wetlands. By the time that the permitting process was ongoing, he was unable to buy the other lot because his competitor had bought it. EPA said, "That's fine, that's too bad."

The Comprehensive Wetlands Conservation and Management Bill of 1991 is the House bill that proposes dramatic changes in the 404 program. That house bill has around 150 sponsors. That same House bill was introduced last week by Senator Breaux from Louisiana with nineteen sponsors on the Senate side. It would make dramatic changes in the Wetlands Program, with obvious impacts on water development in the West.

Just the basic structure of that program would take the EPA completely out of it. It would categorize wetlands according to value. It has a compensation component to compensate land owners if their lands are characterized and protected at the highest level. It also contains a number of very controversial aspects. There are about five other Wetlands bills on the House side, some of which are more favorable towards Wetland protection, including one that would create an Office of Wetlands Protection in the Fish and Wildlife Service. There is only one that's been introduced on the Senate side so far and it is viewed as a very radical change to the 404 program.

Let me move to 401 certification. There are two bills that address it. What happened was the Supreme Court held that a state did not have the right to condition a Federal Energy Regulatory permit issued for a hydropower project to protect downstream minimum stream flows, the Rock Creek decision in California. That outraged the states, and so Senator Jeffords from Vermont has introduced one bill that would change section 401 and Senator Symms from Vermont has introduced another bill that would address this issue by amending the Federal Power Act. So there are two bills going on that address the State's role in permitting projects through the 401 certification.

Standards, the other component I talked to you about, are undergoing significant changes. The Federal Clean Water Act Reauthorization has been pieced off in Congress. The 404 part of it, because of the controversial nature of it that I talked about briefly before, is addressed in separate bills. S1081,

which was introduced by Senator Baucus back in April, I believe, is the bill that supposedly reauthorizes the remainder of the Clean Water Act. It has some wide-ranging changes that are very relevant to water development in the West. I believe that S1081 ratifies and makes legal something that I don't think is clearly legal under the existing Clean Water Act, and that is the shift of the EPA from the standard of a chemically-based definition of water quality. In other words, according to chemical standards, you sample water and see what you find. New standards would be defined by physical and biological integrity. That is being done by EPA through the biological criteria of standards guidance that's been promulgated by EPA. The commission, I believe, has scheduled hearings for a year from this fall to address this very important issue. Let me briefly talk about the importance of it.

The biocriteria has been referred to as the "happy fish test" in the literature. I didn't make that up. What it does is take a reference stream that's been unaffected by human activities. It says: take a reference stream, and then use that stream and attempt to upgrade the streams that have been affected by us to achieve the same diversity and the same ecological habitat, ecological integrity as you find in the pristine stream. Let me give a dramatic example. Maybe it's too far-reaching, but I don't think so. If you define the natural stream and the water quality standards applicable to a stream by reference to pristine conditions, and you then take water out of the stream, there will be part of that aquatic habitat that isn't there anymore or is at least severely impaired during the times when you are making a diversion. And so, I would suggest that if biological criteria is ratified, if EPA's interpretation of the law under the existing act is ratified by Congress in S1081, which has specific reference to the biological criteria concept, that standard will later be used to condition or restrict existing and future water development projects.

A second way that the standards in the Clean Water Act are going to be shifted under S1081 is that EPA is proposing that all stream segments be designated as fishable/swimmable. Right now the commission has designated some but not all. S1081 says basically that unless you meet certain exemptions, you designate all segments as fishable and swimmable. I for one am never going swimming down below the Denver Metro outflow on the South Platte. I question, severely question, whether or not that is technically or economically possible but that's the way that S1081 is phrased, and if all streams are to be fishable/swimmable, it's not unreasonable to assume that EPA will insist that the water be in the streams so that you can have the fishing and swimming that's envisioned by those terms.

The EPA also has a proposal for river basin management, where there would be multi-state conferences and management plans developed for rivers. I think that has a tremendous political impact on the West. Although the Colorado is not one that has been named in the original act, if, for example, the Colorado were subjected to that sort of river basin management, you would see, I believe, control of the Colorado River shift from what is right now a combined federal-state relationship under the compacts and Bureau of Reclamation and state systems, to one that is dominated by EPA.

There's another related issue that's going on in the United States Supreme Court right now. Oklahoma versus Arkansas is addressing the issue of whether the water quality standards of the downstream state can be applied to a condition or prohibit an activity in the upstream state. Remember

when I talked about how standards may be expanded to include biological criteria, fishable/swimmable? Then you take those standards from downstream states, apply them to water development use in Colorado, you have a new status quo.

Finally, let me discuss section 319. The current versions of 1081 don't have any radical changes in section 319, but rumors that I hear are that there will be some changes to make it approach more closely a regulatory program. I hear that they're looking at the Coastal Zone Management Act, which is also being looked at in the Wetlands context, as maybe a model for enhanced regulation or something close to regulation of non-point source activities. We are likely to see such amendments to existing 1081 when that bill goes to markup. The timing of that is that the committee held hearings last week on S1081, including hearings attended by William Reilly for EPA, talking about wetlands, even though there's not a wetlands component to the bill. The Senate committee is proposing to go to markup with that bill some time this fall. Whether or not they will get it out of the Senate before the end of this year, I don't know.

So, I think I've taken my time and Melinda's as well, and I apologize for that, but I did want to just summarize some of the issues that are being focused on back East and to highlight that the status quo may well be changing. I do want to end I with one comment. I was listening last night to the debate and the obvious interest of the people in the Gunnison Basin in protecting themselves against the transmountain water diversions. And, if I were in the Gunnison Basin, I would be sitting here saying, biological criteria, protection of the natural environment, sounds like a real good idea to me, but I would point out that that is a double-edged sword, because at the same time that EPA is proposing biological criteria, EPA is also proposing to regulate return flow from irrigated agriculture. The standard of biological criteria would not only be applied to transmountain diverters, but would also be applied to the diversion and use of water in the West Slope. So that is one weapon that could be used in the battle against transmountain diversions, but in my view it might be a little bit like burning down your house to get rid of some fleas.

**Reauthorization of the Clean Water Act:
Implications for Colorado**

Melinda Kassen
Attorney, Environmental Defense Fund

I must admit, Bennett and I talked about this a couple weeks ago. I sort of feel a little bit like a warm-up. I think the real debate is probably between environmentalists and developers coming in the next session this morning between Marc Reisner and Greg Hobbs. And, in addition, as you look at the name of this Western water session, "From the Dome to the Ditches: Translating Environmental Legislation into Practice," I think most of you who are not lawyers will feel fortunate that Bennett and I are the only two who are actually supposed to be talking about the law. Everybody else is supposed to be talking about the practice. But it may be necessary to have a little bit of a framework about what the law is and what the issues are.

It is important to remember that Colorado and the interior part of the country, the arid West, are not driving the Clean Water Act debate. The Clean Water Act debate is being driven by people who live on the coasts, and people who live in the populated areas of this country. And their concerns are totally different. From the environmental community standpoint there is a Clean Water Act agenda. The Environmental Defense Fund is actually not signed on to that agenda, but the number one issue for the environmental community is toxics and it's also going to be a major part of the Clean Water Act Reauthorization.

Many of the issues that are driving the debate are problems which don't exist here. For example, combined sewer overflows, where you have raw, untreated waste water going into discharges to surface water because their sewer system and their storm water runoff systems are part of the same system. There are all kinds of issues that are not that important out here and are critical for the debate. By the same token, hydrologic modification and the interaction between water development and the Clean Water Act are relatively unimportant back on the Hill inside the Beltway, where Bennett currently lives.

So, we can talk about all of these issues and you can come away thinking that Clean Water Act Reauthorization is going about this totally wrong, but what you need to remember is that by the end of this century, 80% of the population in the country will live within fifty miles of the coast. So there's a reason why you see a focus on issues that are not all that important to you.

Just to dramatize this a little more, the pollution prevention and toxics control will be a major focus of the Clean Water Act. One of the goals of the Clean Water Act, a goal which I don't think anybody out here takes seriously, and I didn't really think anybody in the country took seriously, is the zero discharge goal. There was supposed to be zero discharge of pollutants to surface waters in this country by 1984. Well, we didn't make that. And I think people out here, you know, you laughed, who are they kidding? Well, guess what? Zero discharge of toxic pollutants is about to become a reality, an enforceable program in the Great Lakes. The attitudes elsewhere in this country, about pollution

prevention, about toxics, about what is achievable, and about what the states are willing to achieve, are dramatically different from the debates that go on in this region. And it is those debates, it is the Great Lakes debates, which are going to shape major elements of the Clean Water Act, particularly with regard to toxics.

I'm going to talk about wetlands in a minute and you're going to hear a lot about wetlands later in the program. But the recognition about wetlands is that this country has lost half of its wetlands in the last 200 years. In the last 20 years, we've lost 230,000 acres. Louisiana used to lose 200,000 acres a year. Louisiana used to lose 60 coastal square miles of wetlands annually. It's down now to 30 square miles annually, but that's a lot of real estate. And, the other thing is, when you think about why we're losing wetlands, it turns out that between 1955 and 1975, 80% of the wetlands that were lost were lost to agricultural draining. Section 404, which Bennett talked about, looks at the discharge of dredge and fill material into wetlands. Right now draining of wetlands is not covered under the Clean Water Act. In addition to looking at the definition of wetlands, and in addition to looking at the sequencing issues, the other issues that is up there for debate is: If we're going to look at protection of wetlands, because of all of the values that wetlands provide in an ecosystem, it's also important to look at the activities, and if there's a threat to agriculture, it's going to be this notion that the draining of land constitutes as much of a threat to wetland as the filling up of the land does.

One of the reasons that the Clean Water Act has not been as contentious as some other acts is that in a lot of ways, notwithstanding all of the money that's been spent, it hasn't worked very well. Twenty years after the Clean Water Act initially passed, in 1972, it turns out that the majority of the streams in this country are still polluted and they're polluted by non-point sources of pollution, polluted runoff from a variety of activities. We've created some cottage industries in pollution prevention in all of the technologies trying to keep toxics coming out of the end of the pipe. But as a practical matter, twenty years later, we haven't made an awful lot of progress.

The Clean Air Act, which was reauthorized last year, took ten years to reauthorize. That act was highly controversial over and over again, repeatedly, the stakes were very high. In 1987, when the Clean Water Act was last reauthorized, it only took three or four years. We don't really know what's going to happen yet. One of the reasons that it may take longer this time is because there will be real changes, real changes that sound draconian the way Bennett describes them. But they are changes that are designed to actually reverse some significant trends. It's possible that that will happen. It's also possible that, because Congress, at the same time that it's dealing with the Clean Water Act, is also dealing with the hazardous waste law, the Resource Conservation and Recovery Act (RCRA), which is a big issue, again, less so in Colorado but definitely a big issue elsewhere in the country. They've got to reauthorize that too. It may be that the Clean Water Act will skate through with relatively minor changes because Congress is going to end up spending a lot more time on reauthorization of RCRA. That's a practical matter; we're talking about the same committees in Congress who are responsible for both. If it's going to involve major changes, it's going to take longer than the next couple of years. If Congress decides just to do some fine tuning and tinkering, it will only take a couple of years and they'll defer major

changes until the next round.

I'm going to try to talk about four things: non-point sources, wetlands, biological criteria, and settlement standards. Again, there is a whole other agenda for the environmental community which I'm not talking about, things like beefing up enforcement, closing up some of the loopholes on citizen's suits. 404, the wetlands program is a great example of that. There is no citizen's suit provision. So, if somebody gets a 404 permit and then promptly proceeds to violate it or ignore the conditions, there's nothing that citizen groups can do. You have to wait for the court to act, and you could wait forever for the court to act to try to enforce its own permits for pollution prevention. But I'm going to focus on those four aforementioned areas as they relate to Colorado.

Non-point sources. You started out with this local program 208; it didn't do anything. In 1987 Congress added section 319, making it a state program. States were supposed to identify water bodies affected by non-point sources and then adopt statewide best management practices for this list of activities: agriculture, silviculture, mining, hydrologic modification. And the states were supposed to present those programs to EPA. But that was it. No trigger, no hammer. Colorado is very proud of its totally voluntary program. What does that mean? That means you can choose to do it or not do it. What does that mean in terms of environmental protection? It means that there isn't any.

Besides that, there are state programs which have wildly different best management practices for the same kind of activity. They are inconsistent with each other. They're vague. They're unenforceable. One of the reasons that the states haven't done a lot, is that Congress promised the states \$400 million to go out and do special projects and show that we could really clean this stuff up. Congress only appropriated \$89 million of that 400, so there was not a lot of money, the states didn't have a lot of incentive to go out and do anything.

In Colorado there is a lot of talk among the lawyers about hydrologic modification, and how this is going to affect water development. I should point out that the states' assessment, this identification of water bodies that it had to do a couple of years ago, found that half of the impaired streams are impaired as a result of agricultural practices. Nationally, we're talking about 1 billion acres in agricultural land, so that when you think about trying to create a program that is going to change agricultural practices so that one minimizes the effects on the streams, clearly, that's an undertaking that's hard to comprehend. It's hard to think about how we would really go about doing that. But that's the scope of that problem.

A third of Colorado's streams are impaired as a result of mining activities. So, while hydrologic modification may get a lot of attention in terms of the debate, and , "Oh, what is this going to do, and is it going to change our entire way of life forever and ever? These have to be controlled," that's not what is actually causing most of the problems. What's causing most of the problems is agricultural runoff and mining runoff.

The Congressional solution is right now in Senate bill 1081 which is relatively modest. What's coming is the grafting of the Coastal Zone Management Act, which was passed last year. So what I'm going to do is to tell you what the Coastal Zone Management Act does. All coastal states are to develop

management measures for all activities that affect all coastal waters and submit these plans to EPA and to NOAA, the National Oceanic and Atmospheric Agency, by 1994. In the meantime, EPA is supposed to adopt guidance on how to develop these management measures, and that guidance is out in draft now and it's supposed to be final by April of 1992. And, the criteria are management measures. So, folks, this is states doing land-use planning. All right, this is states telling local communities along the coast, communities where there are activities that are adversely affecting coastal waters, how they're supposed to do their zoning, how they're supposed to do land management. That gets a lot of people's backs up, and it sounds really extraordinary. But Congress passed this law last year, and there was relatively little ranting and raving and screaming. One of the reasons is that we're losing coastal resources at an extraordinary rate. But it's a toe hold, and you have to see it as that. It is the beginning of thinking about land-use management and the way it affects water quality in the nation. It's already started. This act affects whatever is done by the thirty states that are situated on the coast. So a majority of states are already developing land use management measures subject to evaluation by national agencies.

So, coastal states are supposed to come up with these management measures and EPA is supposed to adopt guidance to help the states do that. The management measures and the EPA guidance have to be economically achievable. In other words, like best available technology under the Clean Water Act. They have to apply, and Bennett talked about his fears about this, to new and existing categories of non-point sources. The EPA guidance is supposed to be designed so that these measures achieve the greatest degree of reduction achievable, which means that the best available technology is used.

I'm talking about a law that is in place. I'm watching all these eyes roll out there. This law exists, at least for coastal zones. The states are supposed to be looking at practices, technologies, processes, siting criteria, operating methods, or other alternatives to achieve these management measures. Each state plan must include a list of the categories of activities, the list of pollutants that they're looking at, the list of areas that they feel need to be controlled to protect the list of coastal areas that they've identified. This state plan has to have an estimate of the pollution reduction which will be achieved as well as an estimate of the cost. The state plan must include provisions for making site-specific adaptations of the techniques that they list. The state plan has to include monitoring so that they can look and see whether this is actually working. And, the state plan has to map out a second phase where they would not only employ technology-based solutions, best available technology, the greatest degree of reduction achievable, but also a water quality-based approach. That's phase two of this. How are the states, if the best available technology isn't enough, then to go to meeting water quality standards, just like under the Clean Water Act? This is what the Coastal Zone Management Act of 1990 actually does. It's in place. EPA standards by 1992, state plans by 1994, and the hammer is that the states lose their coastal zone management funds and some of their 319 funds in 1996 if they don't have their plans approved and in place.

What they're talking about in the Clean Water Act is something similar, i.e., EPA guidance on what best management practices are for a variety of activities. State implementation programs, the funding hammers that are under consideration, are loss of highway money or USDA grants.

Now let's talk about wetlands. This legislation is not in S1081 because it is expected to be extraordinarily contentious. And whereas the other kinds of legislation that we're looking at under the Clean Water Act, for the most part, are being driven by trying to enhance environmental protection, the wetlands debate is being set by those who want to roll back wetlands protection as a result of the 1989 manual and the memorandum of agreement on sequencing. What's interesting is that prior to the 1989 manual, the regulatory community used to whine all the time about how this agency had this definition, and that agency had that definition. And then they got what they wanted. They got a single definition. And it turns out that that scared them even worse.

This was a definition, notwithstanding Bennett's description, that was widely accepted in the scientific community, that got rave reviews, and was workable because the agencies actually used it. It got rid of some of the inconsistencies and had a scientific basis. What we're now looking at in terms of rollback is something that will have less of a scientific basis. And, there are legislators in Louisiana who are concerned enough about this that, for example, Senator Bennett Johnston has attached language to an unrelated energy and water appropriation bill to try to stop the agencies from using the definition in the enforcement manual until they either go through rule-making or there has been new language adopted as a result of Congressional action.

Anyway, there is a variety of opposition bills. The opposition bills change the definition of wetlands and rank the wetlands so that you don't have to protect all of the wetlands. This is coming out of, in part, an administration which has a "no net loss" policy. The no net loss policy is perceived as dangerous by a variety of people on the coast. As much as we talk about wetlands in this state, and you're going to spend all afternoon tomorrow talking about wetlands, again, remember, this is a debate that is being driven not by what's happening in Colorado, but by what's happening in Louisiana and along the Gulf Coast primarily, as well as what's potentially happening in Alaska.

They're going to rank wetlands, and low value wetlands probably won't need to be protected very much. Middle value wetlands will need some protection. The federal government is going to be forced to pay people who own high value wetlands. They're going to be forced to compensate them under the takings clause of the Constitution. This is a massive buyout for the people who own wetlands, who happen to have property that might be affected. If you own high quality wetlands and these bills pass, you can go to the government and you can say I was going to do XYZ and now maybe I can't because I have high value wetlands, so pay up. That's a provision in these bills which is extraordinary and is unlikely to pass, but it's in there.

These bills would also eliminate the EPA's veto of 404 permits. Two Forks is one of eleven dams in the nation which was the recipient of an EPA veto. Twenty-four dams have entered the process; there have been 150,000 permit applications, but there are apparently a variety of people in this country who think that EPA is overstepping its bounds by having vetoed 11 of 150,000 permit applications. So, they would take EPA out of the process.

At the same time, to counter these bills, you've got an advocacy bill, House Bill 251. This would strengthen EPA's role and would, in terms of 404 permitting, force the Corps to listen to the Fish and

Wildlife Service. Right now under 404 permitting, Fish and Wildlife Service has to give the Corps a report about whether there will be problems or what kind of mitigation is necessary. The Corps gets those reports and routinely puts them in the file and ignores them and doesn't always do what the Fish and Wildlife Service suggests should be done to protect the wetlands. That would be changed if House Bill 251 were passed. This bill would also legislate, would write into law, the definition in the manual and the sequencing in the memorandum of agreement.

The environmentalists would like to go beyond that in two ways. Number one, to put in citizen suit enforcement, and number two, this whole issue about draining land for agriculture. The farming community says, well, once it's drained, it's not a wetland. Of course this is 80% of the lost wetlands in the last twenty years. Once it's drained and it's not a wetlands, it doesn't get any protection. All of the land that's been drained for farming over the course of the last two centuries should be grandfathered in and shouldn't be treated like a wetland. Of course, that makes sense, complete sense. Except that if it stops being farmed land, should it then be built on? One of the things that the environmental community has suggested is that you get grandfathered as long as you are farming and as soon as you stop farming, you lose the exemption.

Real quickly, so that there's time for questions, let me discuss biocriteria and sediment standards, both of which are being handled by the Colorado Water Quality Control Commission. And the Water Quality Control Commission also is going to take up the definition of wetlands for Colorado. Biocriteria and sediment standards are tentatively scheduled, I guess, for next August.

The first sentence of the Clean Water Act, and granted this is a goal and not an enforceable provision, talks about the restoration and maintenance of chemical, physical, and biological integrity of the nation's waters. For the last twenty years we have focused exclusively on chemical integrity. That's what water quality standards are. Water quality standards are lists of numbers for metals and other inorganics and now organic pollutants. That is all we've looked at in this country. We haven't looked at biological integrity. We haven't looked at physical integrity. There is language in section 304A of the existing Clean Water Act which tells EPA to develop biological monitoring and assessments. It's never been done. And, seeing the writing on the wall, EPA came out with a draft guidance document late last year on biological criteria.

Biological criteria, the happy fish test, has a couple of components. It says go out and figure out what a stream should look like and then go and look at your stream and even with all of these permitted discharges you have, look and see whether those fish are happy. And if those fish aren't happy, try to figure out what you can do about it, because, obviously the discharge permits aren't doing enough. It is an addition and a supplement to existing chemical criteria. In the state of Ohio, where both are currently in use, in 60% of the cases, if you've got a chemical violation, you will also have a biocriteria violation. In the other 40%, they diverge. So, in some cases it's a check to see whether the chemical criteria are doing enough, and sometimes it's going to look at other aspects of aquatic community viability.

EPA has told the states that EPA wants to see biocriteria adopted by all states during the next

three years. This puts the states in a difficult position because EPA hasn't done its national criteria. It makes the states legitimately really nervous to have EPA say we want you to do this but we're not going to tell you how.

So, EPA's biocriteria guidance are coming, but they're not out yet. In the meantime, there are people who have raised the questions that since EPA hasn't done this for twenty years, maybe the Clean Water Act doesn't really require EPA to do this. How do we know that EPA really is allowed to do this? Isn't this list of chemicals enough? Because people started raising those kinds of questions, EPA looked around and said, okay, we're going to have Clean Water Act Reauthorization. We'll just make it a little clearer. So section 18 of S1081 has a specific provision which says that EPA is not only allowed to establish biocriteria, it puts EPA on a schedule to establish biocriteria guidance for the states. That's coming. That may seem controversial, but it's likely that that will be written into the Clean Water Act at some point within the next couple of years.

Finally, sediment standards. There are two bills on sediment standards, both S1081 and another bill from Senator Mitchell, S1070. There's a 1987 EPA report out that says every major US water body in the country has moderate to severe sediment contamination. It's from discharges, it's from airborne deposition, it's from non-point sources, or polluted runoff. The constituents of concern are PCB's, DDT. One-quarter of the DDT that was applied in this country prior to the time that it was banned, has turned up in the sediments on the coastal waters on the Great Lakes. Dioxin and a couple of other nasty chemicals, again, most of which are not issues in the state of Colorado, but they are issues on the coast and they are issues in the places which are driving Clean Water Act reauthorization and driving the Clean Water Act debate. The risk comes from the benthic organisms on the bottom of lakes that stir the sediments up as well as from bottom feeding fish and shell fish. It was sediment contamination that resulted in some of the highly publicized shellfish bans the last couple of summers in various parts of the country. Because these toxins can work their way up the food chain, they are considered to be of concern. If you discharge into the water, it may not end up in the water, it may end up in the sediment. But it may end up back in you. There is one very disturbing study out of the Great Lakes region looking at pregnant women who were eating lots of Great Lakes fish. Those women's babies have lower birth weights. They also have a variety of neuro-indicia associated with PCB contamination.

So, this is a real issue. It may not be a real issue in this state, but it's a real issue, and as a result there is going to be a national push to force states to adopt sediment standards. About the only place in this state that I know where sediment are a known issue is in Stanley Lake in Westminster, and that's because of the plutonium in the sediments of those lakes associated with Rocky Flats.

The bills that are out there propose to compile a national inventory to try to figure out where all these contaminated sediments are, develop remediation and clean up programs, set standards for sediments (California has already done this, but it's going to be coming in the rest of the country), phase out open water disposal of contaminated sediments, try to talk to people about aggressive pollution prevention, and establish some kind of funding mechanism to do all of this. And of course, that's the key with any new program. It's not just potentially a financial burden on the regulated community, it's a financial burden

on the government, and the government doesn't have any money right now to devote to these programs. So what they're looking at in all of these things are increasing user fees, and other similar mechanisms.

Reauthorization of the Clean Water Act
Questions and Answers for Melinda Kassen and Bennett Raley

Question: (Inaudible)

Kassen: The question is not whether we adopt biocriteria or not. It's already there with the chemical constituents that dam builders now have to look and see whether they are going to adversely affect the chemical water quality standards in the streams. This is another way it will affect everybody equally. But it's already there and those champions of the prior appropriations system would of course point to the Wallop Amendment section 101G of the Clean Water Act, which forbids state and federal regulators from taking action that would impede the ability to divert water or to develop a water right.

Paul Frohardt: So if maintaining the biological integrity of a water project would dry up the stream, does that mean the Wallop Amendment would prohibit enforcement of biocriteria in that case?

Kassen: Well, the Clean Water Act also says zero discharge, and notwithstanding the example of the Great Lakes, I don't think that we're moving in this country to zero discharge of everything throughout the country, and I don't think that biological criteria, once adopted, are going to prevent all manipulation of the stream. I think what it is designed to do is to figure out what biological integrity means and go ahead and do what we have to do in terms of water development in a way that is as minimally damaging as possible. Antidegradation does not mean no development, ever. It means try to do it without damaging the stream, and if you can't do it without damaging the stream, and it's still important to do, then go ahead and do it, but do it in the least damaging way possible. That's true for chemical integrity. It should also be true for biological integrity and for physical integrity, whatever that means.

Paul Frohardt: OK, Bennett, biological integrity sort of sounds like a good idea, Melinda says it's not going to stop development, why shouldn't we be looking at this as well as how many milligrams per litre of lead there are in a stream? Isn't this another legitimate consideration for the environment?

Raley: I think it clearly is a legitimate consideration, but there is a direct conflict between the two conceptually, in that if you define water quality standards to be the preservation, or enhancement, of the natural environment, unaffected by a diversion, then you can't take the water out of the stream, or you have at some extreme level simply destroyed some of the aquatic habitat. Now, I believe that what may occur is that we won't see water projects halted, nor will there be very many of them that are simply forced to stop storing water. But, I think what will happen will be that all the water projects will be dragged kicking and screaming to the table. They'll have a gun pointed to their head of the theoretical

prohibition of the diversion of storage of water because of this new standard. And then the negotiations will start. How much of your yield do you give up? I think that is what would happen if biological criteria are put in place. And, some would argue that, well, gee, you got 80% of your yield, so you really aren't hurt, and Dr. Laitos has made arguments that said that that is not a taking under the Colorado or the United States' Constitutions. But if you happen to depend on that 20% for drinking or farming, that is gone. It's a complete taking of the water you use, and you do have, potentially, or at least conceptually, direct conflicts. And that's why I identify the issue of who is going to make that decision. The issue is not whether we're going to have some sensitivity or a lot of sensitivity to issues of general environmental health of the resource, but who's going to make that decision? Is it going to be EPA or is it going to be the state acting through the state engineer, the Water Quality Control Commission, and the Water Conservation Board? That is the true issue where I think that we can profitably spend some time because that's open. We will have protection of aquatic resource, but who's going to do the balancing? Do you see my question?

Paul Frohardt: These are very difficult issues to grapple with from both perspectives, and both, each of you have offered some comments which seem quite reasonable. Bennett, you were saying we need to grapple with this issue, find the right forum to grapple with it, and try to move forward. Melinda, you're saying it's really not an agenda-shutting-down development. Unfortunately, it seems that when these issues get played out in the real world, they get played out with much more absolute positions. Do either of you have any suggestions as to how we can further the dialogue in a constructive manner to move these discussions forward without a total nuclear war approach from both sides?

Kassen: I think first of all there's a couple of things that are happening in Colorado, the Northwest Colorado Council of Governments got this QQ initiative going, and there are some people from the COG who are here that are going to talk about that later. That's an attempt at a regional level, at least within the state of Colorado, to grapple with these issues and talk about sharing the burdens of keeping the streams clean and how to go about developing water projects, and making water available at the same time that you protect a resource which is critical to the economy and well-being of the West Slope. That's one way. People talking to each other clearly. It's something that we beat to death. But, you've got to be talking to each other if it's not going to end up being a war.

Raley: My perspective is that if we're going to have a consensus or a balance, even though that may be very painful to achieve, with a lot of screaming and yelling and blood on the floor, that it requires that the decision be made within the existing state forums. I mean the Water Quality Control Commission has a very difficult job of trying to balance the two issues with other state agencies, but we will come out with an answer. The important thing, and I think it's very important to Senator Brown, is that it be a Colorado solution. I mean within a general framework of making sure that we've got water that is safe

to drink, the sort of standards that are necessary for the literal health, safety, and welfare of all citizens within the United States. The Senator would much prefer that this debate over the balancing between the aquatic resource or riparian resource, and water development occur here, at the state level, before commissions and meetings like this. If it occurs here, I think we will have an answer that will have some semblance of a consensus. If it occurs in Washington, it is done by EPA. As Melinda aptly pointed out, we don't count. We will not have that sort of balancing of our localized, regionalized issues. I think you will see the lines drawn and much less productive debate will take place. It's just that the national agenda, and EPA's national agenda, when combined with agendas of those like Congressman Miller, simply don't take into account the sense of need in Colorado for management and development of the water resource.

Kassen: And I suppose the follow-up to that is if the states want to keep the program, the states have got to make some real progress. One of the reasons that you have 319 added in 1987, and that you're going to go another step further in this next reauthorization is that the states have got these voluntary programs and they're saying, look, it's enough. And yet you look around the country and we're not cleaning up non-point sources. For the states to keep control of non-point source programs, the states are going to have to make real progress, which may mean you can't survive simply with a voluntary program. You're going to have to go after the real sources, which in this state are agricultural runoff and mining, and you're going to have to implement a program which actually makes some difference. Because, what's happening on the Hill is they're responding to the fact that it doesn't seem like anybody's made any progress on non-point sources over the last two decades.

Raley: Let me just qualify that a little bit. Talking to the staffers on the House side, their perception, and they're drafting right now, by the way, I think we will see that Melinda was confirming some rumors that she had heard. We will see a product out of the House committee some time after the August recess. And, when I talked to them last November, they were a little unsure as to whether or not it was the right time yet to yank the 319 program away from the states because by the time it got up and running, in 1987 (and it took over a year for EPA to do the guidance on 319), the states hadn't had much opportunity to do anything. They haven't had any money as a practical matter, and I heard back on the Hill some sense that the jury's still out on how successful the states have been. And there is not a conclusion that it's been a failure, it's only been watched closely.

Paul Frohardt: O.K. Questions from the audience.

Question: The Cuyahoga River did catch fire and three sources were found to have really messed up the shoreline. There were estimates at the time that the river would not recover for 500 years or more. However, it turned out that no measurements were made any further into the lake than 10 miles from the shore. No one recognized that the lake has three separate bays and each of those bays is different. The

upshot is that we really didn't know how bad we'd poisoned Lake Erie for many years and I suspect we don't know yet. At any rate, the question to the whole panel is, in your opinion, how much overkill is going on in Washington at any level to try to draft laws to protect us from poisonous criteria that have not been developed yet? I'm assuming that as little as ten years ago when I looked for federal standards for purer water, I couldn't find such. They didn't know how much phosphorus or how much of heavy metals or how much of anything else could be in water and still be safe for drinking. It seems to me as I listen to you that all these laws are being written before we even establish the scientific criteria to determine whether those laws are needed. What's your opinion?

Raley: Well, I think it's pretty clear that that's the approach, and the justification would be that since there is a risk (this isn't my point of view) out there, and we can't quantify it without more information, better science, and more data, we need to hold the status quo so that we don't wake up ten years down the road and find ourselves unable to recover what has been lost in the ensuing ten years. That's the justification for the pretty aggressive programs to freeze or even enhance existing levels and protect us from risk. But, more broadly, you're raising a question that surfaces periodically in the environmental context, and I think will more in the future, and that is simply one of risk assessment. If there is a one in ten thousand risk that you're going to develop cancer, if you're the one in ten thousand, obviously, it's very important. I don't mean to belittle that. But society has a limited amount of money, the government has a limited amount of money, and every protection that you put in place, every form of insurance has a corresponding cost. How much insurance can we as a society afford? And this notion of risk assessment, which EPA is addressing, I think they've got some risk assessment documents that are out, and their vision of that is in part driving some of the Clean Water Act Reauthorization. This is a difficult issue because it boils down to a very personal one for people.

Kassen: I think risk assessment is clearly the name of the game for the future. It's going to be a part of Clean Water Act Reauthorization because of the toxics issues. It's going to be more of a part of RCRA Reauthorization. Is it overkill? I think part of what you see is the fact that we don't know exactly what we're doing. When you listen to these statistics, we've lost half of the wetlands that this country had 200 years ago. It is known that wetlands provide flood control, they serve as water purifying mechanisms, they serve as habitat for a whole variety of species. Can we afford to lose another half? Can we afford to lose another 10%? Where is the critical point at which we've lost too much, and we've lost a necessary part in the ecosystem? So that you see Congress looking at these statistics, listening to the scientists who know some things but don't know other things and saying, maybe it's the conservative approach to try to make sure that there's no net loss. So they're responding to the fact that the world's changing real fast, and we've done a lot of damage and maybe we should try not to do quite so much damage in the next couple of decades while we figure out whether it's ok to lose another 50% of the wetlands in this country.

Question: My name's J.R. Nuckols and I'm with Colorado State University. I am a water scientist. My first point addresses the biologically based water pollution control criteria. An analogy shows why biologically based water pollution criteria are important. Let's consider your body. And the only measure of your health is what you drank on one day every three months. If you went in and had analyzed what you took into your body once every three months, and that day you did carrot juice and did all the right things you're supposed to do and the rest of the time you do nothing but guzzle coffee and smoke cigarettes, the indication from chemical testing would be this guy's in perfect health, his body's in perfect health. Whereas if someone was able to analyze the organs in your body when you came in every three months, their organs would reflect what you really did for the rest of the time. This is the scientific reason why biological measurement is important. Because you can tell from the biology in the stream whether or not it has been impacted between the times that the chemicals have been analyzed. Biology of the stream tells you what's going on in that stream and gives you some ideas about how to treat the water to achieve the goals. The goal is to maintain the biological integrity of the stream. That's what we're trying to do in the Clean Water Act.

These ideas are not some kind of surprise attack from the EPA, just as the best management practices, the studies on urban areas in terms of non-point source pollution were funded back in the seventies. We recognize that when the Clean Water Act was incorporated from science teams, that non-point source pollution was a big problem. We didn't go into the magnitude of it, but we knew that it was a significant problem. The Clean Water Act funded studies to see what this problem was, and said, in the meantime, states, try to do the best you can to get a handle on best management practices. I think your same concern with hydrological consequences is that this biological criteria is going to cause havoc.

I would suggest to you, sir, that Senator Brown and Senator Wirth get together and say let's go for some line item funding to incorporate research into what are the biological consequences of discharges and diversions. How long will it take? What can we do to mitigate the damage? I think if we did that, that would be in keeping with the Colorado Water Conservation Board's instream flow program, which is based on preservation of the natural environment to a reasonable degree. What is a reasonable degree? That type of research needs to be done. Perhaps this is an opportunity to get the federal funding in order to do that research.

It sounds like Melinda and myself have had twenty years of experience with the Clean Water Act, and I think that it's a good act from a science standpoint, in that it is goal-oriented, though the goals are sometimes considered outlandish for non-point or zero pollution discharge. But the idea was to try to incorporate methods and research to achieve those goals over a long period of time, while openly saying we're going to enforce this if you don't. Don't you think it's time that Colorado started recognizing that water quantity can no longer be the shining star, that the quality issues are important? We need to address them, and if we want to maintain our states' rights, if that's our goal, it's time for us to jump on board and to get into the arena of trying to do the research and background information so we would not have to have the federal people forcing us to do that.

Raley: Clearly, water quality and water quantity can't be separated. And they are both important. You need to have enough water and it has to be of a sufficient quality for you to use it. There's just no question about that, and Colorado has been struggling with a system that allocates responsibility for resolving those conflicts in separate arenas. And that's the source of a lot of conflict. It all struggles through on a daily basis. I am not a scientist, but it intuitively sounds right to me that the use of the biological criteria concept is legitimate to test whether or not that stream system is the same as it would have been if man had not appeared. I do not disagree with that. The issue is that the Clean Water Act has been supported very broadly in this nation primarily because it was viewed as something necessary to clean up those toxics, the poisons, and all that sort of stuff. People could relate very easily to the Cuyahoga River's setting on fire, and they certainly want clean water to drink, and they don't want rivers that are nothing but open sewers. However, shifting the Clean Water Act to an act that is not clean water but an ecological protection act, which is what I think the outcome of biological criteria is, is not something that has been fully debated.

Now, I'm not saying that that isn't where we will decide to go as a society, I'm just saying that that issue, given that we don't have a perfect world and unlimited dollars to throw at these technical problems, that's an issue that has not been resolved, and there are some hard choices that I would point to just conceptually. Sure, we'd all like to have perfect natural streams in our backyards and everywhere they exist. But that's physically impossible unless we all want to move to another climate. And so we inherently have to make some trade-offs and that's where the balancing occurs. Coming back to the point I made earlier, who makes those trade-offs? The issue is not whether we protect the aquatic environment, the issue is who makes the trade-offs and whether that's done at the state level or at the federal level.

Question: Is there any type of happy people test, because we really are the endangered species?

Kassen: I think I disagree with your premise. We're losing twenty thousand species a year, if you count the plants and the animals and the rain forests as well. I don't see us losing a lot of folks at that level. There's more people now than there have ever been.

Audience member: There's only one of us species.

Kassen: And that's probably a good thing.

Raley: I certainly couldn't top that one.

**Integrating Environmental Values Into Western Water Law and Policy:
Minor Adjustments or Major Reform?**

Greg Hobbs, Attorney, Davis, Graham, and Stubbs

Marc Reisner, Author, Cadillac Desert

Moderator: Larry McDonald, Natural Resources Law Center, University of Colorado

Paul Frohardt: Larry McDonald will moderate this debate. Larry is the director of the Natural Resources Law Center at the University of Colorado. The two debaters are familiar to most of the people here. Marc Reisner, author of Cadillac Desert as well as a book called Overtapped Oasis, and I understand a new book that's just come out called Game Wars, having to do with wildlife poachers. He's a writer, lecturer, and consultant who previously worked for the Natural Resources Defense Council for a number of years. Greg Hobbs is a partner at the Denver law firm of Davis, Graham, and Stubbs. He's the principal counsel for the Northern Colorado Water Conservancy District. In his jaded past he worked both at EPA and in the Colorado Attorney General's office. He spent a number of years on the Colorado Air Quality Control Commission, including serving as Vice-Chairman of that commission, and he's currently co-chair of the National Water Resources Association Task Force on the Clean Water Act Reauthorization. I'll turn it over to Larry.

McDonald: The format of the debate this morning will be as follows: we will begin with Greg Hobbs. He will have a ten minute presentation. We will follow with a ten minute presentation by Marc Reisner. Then each will have a five minute rejoinder period. Then we will move into a series of questions and open it up for your participation. We have about an hour and fifteen minutes to do all this. It will be an excellent opportunity to hear from two leading people in this area. So let me then first turn this over to Greg Hobbs.

Greg Hobbs: Morning. Thanks for your invitation. It's good to see Marc up here on the podium. I've had the opportunity to read his books a couple of times, including Cadillac Desert. How many have read Cadillac Desert here? As you know, immediately following Cadillac Desert there was a spate of water books, and many articles, including a recent Time magazine article. I think most of you have probably seen that. Marc ghostwrote that for the Time editors. It's really too bad that he doesn't get a byline on this.

I've spent the past four days in California, and as usual, California's a real eye opener. Marc also ghostwrote a piece for the San Diego newspaper, the Sunday paper, published yesterday, on water marketing. Everywhere you go, if Marc Reisner isn't quoted, there is at least something from books he's authored that some newspaper writer has quoted. One of the sad happenings for that dwindling part of community which still believes in the power of appropriation doctrine, is that the national press, especially, does not quote folks who appear on the other sides of these issues. If you think I'm being

facetious, during preparation of the Time magazine article, a number of water-user organizations were interviewed, including the Northern Colorado Water Conservancy District, through Mr. Simpson and me. There's not a trace of balanced presentation in the Time magazine article, in my opinion. The theme is that the whole of the Colorado River is trashed. There's no hope for it. It's the most degraded river in the United States. Why is it that at the time that the Upper Basin States think about using their compact entitlement, the most threatened river in the United States is suddenly the Colorado? It seems to me, coming from this side of the table, that there is a highly orchestrated public opinion piece by law reform writers going on. The national media always has to have a hook on the story. Now I don't want to insult anybody here, so I will start with my standard disclaimer. Anyone who feels insulted can leave.

I appreciate the forum, though, because it is a chance to debate the issues. There is no way to command the media's attention unless there's some environmental disaster. And the "environmental disaster" going on right now happens to be "the degraded rivers of the West." Well, as a matter of fact, little is said about this "degraded river," the Colorado, serving 20 million people and an incredible agricultural, municipal, and recreational industry. Sure, there have been alterations of the natural flow, but those alterations have not completely degraded the environment. Sure, there's regulation and re-regulation of streams. If there hadn't been, I don't think we would have won World War II. The industrial strength of the United States was built in large part on the rivers of America. Now, in guilt and anguish we think back on the romantic poets of the nineteenth century: man, the Noble savage, Moby Dick versus the harpoon man. You know, the suffering soul, the human soul, that part of us which dislikes what we have done to the environment always bubbles forth, and we have classic schizophrenia. Maybe it's not schizophrenia, maybe it's the sides of our soul working together, of conservation of natural resources versus preservation.

As Congress proceeds into the Clean Water Act Reauthorization, there's not a doubt in my mind that the environmentalist agenda is to have a national water law at long last. Starting in 1866 with the Mining Act, Congress determined that water law would be made according to the custom and law of the States and territories by those who inhabited the West. Our public land policy was to open up the West. Water, of course, was an incredibly valuable resource for accomplishing the national purpose. The most flexible water doctrine known to man is the prior appropriation doctrine, and it has continued to adapt. Its guiding principle is beneficial use without waste, addressing whatever values society wants to address in terms of its laws and customs. Left to the States, each State reflects in its water law, its own view of the public interest. It should not be surprising that the public interest originally reflected settlement of the West, agriculture, mining, the cities. We developed the economy well enough to have leisure, the basis of culture, recreation became very important.

Very little attention, in my opinion, has been given to the value of reservoirs and water storage for recreational uses. We would certainly not have the Summit County ski and recreational development if there were a wilderness area with bankful reserved water rights, sitting where Green Mountain Reservoir is now. If the Sierra Club had bankful reserved water rights sitting where Green Mountain Reservoir was authorized in 1935 by Congress, instead of what happened, the ski area couldn't take water

out of the stream for snowmaking. The incredible recreational economy of the Western Slope would not exist without storage and releases from Green Mountain Reservoir and Ruedi Reservoir.

The great trophy trout fisheries in the West are below reservoirs. Let's look at the Arkansas River. What happened when the Bureau of Reclamation and the rafting community decided, in connection with the State of Colorado and the Southeast Water Conservancy District, that they wanted the run of recreational water out of Twin Lakes? The natural hydrograph falls off during the summer in Colorado. Streams dry up in Colorado and throughout the West during the summer, July, August, and September. So when a river run is all set up for the rafters from reservoir water, who screams? The trout fishermen! That great fighter against new reservoir projects, Trout Unlimited. What does T.U. really like? Regulated stream flows from smaller reservoir releases for the fish. Reservoir stream runs for recreation and fish are in conflict. Conflicts abound.

Where will the water marketing proposals that Marc writes so eloquently about come from? They're going to come from those great public works storage projects our ancestors built on the rivers of the West. You can't have year round water use for municipal, agriculture, and recreational use without storing water. Water is stored in times of high flows and reregulated into the streams. Of course, that's basic. Think Time magazine can talk about that? Oh no. You think Time magazine read the salinity report, the 1990 Colorado River report of the Salinity Forum? There has never been an exceedence of the standards set on the Colorado River for salinity. Not one! You remember the agreement of the seven western states? Average salinity levels would be maintained on the river at 1972 levels, while water development under the 1922 and 1948 compacts would continue. Please read the 1990 report of the Colorado Salinity Forum. There have been no violations of the salinity standards on the Colorado River, yet what's reported and written in the books: "salinity, salinity, Kesterson, salinity, salinity, Kesterson, Kesterson, salinity, salinity." It all blends together and the folks in New York City who believe that the West is populated by savages anyway, have their view of the degraded West and its environment.

Look at the facts. The fact is that our water quality is getting better, not worse. Under the 1972 Federal Water Pollution Control Act, we have in every western state, the permitting of point sources and we have non-point source control best management practices, including through the salinity forum. California, that's where environmental problems are occurring, the railroad disaster, herbicides spilled into the stream. The carrying of hazardous wastes, the spilling of toxins, this kind of thing is a true environmental problem. Our water development projects return water to the rivers. Rivers that were dry historically now have return flows in them providing habitat for abundant wildlife and wetlands. For example, at Riverside Reservoir where the white pelicans feed and nest. Never existed before, Riverside Reservoir, now a waterfowl sanctuary. So I say that to those who want to dismantle the prior appropriation doctrine, we've got to watch what you want to do. You cry about the poor little lambs and mean to swallow them whole.

Marc Reisner: Well that was a forceful speech. I don't know where you all are staying, but my motel parking lot was full of cars from California, and it seems to be they had the showers running all night

long.

You've just heard remarks by Greg accusing me of wanting to abolish appropriative rights doctrine. You know, I have a lawyer friend who had this kind of response, too. He'd go out by a road, pitch a tent and wait for the ambulance to come by. Greg is really falsely accusing me of wanting to get rid of appropriative rights doctrine. What I would like to do is encourage more people to think about adjusting the appropriative rights doctrine. I think it is in serious need of reform, and not just minor reform but major reform.

What's wrong with it? Several things. Appropriative rights doctrine really grew out of the gold mining episode in California. That's where it first grew up. And from the get-go, appropriative rights doctrine created an environmental calamity by default, or accidentally if you will. And that was the placer mining epidemic, that's really what it was. For ten years these miners who had rights to river flows and could do anything beneficial and useful with those flows, ended up putting them into placer hoses and taking whole mountainsides down. The result of that was that San Francisco Bay is about seven feet shallower than it used to be. Lake Sidney's shallower, and the whole riparian ecology was more or less destroyed. Sacramento flooded. It was actually the farmers of California who launched the most bitter protest against this kind of reckless application of a doctrine that in theory I think makes sense, and I think most people do. It has created in the West a kind of oligarchy of the earlier appropriators who got the most senior and the best water rights, and now also of the rich, who can buy those water rights in states where you have water marketing. The water users who get left out are often not people. They're animals, they're wildlife, they're fisheries, and they're people who depend on those for a livelihood. Also, those in the recreation industry who depend on flows for rafting and for fisheries. And as Greg said, some of these dams have actually created fish flows in dry rivers, and nowhere more so than California.

Beneficial use, I think, is the watchword of appropriative rights doctrine, and until very recently, beneficial use essentially meant this: you take water out of a river, and irrigate land with it, or you take it, divert it through an aqueduct to a city, and grow skyscrapers on it. But you can't leave it in the river. That's not a beneficial use. Even if you own the water rights, and you want to just leave the water in there for the fishery, that's not a beneficial use of water. Until very recently, in almost every western state, I think that's essentially what beneficial use meant.

Now, you know, things are beginning to change. We have instream flow laws in most of the states, certainly in Colorado there's a big map out there that shows you all the rivers that are registered. The question I have is how meaningful are these reforms? How flexible is appropriative rights doctrine in dealing with not just some environmental catastrophes, which we'll talk about in a minute, that are in the making, but also with changing values in society, changing economies. You know, what's the answer? Things vary from state to state.

In Colorado, you don't have the situation we have in California, or that they have in the Pacific Northwest. But what appropriative rights doctrine has done in California is this, it has in effect built 1400 major dams. And those dams have dried up 96% of the wetlands in the Sacramento and San

Joaquin Valleys. As a result, waterfowl populations that may have been a hundred million at the turn of the century, were down to 40 million by World War II, and are now down to 2 million. Because there's just no habitat left. The salmon in the Sacramento River, the winter run salmon, in the last twenty years have declined from 140,000 fish to about 250 this year. The spring run, these were the big 60 and 70 pound salmon that used to go up through class five rapids and spawn at five thousand feet, these are down from about 40,000 to 2,000. The winter run should certainly be a federal endangered species. You know that when a species gets listed, it often has much more to do with politics than its endangerment, so the species is now listed as threatened federally, and endangered by the state. It's very likely that that run will go extinct, especially with the drought continuing.

Now, it isn't just the fault of appropriative rights doctrine; it's the fault of the Bureau of Reclamation, which insists that the Central Valley Project was not created to do anything for fish and wildlife. And, in fact, legally, they're probably right. But even out of the goodness of their heart, they really haven't done much of anything for these fish.

What I think Greg, and people like Greg, fail to recognize is that all of this water development that we've performed in the West, and which has, I acknowledge, created a lot of good (I wouldn't live in San Francisco if it weren't for a big underground aqueduct called the Hetch Hetchy System, the only one that has robbed a national park of its water), was what lawyers would call a taking, or ought to be called a taking. A taking of resources, first from the public trust, and secondly from nature itself, and perhaps most importantly from people, from industries that depended on fisheries, on waterfowl.

You go up and down the coast of California today and you see ships for sale, fishing boats. You see despair, like you just don't see it anywhere else, even in the San Joaquin Valley where there's 40% unemployment because of the freeze and the drought. You see alcoholism, you know, family abuse, I mean it's just a human disaster out there, and that's because the salmon runs, which had a very good year in 1988 because of the big flood we had in 1986, have essentially gone from a million two hundred thousand fish down to about a hundred thousand this year. And salmon is the cash cow for the fishermen off the coast. It's the only fish that really commands big bucks.

Nobody has offered any restitution to these fishermen, and it's not entirely the fault of dams, but it's largely the fault of dams and the way they're operated. Every year of this bad drought we've had, from '86 to '90, all the irrigators who get water from the federal and state projects, got 100% of their water allocations, every single year, even as the drought got worse, and the fishermen essentially were left with nothing. So the fish went downhill. What we need to do is first of all, think of the environmental harm that's been caused. Obviously, that's been thought about, it's being written about, I don't think it's a red herring issue, I think it's a very, very significant one, especially since more and more people value the environment. That's just a fact of life.

Whether Greg likes it or not, most Americans now think of themselves as environmentalists. And environmentalism means wild fisheries, not hatchery fisheries. You know it means free-flowing rivers, not reservoirs for the most part, even if those reservoirs sometimes keep the rivers free-flowing. I'm not saying tear them down; what I'm suggesting in the various talks I give and writing that I do is essentially

this: We need water marketing because we can't stop growth. At least in a democracy, we can't stop urban growth. The alternative to water marketing is dams, like Two Forks. I don't think we need any more dams. I think we've built plenty. What we need, though, is a system of water marketing that does minimal harm to rural areas like here, and that is somehow linked with some kind of effort, at least, to control growth.

Now, you know, the farmers in California are right. They're being asked, in a sense, to become the new source of water for Los Angeles, which is growing by 450,000 people per year and which doesn't seem to be doing anything to control that growth. Well I think that's largely because it can't, anymore than Denver. Now Aurora, you know, on the other had, seems to want growth. They seem to want to become a city of a million people. It would be nice if at least they didn't talk as if they wanted to become that big. But since half the people in Los Angeles who are added to the population every year are born there, I think talking about stopping growth is really a straw man.

So what Sarah Bates and I proposed in Overtapped Oasis was that there be a system of water marketing, which we don't have in California. I know you have it here, but we don't have water marketing in California. It's basically illegal for various reasons. We need a system where cities looking for water first have to go out and install state-of-the-art irrigation and help farmers conserve water any way they can. Secondly, arrange leases during drought years. That way you don't have permanent rights being bought away from areas. Thirdly, and only as a last resort, start negotiating for permanent water rights. I think that's the system of least impact, and there isn't a single state that's really adopted it yet.

I think you should limit the amount of water that can go out of a region. There's a bill in California now that makes water marketing legal, but it prevents more than 20% or I think 25% of the water in any agricultural water district from being sold. That's the capper. And if L.A. takes 25% or buys 25% away from the current county water agency, it has to go some place else to look for more. I think that's a good law.

Public trust doctrine, I think, whether Greg likes it or not, is a happening thing. It's going to exert a tremendous amount of influence. Look at the results. We have a Columbia River fishery that's down from 16 million to about a million and a half fish. We have, as I said, 96% of the wetlands gone in California. We can't just release enough water into the rivers so that the fish barely manages to stay off the endangered species list. Or say we get 1% of our wetlands back. To me that is not enough. We have got to do more. There's an honorable American tradition called restitution, which in the water development arena has simply not been honored, and I think it's time we did.

Greg Hobbs: There's also an honored American tradition called stealing. Stealing water has been one of the most honored traditions. I find this interesting, this whole debate about water marketing being salvation. Marc has written an excellent book with Sarah Bates, Overtapped Oasis. There are a lot of thoughtful comments in it. One is the dilemma that environmental activists like to promote water marketing to avoid new dams, yet keeping water in the basin for return flows helps instream flow values and wetlands which reservoirs have created, artificially perhaps, but created nonetheless, out of irrigation

return flows for example. The world is not that simple. It would be easy to paint me as anti-environmentalist; if you'd like to believe that, fine.

Let's don't think we can strip our agricultural community of its water and have good public policy for the Nation. A Seattle newspaper article, here it is, reports: "We're Running Out of Water". Californians, 26 million of them (California gained what, 4 to 6 million people in the '80s, while the rest of us were standing pat), have a water crisis. No wonder! They're looking to us and the farming community to solve it. Some of those Californians move to Seattle only to read: "We're Running Out of Water." You know what the water crisis is? Adequate distribution and storage for the growing Seattle/Tacoma area is lacking. That's a crisis.

San Diego's got a problem. Water marketing is now their salvation. This newspaper article appeared yesterday in the Sunday San Diego paper: "Water Marketing is Gonna Solve Our Problem." Is water marketing going to solve the problems for those whose agriculture/economic bases are being dried up?

Look at the benefits and impacts in Colorado. Weld County. Since the Colorado-Big Thompson project came on line, it's been among the top three agriculture-producing counties in the entire United States. Eight hundred sixty-four million dollars in agricultural products out of Weld County alone in 1988. In Marc Reisner's own California, the agricultural industry contributes 10% to the State's Gross Product. That Gross Product is bigger than most of the nations in the entire world: 70 billion dollars worth produced by California agriculture. Is that the base we want to dry up?

I question the premise that Marc argues, that we don't need new dams and reservoirs. We ought to be conserving water in times of high water flows; we know these happen cyclically. To make agriculture water available for year round use by cities, we have to have storage above the cities. An agriculture water right is historically used only during the summer. When you change that water right, you must store the water above the cities to make the water available for year round use. You can't avoid building dams and reservoirs if you want to move agricultural water off the land. Doing without storage is a myth. It's a myth.

Let's not forget the traditional underpinnings of the American Progressive Conservation Movement. When there are water surpluses, you can plan for dry years, for releases into the stream, for aquatic life, for recreation in times when you could not otherwise have it and still serve the populus with drinking water. Maybe additional storage can take place off main channels. Maybe projects can be smaller. But we can't do without storage. I spent two days on Santa Catalina Island recently; the tour bus operator kept talking about the reservoirs that water the wildlife. How critically low they were.

The Mayans had a whole system of reservoirs. I've attached a map of Tikal to the paper I prepared along with this debate. Tikal grew to an advanced civilization over the course of 1500 years, a city surrounded by twelve reservoirs, by causeways which were pathways into the great city, serving also as aqueducts leading to the reservoirs. Irrigation and water storage is the custom of the Americas and ought to be respected.

Marc Reisner: What Greg doesn't mention about a lot of these civilizations that grew up on water development is that most of them died. Well, where would you build a dam, Greg? You obviously want to build some dams. Where in Colorado would you do it? You know, I think the fact that we have to recognize is that the dam sites are gone. And I spoke with Bureau of Reclamation engineers when I wrote, Cadillac Desert, and they said, oh, yeah, the dam sites were gone by the '40's, the good ones. We were being forced by Congress to build dams that we didn't want to build. I heard that from Floyd Dominy himself. People like Wayne Aspinall wanted more dams built, especially up here.

The reason we build dams any more is because we have this cash cow called the U.S. Treasury which all of us hate because it runs up deficits but which all of us love because 95% of us depend on it for subsidies of some kind. So, to paraphrase Greg, anybody I insult can leave. I see some cattle ranchers in this audience. I think it's certainly open to question whether cattle ranching in the West can survive without subsidy. You've got subsidized water in many cases, you've got subsidized grazing permits, if you're raising milk cows, you're getting subsidized milk programs, you've got subsidized fencing on the public lands, you've got subsidized set-aside and conservation programs, all of which allows you to go out and vote for a Republican, you know, who accuses his opponent of being a Socialist.

One of the things we might think about doing is phasing out or phasing down some of these subsidies. Let me give you an example. I hate to keep talking about California, but that 70 billion dollar agricultural industry, by the way, is not really a 70 billion dollar industry; in gross value it's about 18 billion. The average free-lance writer, you know, makes about six thousand dollars a year, but he spends about seven thousand dollars a year on coffee, or booze for that matter. That's called the secondary effect. So if you want to include all the secondary effects, you somehow could work it up to 70 billion. That's what the agricultural people say. But the gross value according to the state is 18 billion. Yesterday it was a 765 billion, today probably a 785 billion dollar economy.

Agriculture uses about 80% of all the water in California, as it does up here, as it does in every western state, and it grows wonderful food, wonderful grapes, wonderful wine, a very valuable industry. However, of that 80%, about 28 million acre feet of water that agriculture alone uses, that's four times as much water as there is in the state of Colorado, about 35 or 40% grows four crops, which are rice, cotton, irrigated pasture, and irrigated alfalfa. Now those are all low-value crops, compared to most of the other crops grown in California. They're all highly water consumptive. You put eight feet of water on a pasture in California, and evapotranspiration is four, so you have a consumptive use by pasture alone of about, I think, 4.1 million acre feet of water. Now that in an urban setting is water for about 40 million people. And it's now being used to grow grass, for cows. Now my answer is to take the cows and move them to Beverly Hills, and let them grow on that grass, but nobody listens to me.

The reason we have so much grass grown, now this is a million acres in California, is because of subsidized water. We do have riparian owners who can just suck out whatever they want and irrigate their pastures, fine. But our tax dollars are supporting a lot of this agriculture which I think is marginally useful. Now you can take that same water, take a thousand acre feet of water that's used to grow grass, and ship it to L.A., and you'll get about a thousand times more economic benefit, than you would leaving

it in grass. You'll employ 3300 people, in L.A., on a thousand acre feet of water as opposed to about 8 people in the agricultural industry. This isn't to say that I believe we should let L.A. grow to 60 or 80 billion or whatever it's headed toward, or to say that agriculture is expendable. I certainly don't believe that. But we have to look at what kind of agriculture we're encouraging with subsidies. What is the impact of continuing to encourage that?

If the impact is that we're going to build Auburn Dam or that we're going to enlarge Shasta, which is the latest gleam in the dam builders' eye, which would completely inundate that beautiful river that Greg talked about that we just poisoned, would back the reservoir up another forty-five miles. If that's the alternative, I say we need water marketing. I say we need fewer subsidies to discourage so much pasture, so much alfalfa, or so much rice which gets two subsidies at once. Not to put it out of business, but to phase back some of the land. And, you know, if the land is in business because of taxpayer subsidy, then I think you can certainly invoke the public trust doctrine, because the water that raises those crops, does not belong to the people who use it. It's borrowed. It's borrowed from the public at large, and that's the essence of the appropriative rights doctrine. We can ask for it back if we don't think it's serving the public, or the commonweal, in the best sense. And I think it's time we did.

McDonald: All right. Well, I think that's an excellent start to give us some different perspectives on this. What we'd like to do now, is to have a series of questions that the two can respond to, that we'll start with up here, and then we'll open it up for questions from the audience at large. Marc, let me start with you. There has been, I think, a tendency on the part of those who have demanded more environmental protection related to the water resource values, to put forward the concerns about the environment itself, with the result that a lot of people have said that the people with this perspective essentially favor fish over people. How do you respond to that question or that perspective?

Marc Reisner: Well, that's an easy sort of flog a dead horse argument. The fact is, fish and people are interrelated. So I talked about the fishing industry in California. In the Columbia Basin, the fishing industry is a major, major part of the economy. That was the biggest salmon river, in the entire world, which has now been supplanted by the Frazier, and the Spokane, and those rivers up north. But there used to be at least 15 million salmon, and some of those salmon weighed 80 or 90 pounds. So there was an enormous fishing industry going in the '30's and '40's which was clobbered by all those dams. The people who were really hurt were the fishermen, just as they are in California.

Now, what I'm talking about with water marketing, is not taking water, but buying it, buying it for a lot of money. As farmers are getting in Greg's Northern Colorado Water Conservancy District. They are making big money selling water rights. Not taking it all, taking some of it. Or I should say buying some of it. The word take should be expunged from the language. And so I don't see how people really lose.

Now, something like what happened in the Arkansas Valley, to my mind, shouldn't be allowed to happen. You shouldn't be allowed to completely destroy a community-based agricultural valley the way

that has happened there. Agricultural land has been reduced from 70,000 acres down to 5,000. Richard Katz's law in California would put a limit on the amount of diversion that you could buy from an agricultural region. But I think this fish versus people argument is an easy one, and it's emotional, but the fact is, if we only think about people, then the planet isn't worth living on. We have to think about nature to some degree, or who the hell wants to live here.

McDonald: Greg, you want to take that?

Greg Hobbs: When Granby Reservoir was built by the Northern District and the United States of America, there was a fish flow release starting in the mid-'30's. Fish and people are not incompatible. A lot of our constituents in our municipalities and water districts that we serve are fishermen and boaters. We've been recognizing those values for some time. I don't think we get credit for that. The State of Colorado has had an instream flow law since 1973. This has happened in what is called a "pure" prior appropriations State. This ought to tell us how flexible and adaptable the prior appropriation doctrine really is and what can be done without the public trust doctrine being imposed.

I'm glad you've expunged "take" from the dictionary. This term "trust" has a lot better sound to it, doesn't it? When it rolls off Marc's tongue as "trust," what he's really talking about is the water developed by seniors that somehow should be "trusted" over to the juniors. And these juniors are those who, without paying, will receive the benefits of a "trust." Come on now, let's be candid with each other. What's going on here is a taking by the public for values being pushed in such a way that valuable, private interests pay the bill.

Now, I would agree that the public itself needs to invest in senior water rights in order to retire them to instream flow use, rather than legerdemained away by application of the public trust or the Clean Water Act. In fact, the 1986 Colorado instream flow law amendment was made so that senior water rights could be purchased, acquired, donated to the Colorado Water Conservation Board, anybody putting up the money, retiring senior rights in critical stream stretches to maintain instream flow values. I was interested in your book, where you doubted the wisdom of allowing private instream flow rights. I think you said that. Or was I reading somebody else?

Marc Reisner: Well, why pay for it if you can get it for free?

Greg Hobbs: Right. Marc, my point is this. If you like the market, let's make the market work, and let's make the value be paid to those who no longer want to irrigate. I was interested in a published interview you had. You pointed out (it's wonderful, how we all become environmentalists when we need to) the rice growers are arguing that the great wetlands left in California are their rice paddies. And to dry them up, as you've proposed, to move to San Diego, would be to remove the last vestiges of the duck population. Do I understand you on this?

Marc Reisner: No, they're right. I am actually working with the Nature Conservancy and the rice growers to try to save some of that acreage. It is de facto wetlands. And in fact, you know, your ponds out there in the conservancy district are de facto wetlands. And they do support quite substantial populations of Canada geese now, in fact I saw some Canada geese chase a Bureau of Reclamation engineer right across the lawn of the Bureau's headquarters once. They almost bit him. So, I'm not saying no good comes out of water development, but I'm saying where there has been extreme material harm, that's where the restitution has to be made. Now there may not be many instances in Colorado where you can point to that, but you certainly can along the coast because of the salmon. And because of the Pacific flyways which are so important.

McDonald: Greg, let me ask you a question. Marc has raised the point that the water is considered a public resource, that we allocate rights to the use of that resource through our water rights system. Would you say that there is a duty on the part of those that hold the water rights to use that water in an environmentally protective manner?

Greg Hobbs: Let me respond in this fashion. I believe that the prior appropriation doctrine has always involved the notion of beneficial use without waste. And it involves the use of efficient means of diversion. It involves the concept of usufruct. The fruit of the public resource. Under Colorado Water Law, we can impound and release water from impounded storage, for recreation. However, the Water Conservation Board must make the instream flow appropriation. We left that to the State because we're skeptical about whether private entities would really have the public resource and its multiple, optimum use in mind. Private interests might want to command the flow of the stream down to the state line, in the name of instream flows, so we have assigned to a public policy body the balance of the interest in making appropriations without a diversion.

My point is that we do have a duty, as water users, to apply water and use water in an environmentally sound fashion to the degree that we're not wasting water. However, under our State constitution, and many of the state constitutions of the West, if we use water beneficially without waste, we have obtained a private property right. Such property rights under Colorado law can be bought and sold ever since a Supreme Court opinion in the late 1980's or early 1990's involving the city of Colorado Springs. Whether you could convert, on a willing buyer and seller basis, an agriculture water right to municipal use has long been settled in Colorado. This is another example of public policy and public and private values working themselves out. The prior appropriation doctrine has a tried and true aspect to it.

Marc Reisner: Well, that private property right is complicated in the case of federal water from the Bureau or even from the Corps of Engineers, because the private property right exists because of taxpayer subsidy. Now to my knowledge nobody denies that federal water is subsidized water, and people who get it say it is an investment in our future, which it may be. But it is a fact that the Central Valley

Project sells water for three bucks and fifty cents per acre foot, and the State Water Project sells it for a hundred dollars per acre foot, and the people are growing the same crops on that water. So, you know, it's not a pure private property right. It certainly isn't in the sense that water has always been perceived under appropriative rights doctrine as being a public resource with a public trust attached that is given to somebody for beneficial use purposes, but can be taken back under different circumstances. And I think public trust doctrine in California, where you had Mono Lake being killed by Los Angeles, I mean literally killed, was a wonderful example, and that's really the fountainhead of public trust doctrine. I think it was very well applied there. So, this pure private property argument, just doesn't, to coin a phrase, hold a lot of water for me.

Greg Hobbs: Well, I need to respond to that. You know one person's subsidy is another person's waste. We tax through our elected representatives in the public policy arena to preclude or encourage certain conduct. Conduct to be encouraged includes growing a stable and secure food supply; American agriculture has been the strength of the world and America's arsenal. There we go again. The two shadows of our soul. We feed them, then we destroy them. Blow them out of the water. If we want a stable food supply, California agriculture, so richly productive compared to what we have here, is a strength. We have a fine agriculture economy, and it's important to the State, but, Marc, you folks out there get three, four, five crops. I really wonder if the long-term national interest will be served by hindering California agriculture. Food and a basic drinking water supply are the two staples of civilization. At Tikal the Mayan had it figured out. Fifteen hundred years for any city in any culture is a pretty good run. Sure civilizations have died; we're all going to die. All civilizations change. The apocalyptic books of the Marxist writers solemnly declaim that the irrigation civilizations have dried up and blown away. Hell, that happens a lot faster to those who don't have water.

Marc Reisner: The thing that impresses me most in my forty-two years of life is the creativity that people exercise in defending their right when they've got either a freebie or a good deal. They claim a God-given right to have that freebie or that good deal forever. A wonderful case in point: you've got crops that get subsidized water, and then become surplus crops because we grow too many of them: wheat, corn, cotton, rice. So then we pay farmers elsewhere not to grow the crops so that farmers that grow them on the subsidized water can keep growing them, and we call that an efficient system. That's all I have to say.

McDonald: Let me put out one final question, here, before we open it up to the audience, to Marc. Greg has pointed out that really the West built itself on storage water, that we would not have this population development in the West without those storage projects. We're in a period of time now where serious questions are raised about the appropriateness of building further storage projects. Do you feel that we should not build storage projects? Do you envision a storage project that has value to the West?

Marc Reisner: Yes, I can. I think some off-stream storage makes sense. The kind of small off-stream storage that they built along the Platte River to me is the sensible kind of storage. Flooding the rice fields in California in the winter time, because you get enormous numbers of waterfowl using them, flooding them shallow at first, and then flooding them a little bit deeper. But we're talking about going back to the future here. We're talking about using ideas that the Bureau of Reclamation thinks are 2,000 years old. And they are. We're talking about primitive, off-stream storage. I think it makes a lot of sense because it's much more benign than building a mainstream reservoir.

Now, I would support, in some instances, especially in California because it has such an extreme wet/dry climate pattern, small reservoirs on some of the flash flood prone tributaries, which can then store minimal amounts of water but enough so that you can certainly take the flood control responsibility away from the main reservoir, and that means it stays deeper, which means that water stays colder, which means it's better for fish. There are ways to develop water with minimal environmental impact, and, in fact, perhaps with environmental benefits. But the projects that I see being proposed, the Poudre River project that Greg's clients up there want to build, they want to create a wild and scenic river, but they want to leave a great big gap where they want to build a dam. Auburn Dam, in California, would be a monumentally destructive project to natural resources, raising Shasta, the projects that are being proposed are ones to me that are almost universally bad. I wish somebody would propose some good projects for once so I could get behind some.

Greg Hobbs: Well, let me tell you about the Poudre Project. That's a good one. Listen, here's another case of let's make a deal, then soon forget. Seventy-five miles of the Poudre River was made a Wild and Scenic river with the full support of Northern Colorado water users, including the Conservancy District, which vacated three storage rights up on the mainstem where the Wild and Scenic river is now in place. The last eight miles above the canyon mouth were excluded from designation for a future storage project, to be built if and when it is necessary for northern Colorado. Since the demise of the Two Forks, or the apparent demise, water marketers are looking to northern Colorado. We've got a big case against the city of Thornton right now, which purchased half of Water Supply and Storage Company. They're taking it out-of-basin, thank you, with very little regard for the folks who continue to live in the basin, perhaps accelerating the need for the Poudre Project.

A very specific agreement was reached to make the Poudre Colorado's first and only Wild and Scenic river by preserving water storage below the designated segments in the future, all sides, including environmentalists, slapping each other on the back in front of Sen. Malcolm Wallop's committee in the Congress. After everything is passed into law, all of a sudden we don't have a reservoir agreement any more in some person's eyes, do we? Because it's somehow evil to build any more mainstem dams. There is no way to reach an agreement and make it stick, it seems. I mean, where is the track record of credibility, when you do something like the Poudre Wild and Scenic river compromise, and then see that the bargain isn't kept?

Will we be able to meet our water needs in the middle of the 21st century? Those of us who

work for public interests, mostly the action right now is in the municipal arena as you know, we are worried about making a year round beneficial use, including instream flows for boating, fish, recreation, and other aspects of our economy that are beginning to be recognized. We can't do it without additional water storage. We may start out small on the tributaries, but there will come a time when the maximum, optimum beneficial use for all uses, including environmental values, will need more storage.

McDonald: All right. Let's open it up for questions from the audience.

Question: There's a vast amount of underground storage capacity that isn't being utilized, and I mean, starting at the headwaters all the way down. And those would have the effect if recharged with pure water, of bringing up the quality of all your underground water. This is long term. Now, I've got another real good question. If we're not going to become an extinct civilization, do you see any reasonable probability that there'd be any government agencies or combinations of agencies that would bring water into this state from Alberta and British Columbia where they have huge surfaces, so we can have good water in all these rivers that originate in Colorado? Because it doesn't take a genius to figure out that there ain't enough water to go around. And I'd rather put all this squabbling and fighting energy into doing something concrete and constructive, and doing it quickly.

Reisner: You're absolutely right about ground water storage, and part of this rice fields/wetlands/conjunctive use project we have going, part of the concept is to store some of the water during high flood periods, and inject it into your aquifer there. This would then allow some people who get water from the state water project to pump ground water and forego their entitlement, so that then they could send it down to L.A. God forbid, but that's part of the concept. Ground water mining is a problem all over the place. Agriculture in the West is a mining industry. It's not a farming industry; it's a mining industry. And you're right, at the rate that we're going, a lot of it is destined for extinction. But if you go up to Canada, and ask those people whether they want at any price to send you some of their water, they're going to say no. And they'll kick you out of the country. If they don't shoot you. So, if want to pull an L.A. on them and go up and steal their water, go ahead, but you ain't going to get it voluntarily.

Hobbs: Well I think these new schemes are fairly wild, and you're not going to pull them off, you know. These long transport systems. There's no doubt about it, the state Legislature just passed a state-wide water conservation bill; we've got to do that. We've got to extend our water distribution and treatment lines to cover some of the rural areas along with our cities. We've got to make more efficient water use. We've got to have regional planning and consolidation; we've got to have synergy between the Denver Metro Area and Northern Colorado and the West Slope for drought emergencies. The time is coming when we'll have interconnected distributions systems, replacement agreements and exchanges. However, you cannot move water around if you don't store it. You can't release into the stream for

environmental purposes, for recreational purposes, if you don't store it. All we hear right now is the anti-dam rhetoric. Yet public policy is at work in the western states.

The Natural Resources Law Center up at C.U. put out a book on water quality recently, which recognized that every western state has an instream flow program, except possibly New Mexico. We are incorporating some of these so-called public values. With respect to recharging ground water, we must do that in periods of high water flows, through ponds, off-channel reservoirs, and releases, and a network of recharge reservoirs.

The South Platte Basin Study examines all of this. Avoiding the mainstem Narrows and maybe even the Hardin dam, by an alternative system of small project recharge the farmers have already invented. Farmers down the South Platte are way ahead of us. They're using these augmentation pits to run water out of the river in the winter. Where unlined irrigation ditches used to be closed down and iced up, the farmers keep them open now and run the water to recharge, using those darn leaky ditches that the enviros want to line, supposedly to save all that waste. There's no waste. The water is recharging the aquifers during the off-irrigation season.

Reisner: Yeah, they make wetlands too. Let's just make sure that when we have these storage reservoirs that you want to build, to recharge those rivers or put flows in those rivers, that we have some rivers left to put them in. Also, you know, if you have instream flow laws, let's make them meaningful. Blacks were emancipated in the South in 1863, or whenever it was. That doesn't mean that the emancipation was meaningful. We've got a river in California, a beautiful river, called the Yuba, the South Fork of the Yuba, and the appropriators down at the bottom of the Bear River, which is right in the next watershed, the senior appropriators have built themselves a tunnel, of course, one of these little transbasin diversions in a canal. They took approximately 3,000 cubic feet per second out of the Yuba into the Bear and down the Bear. As a result, the Yuba was virtually dried up. Now we passed an instream flow law in California, but that flow demands that only 8 cubic feet per second go into the Yuba, which is about enough to float a toy boat. So if we're going to have instream flow laws, let's make sure that there's some flow in the law.

McDonald: All right. Other questions?

Kassen: Greg you talked about the fact that the media and environmentalists, and people who are shaping the debate over water use in the West are ignoring the environmental aspects of water conservation and use that are already built into the prior appropriations system. Now, that's puzzling to me given that you also resist attempts in water court to have the court consider polluted runoff as another aspect of waste, not just efficiency but the environmental impacts associated with polluted runoff. And you resist having the water court consider the impacts to the stream associated with water development which don't have an effect on a senior or another user, but have an impact on the stream. So I want to ask you to talk about how you see the prior appropriation system responding to a specific

example, and you don't need to use the hyperbole, because this is not an example that has any effect on the Northern District that I can tell. And the example is the one that Marc was talking about which are the salmon runs in California, and particularly on the Columbia River. How do you think the existing prior appropriations system can respond to the extraordinary impacts on the Columbia River and on the salmon runs? How does the prior appropriations system respond to this environmental travesty?

Hobbs: Now see, there you go, Melinda, environmental travesty. O.K. Now we're talking. And you point to one type of economy, you know, this is Kesterson, a very unique example.

Kassen: Don't talk about Kesterson. Talk about the Columbia River.

Hobbs: We're now looking at the salmon runs on the Columbia River. It's been a long time since salmon ran up the Colorado, as the bellwether for whether the prior appropriation doctrine can respond. Now, you know as well as I do, they're doing studies on the Reclamation dams on the Columbia River to see whether changes in operation can help some of this. Those dams were built to pull us out of the Depression and get us through World War II. Now, you want to displace their function.

Kassen: I'm not talking about taking them away. All right. What the question is is: Given that those dams exist, and given that there are people who will rely on those dams, but given that they've also had an extraordinary environmental effect on the salmon runs, if you don't change the prior appropriation system, using the prior appropriation system as it exists, what do you do? You just bag the salmon run?

Hobbs: Would you be offended if I told you that the salmon runs aren't necessarily the top priority to all people?

Kassen: So is your answer to the question, then, that you don't do anything, that you bag the salmon?

Hobbs: Listen, I don't think you turn over somebody's contract rights or private property rights back to the salmon when there was a public policy made to go ahead and develop the river. Now, I do think that if there can be some water marketing proposals, and there can be rights purchased back, or changes in operation to help the salmon runs, I think that's all right. But if you're talking about displacing the economy of the Northwest, to turn it back to the fish, I say that's not in the public interest. Your view of the public interest is colored by the special interest you represent, just as the one that I represent here does color a small bit of my advocacy.

McDonald: All right. Marc, do you want to make any comments on that?

Reisner: No.

McDonald: Other questions?

Question: I will say I did have a farmer in the San Joachin Valley once say to me, you know, you used to have billions and billions of passenger pigeons in this country. We don't miss them.

I'm concerned with irrigation water savings which will improve your system, and how that can be used in Colorado. They're doing it in the Imperial Valley Irrigation District in California. I'm trying to figure out how that can be used in California when you're mandated by a federal program to improve your system to stop the salt loading, how we can retain our water rights, and put those to a value for the farmers in a leasing arrangement with a good partner who would possibly pay to improve your system so that you can work out a good win-win situation.

Reisner: Well, that program involves L.A. paying the Imperial District several hundred million dollars to essentially line the canals and ditches. You know, that's very sandy soil down there, and some of those farmers put ten to twelve feet of water on their crops which means that there's loads of it going through the system that's leaking out all the time, and it doesn't go anywhere except into the Salton Sea. So, it's a unique example of leakage being bad, only bad, except for those people who like to catch those trash fish full of pesticides in the Salton Sea.

It's a little more complicated in many instances because first of all you can't point to anywhere else in the West where there's that much water, a third to a fourth of the flow of the Colorado River being used in one spot under very inefficient circumstances. But, the Metropolitan Water District does believe that there are 600,000 acre feet of potential water conservation savings in the San Joachin Valley using the same basic strategy. The problem is in California they had an enormous catfight over this because Metropolitan didn't want to pay for the water that's going to be saved. They thought it was there's by rights because they are next in line. You also, I'm sure as Greg knows, would have junior appropriators that would depend on leakage to some degree from the canals. So, it's a difficult situation, but I think we've got to, we've got to simply bear down on efficiency before we start talking about building new dams. There is inefficiency; no one can deny that. There's inefficiency in the distribution infrastructure, and in the subsidies which encourage the types of crops that we grow. And, nobody seems to be talking about that because engineers are in love with dams. And so are their lawyers, I might add.

Hobbs: May I respond? I think we ought to encourage those kinds of efforts in California. You know Colorado only uses right now 16% of Colorado River water. The big demand for the environment is because the lower basin states have extirpated the endangered fish but the effects are now being visited on the upper basin states when they want to develop their water. I understand the sense of California's loss. I grew up as a kid in Marin County in northern California, and it was great. It was great. California was a paradise. You can imagine what it was when the Spanish were there. Thirty million

people have affected it, and there is a great sense of loss. I sometimes think, however, that Californians' great sense of loss means that everybody else should lose. So, you have to look carefully at who's saying what. There's a lot of impact in the lower basin. They exterminated the native fishes. They're making the great bulk of water use. Colorado uses 16% of the Colorado River. Whether we'll ever get to our full entitlement, however, will be dictated by what California does. We need to encourage Californians to do some of the things Marc has written so eloquently about. Californians need to solve their own problems and not out of our water.

Question: I guess I didn't make my point. We are irrigators on the Colorado River. We are being told that the we are to cut down on our seep, it's not to go through. It's not necessarily sandy soil, it goes through the bank of shale. There must be a way that we can retain the right to our water, and improve our system, and keep that water. And I'm saying isn't it possible, if we think hard, to possibly come up with a partner beside the Bureau of Reclamation? To do something so that we can retain our water right and use or lease the water that's saved.

Hobbs: Well, as you well know, the legislature has passed a bill calling for a study in the Grand Junction area, to see whether "salvaged" water can be sold for other uses. Who knows, it may be instream flow uses. It may be other consumptive uses. I don't know, but that study is going on. I think we have to watch that someone's salvage effort is not really somebody else's return flow appropriation which is being sold out from under them.

Question: We're sixteen miles from the state line. There's no water user below us. Are you going to take it back up to Denver, or are you going take it out of Green Mountain and not release it? Our saved water.

Hobbs: I think that's why the Water Conservation Board's got a study to do on this issue. When the legislation was kind of cranking through, nobody quite knew what the effects might be. I can see some of that water being retired to the stream, perhaps, to help endangered species.

Question: Oh, I can too, as long as it's leased from the water right holder within an agreement.

Hobbs: Hey, I believe in that. As you know, the Northern District has had free market transfer of Colorado-Big Thompson water rights since its existence. Fifty years.

Question: Greg, I'd like to say that I agree with your premise that the existing appropriation system can support environmental values. As an example, Boulder is currently pursuing an instream flow program in conjunction with the Colorado Water Conservation Board, and we believe that Boulder's instream flow

program is a continuation of our philosophy of putting our money where our mouth is that we started with our open space program. Environmental and instream flow values are of importance to our community, and we have dedicated a portion of our senior water rights to the conservation board for this purpose of maintaining instream flow values on Boulder Creek. We do not agree with the premise of taking water rights for this purpose; we agree with buying them. And we agree with working within the existing systems. I believe rather than changing the system, it is more a matter of managing the water storage and delivery systems to reflect our changing values, and I would like to hear your views on this issue.

Hobbs: Marc?

Reisner: No, she asked you.

Hobbs: Amen. Say here. We agree. Let's get on with it. Let me respond in one sense, because Marc has put the onus on agriculture, and gee, I think, because agriculture uses so much water, so much more than the urban West, that's really where you look to get the most bang for your buck. It certainly is the case in California, Marc argues, but there are instances where one might want to preserve irrigated pasture land because it can hold off development. And as you preserve irrigated farm land around Boulder, that might seem like very inefficient use to some, but it's some wonderful green, open space. I'm all for it. So all these things have their place on a case-by-case basis, without putting on the old hoary ideological suit of armor most of us wear. One has to be inconsistent, where necessary, to do the greatest good. As Emerson said, "Consistency is the hobgoblin of small minds."

Reisner: But I think generally speaking, conservation is the way to go. Meaningful instream use, or instream flow now reflects public values, more so than enormous diversions, both subsidized water to raise low-value crops. And to the degree that Westerners resist these changes, that's when you get revolution. I think, if Greg is going to write off the salmon in the Columbia River, we're going to have a revolution. You're not going to have a forum. And believe me, there are a lot of people up there who think the salmon are a hell of a lot more valuable than irrigated corn in Idaho.

Colorado's Non-point Control Program and Hydrologic Modifications

Karen Hamilton

U.S. Environmental Protection Agency

Although my office for the past two and half years has been a closet in a Denver high-rise, it's been a privilege to work in the non-point source program at EPA, and the reason I say that is because I've met wonderful people with a wide variety of backgrounds, perspectives, and experiences, all over the region and in Colorado, from Wray to Montrose, and from Craig to Pagosa Springs. These people have enriched my life, and I'm really glad to see that some of them are here today.

Today I'm going to describe Colorado's proposed hydrologic modification or hydromod program and its development compared to other states' approaches, and reflect on the program's meaning to Colorado's aquatic natural resources management. I would like to first set the stage with a definition of hydromod and provide a couple of examples. Clean Water Act says hydrologic modifications are changes in the movement, flow, or circulation of any navigable waters or ground waters, including changes caused by the construction of dams, levees, causeways, or flow diversion facilities. And furthermore, EPA non-point source guidance subcategorizes hydromod into channelization and dredging, dam construction, stream-bank erosion, bridge construction, riparian modification, and flow regulation and modification. And as you can see, dam construction is just one part of hydromod, although we've been talking a lot about dams today.

It can be difficult to assign changes in hydrology to hydromod, especially if those activities that cause the changes are due to agricultural activities, or mining activities, or any other kinds of activities. In that case, where do you assign the impact? One of the most dramatic examples of hydromod impact is that the decline of migrating fish in the Pacific Northwest. And it seems like we've been beating this one today, but I think there are some real important lessons to be learned here, that can be taken home to Colorado even though we don't have any migrating fish.

In the Pacific Northwest, at least 116 native stocks of five different species have become extinct. Of the remaining stock, 50% are at a high risk of extinction. And the reasons for the decline are our habitat loss and damage, including inadequate flows and passage, over fishing and negative interactions with other salmonics including stocked fish. Notice that this does not include the traditional concept of water column pollution as a reason for fish losses. And many of these losses occurred due to the development of impassable dams and diversions after regulatory mechanisms such as 404 and the National Environmental Policy Act were in place. For example, the Dworshak Dam was created in 1974 and it caused a total block in the Clearwater River in Idaho, with no mitigation or allowance for passage, and the stock is now extinct. The loss of the Northwest Salmon is not trivial. It really is a very important part of the economy of the Northwest. It has severely disrupted ecosystems, limited the sport and commercial fisheries of the area, led to divisive and very costly region-wide battles, and required literally billions of dollars, of public dollars, to study and unsuccessfully attempt to fix the problem. The loss of

the salmon is also the loss of a remarkable biological phenomenon which is really the essence of the Northwest. It's as if we took our own mountains and flattened them. The tragedy is that it was unnecessary because proper design would have prevented the problems, and to fix it now would be magnitudes more costly and contentious than if they had been designed properly in the first place.

Then closer to home, people are familiar with the four Colorado River fish species that are threatened with extinction because of changes in hydrology and temperature due to dam building. And before the turn of the century even there was a yellowfin cutthroat that became extinct because water diversions would route the fish into meadows during spawning runs. De-watering streams and flushing ditch sediments into streams does not only eliminate fisheries and threatened non-game species, but we do see the ability of the stream to provide functions, such as sediment movement, water storage and flood control.

I was going to describe a little bit about the task force, the non-point source task force, because the hydromod subcommittee is a part of the task force, but Dan, I think, was planning on doing that, so I'll defer to him. I would like to just mention that in general, Colorado's task force is similar to the other states' task forces, except that it is a little bit more formalized because of the role the Water Quality Commission plays. Wyoming has a little bit different approach in that all the people that are on the task force are non-governmental people and they're appointed by the governor. All the states' non-point programs are voluntary with a significant emphasis on information and education and demonstration watershed projects. At EPA, the non-point source program is considered to be at the leading edge of pollution control because it uses techniques such as pollution prevention, ecological risk, individual responsibility for pollution control, and environmental education for the public.

Now I am going to go into the hydromod program. And first of all let me say that the subcommittee makeup was a little bit different from the other subcommittees. The hydromod subcommittee was comprised, to a significant extent, of attorneys and engineers that sounded like attorneys. And if you don't think it's difficult to throw some scientists together with a bunch of attorneys, I've got the gray hairs to prove that it really is. I think the reasons for this particular subcommittee makeup were, that there was a perceived threat to the ability to freely exercise water rights, and that a voluntary program would eventually become regulatory, perhaps through the cross-compliance measures that Bennett Raley was talking about this morning. I would like to point out, however, that EPA's regional administrator and Administrator Riley have both strongly indicated their desire to keep that program voluntary. And in particular there's considerable reluctance by EPA to even address hydromod because of the implications of water management and water rights. On the other hand the Coastal Zone Management Act guidance does include management measures, as Melinda so nicely described this morning. Some of the Senate versions of the Clean Water Act Reauthorization contain some language regarding required BMP's, but not specific to hydromod.

The most recent issue of EPA non-point source news notes, which usually looks like a GAO report, does have a summary of the Coastal Zone Management Act (CZMA) guidance in it. And it might be of interest because some people think that you're looking at a prototype for 319. I've also provided a

display copy out there of the proposed guidance for CZMA.

The hydromod subcommittee might have worked better, or at least not taken quite so long, if technical people could have developed the program independently of legal issues. And in fact, later on the Water Quality Control Commission did separate the subcommittee into a legal and a technical work group. The subcommittee attempted to deal with several closely related issues. One of these was the pollution versus pollutant issue. Many participants argued that the Clean Water Act regulates only the discharge of pollutants, and that any BMP's which are included within the 319 program should be limited to measures which address the impact of pollutants created by and discharged by the regulated facility. Others argue that under that view, many of the impacts of hydromod were ignored, especially those that affected aquatic habitat and therefore only one-third of the Clean Water Act objectives were being addressed. Embedded within this discussion was the assertion that 319 only pertains to pollutants and not pollution.

The Clean Water Act defines pollutants as dredge spoils, solid waste, incinerator residue, sewage, garbage, sewage sludge, emissions, chemical waste, biological materials, radioactive materials, heat, discarded equipment, dissolved oxygen and CO₂ and industrial and municipal and agricultural waste discharged into water. Pollution, on the other hand, is defined as any man-made or man induced alteration of the chemical, physical, biological, and radiological integrity of the water. The subcommittee was assured that a program that mentioned measures or approaches to address pollution would be rejected by the water development community and the Water Quality Control Commission. Well, I don't think we ever reached any agreement on this particular issue, but we did decide to narrow the focus so that we could move ahead with the project. And using the narrow view of the Clean Water Act, most of the subcommittee felt that considerations of habitat or physical integrity were beyond the scope of Section 319 and therefore we should not list BMP's that would improve the physical function of a stream or its flows, such as: adjusting the channel form and roughness to accommodate expected changes in flow in order for the stream to better provide for aquatic life, voluntary donations of water rights to provide instream flows, or timing of releases to reduce extreme peaks on the hydrograph and therefore extend the period of moderate flows. Others suggested practices such as basinwide planning were also considered by the majority to be inappropriate.

Finally, there was considerable discussion regarding the use of water to dilute pollutants. The concern here was that when an upstream diverter caused a downstream facility to discharge pollutants in concentrations that exceeded what was allowed by their permit, the diverter would be held accountable for the problem. The argument here was that the diverter did not create or discharge the pollutants, and so they should not be held responsible for the problem. And furthermore, it's been against EPA policy to use water to dilute pollution. We have to remember that facility designs in watershed management always use assimilative capacity to determine permit requirements.

To me, and I'm sort of a simple person, it's a question of responsibility. Not in the fingerpointing sense, but in the sense that it is a joint community, county, and state responsibility to maintain the water quality and usage that we enjoy in this state. It is more and more important that we work together with

a sense of coordinated responsibility rather than trying to blame somebody else.

We did agree on a list of potential impacts to the chemical integrity of the water resource, and potential appropriate BMP's to deal with those impacts. Some examples are changes in nutrients, dissolved oxygens and other chemical constituents, changes in temperature, or turbidity. Some BMP's that we would perhaps visit in the future, are for the design and use of mixing towers, reservoir release structures, stilling basins, downstream channel improvements, and perhaps the identification of construction, operation, and maintenance concepts that would minimize the impact of in-channel activities.

Well, the first hydrologic modification program was sent to the commission in January of 1990, and the commission rejected it because nobody supported it. That's a pretty good reason. So the commission then divided the subcommittee into two work groups. One was the legal work group, and one was the technical work group. The technical work group refined the management program, reworked it, and then submitted it to the legal work group last fall. And the legal work group added some suggested changes and recommended additions. So now what we have is the January 1991 program with various suggested changes on it.

The main part of the program is a BMP which is in fact a process to review identified adverse non-point source water quality impacts associated with hydromod and then to determine the most reasonable approach to achieve water quality improvements in a cost effective manner. The plan also lists milestones for refinement of the program, watersheds and projects, potential impacts, which I mentioned briefly, and potential management steps and a list of references. So there's no real on-the-ground set of BMP's as you'll find in the other programs.

I think the subcommittee should definitely be applauded for this step. The program still needs some work, but if nothing else, it brought together people into one room for two to three years that may have otherwise never even talked to each other. In fact Colorado and Wyoming are the only two states that I know of that even have a draft type hydromod program at this time. Wyoming's program is considerably more typical of a non-point source plan in that it describes right up front, existing programs, whether they're regulatory or not, that may address this issue, as well as providing a list of on-the-ground BMP's, such as construction procedures. However, the non-point source task force has not yet seen this plan, and it's just a draft, and I can't give you a copy of it.

Other states address hydromod without a formal hydromod program in place. For example, Utah is funding a stream team, in which the partial salaries of people from agriculture, wildlife resources, and water rights come together to help obtain better 404 permit applications and also provide technical assistance on channel configuration and restoration for watershed projects. California also funds a partial FTE or salary of a person who is involved in a number of activities, one of which is working with the Pacific Gas and Electric Company per a memorandum of understanding to establish BMP's that reduce sediment loading from water projects. The person provides testimony to the State Water Resources Board regarding operation of utilities to prevent fish kills. He provides conditions for FERC licenses. Finally there's a 75,000 grant to the Klamath River Basin, to target BMP implementation to protect spawning habitat of salmon.

Other states have identified the importance of maintaining functional stream channels, and have developed state laws which are part of their management programs. Montana, for example, has two laws. One is called The Stream Protection Act, and one is called The Natural Stream Bed and Land Preservation Act. These both do pretty much the same thing, but target government entities and then non-government entities. They've also printed a brochure called "A Guide to Stream Permitting in Montana" to help people to know when they need a particular permit and when a permit is applicable. In Idaho, there's an Idaho Stream Alteration Act that's similar to Montana's, and Washington has a hydraulic project approval permit that's required to protect fish life and habitat. It provides project review and conditions to prevent habitat destruction and to protect water quality. Most of these states have some sort of environmental policy acts like the national act.

Kansas, I just learned last week, and I don't know the particulars on this, has some sort of regulation regarding management of riparian areas too. EPA in region 10 has a riparian policy and the Soil Conservation Service has a draft riparian policy for its agents when they're providing technical assistance. And as you heard before this morning, there are comprehensive restoration and protection initiatives that cut across jurisdictions' and agencies' non-point source categories and that use voluntary and regulatory approaches all across the country, because there are some very valued water resources that are in severe impairment. At this point these initiatives are very expensive. Pollution prevention is cost-effective in the long term, and I think that the long-term is getting shorter and shorter.

Finally, EPA is expanding the traditional concept of water quality standards, as Bennett Raley mentioned this morning, to include biological and sediment criteria. And based on recommendations from the science advisory board, which is an independent panel that advises EPA, EPA is beginning to put ecological risk on the same par with human health risk because of the direct relationship between ecosystem health and human society sustainability. Administrator Reilly is calling for a national debate on setting environmental priorities, and that's described in the recent EPA journal.

Based on these examples, I think it's obvious that a hydromod program as part of a non-point source plan is not the only avenue to identify, implement, or even require management practices that maintain the integrity of water resources. Some people are even predicting increased regulation, perhaps with 319, perhaps through other parts of the Clean Water Act, or even other pieces of legislation. Arguments over pollution and pollutants will become moot. Where communities and states have developed their own program to meet the Clean Water Act objectives, it's less likely that BMP's or management approaches will be imposed by Washington, D.C. Failing to develop comprehensive plans out of fear that the plans will become regulatory may actually increase the potential for regulation.

Well, where does the hydromod program go from here? I think that will partly be answered August 6 when the Water Quality Commission will be hearing comments on the hydromod program. And in evaluating this program, one of the questions might be whether a hydromod component would actually enhance the non-point source program, and if so, what form should the hydromod program take to help the non-point source control program pollution and protect the integrity of the streams. I think that in some watersheds, water management may actually be the key to the success of water quality improvement

efforts, even if hydromod is not identified as an impact.

In the hydromod program, BMP is meant to "provide for consideration of interaction of multiple pollution sources in determining cost-effective control strategies." Based on the discussions that we had in the development of this program, I'm skeptical about the potential success of a process which relies on voluntary participation and willingness to accept some responsibility to contribute to agreed upon water quality goals. Furthermore, calling a process a BMP is also highly questionable in terms of the Clean Water Act requirements. On the other hand, like I said, I think Colorado has come a long way in creating, or even producing this program, and I think that this should be taken into consideration.

The responsibility for pollution control was forced on industry and communities with the National Discharge Permit Process. Was it cost effective? Would a voluntary program have worked better? What state would our economy be in right now if we were facing the kind of environmental degradation that Eastern Europe is looking at right now? In Montana, the silviculture industry is shouldering its responsibility without arguing the fine points of the law. It is spearheading education programs that promote practices to protect riparian areas and water quality. The agricultural community is moving to improve practices because of its fright of regulation and because I think that the farmers and ranchers honestly care to maintain their resources, whether they are soil or water, for the future. Most individuals and communities want to use their resources wisely, make their own decisions, and not be regulated by outside government. But without cooperation from everyone who affects water quality, especially those with significant influence, regardless of specific legal requirements, management may be ineffective.

In order to determine what is cost effective and manage for a prosperous future, it seems that one of the questions might be, what is the value of Colorado's water resources? And that value is partly determined by the water rights market, as we so aptly heard this morning. Some other water use values are not so easily determined, but I think there are some clues for some of these things, for example, in the tourism sector of the economy. In the last ten years, expenditures for tourism have doubled in this state from 3 to 6 billion dollars, and recognizing the importance of tourism, Colorado spends the sixteenth highest amount of money of any state to advertise its tourist attractions. Three hundred thirty-four million dollars in direct and indirect expenditures comes from fishing, 20 million dollars from Gunnison County alone.

Based on a study funded by the Tourism Board, some of the most important things that people look for are number one, exciting experiences and unique and beautiful settings. The more exciting, unique and beautiful things that are experiences that Colorado can provide, the more it can compete. But what makes Colorado wealthy and exciting? Is it bluegrass lawns, or wild cutthroat trout fisheries? Is it all or nothing, or is there a balance between acres of lawns and miles of intact streams? Of course, these are only two of the values, and there are many values associated with our value of water resources. Are there other less water-intensive ways to have both beautiful landscaping and fisheries? Can Colorado afford to ignore the function and values that an intact stream or lake provides? Will those assets that we take for granted now, continue to provide for Colorado in the future under present management?

We should keep in mind, as we've heard so many times this morning, that Colorado's resources are

also considered a national asset. And you know what? I brought my own copy of Time magazine too. I think a unique challenge, a window of opportunity, as the Lt. Governor said this morning, is presenting itself to the water development community managers, and I mean the managers, not the attorneys, to demonstrate strong leadership in total water resource management. Rather than relying on courtroom slugfests to develop a water policy, the managers could help find a path to public water policy that brings strength and prosperity to Colorado. The non-point source pollution program, if it's used effectively, could be one way that Colorado's leaders, and those who manage the water resources, can help the people of Colorado understand their choices and make wise decisions in the management of these valuable assets.

Non-point Pollution and Agriculture in Colorado

Dan Parker

Director, Colorado Soil Conservation Board

I want to do a little bit of Show and Tell first, and then we'll go into some things on the overhead pretty fast, pretty rapid fire. I wanted to talk about some of the things that are here on the literature table. First off, the Colorado Conservator, which is now billed as the non-point source newsletter of Colorado. If you're not on this mailing list, you can be so free, just let us have your name and address. This comes out roughly five times a year, and its the public distribution piece for the non-point source water program in Colorado. Just a little thing that I've got to toot my own horn a little bit here is a deal on solar stock watering. We just had five thousand of them printed, and I don't know how we're going to get rid of five thousand, so I thought I might get rid of them here. Another piece out here is the Colorado Water Quality. This has been put out by the Soil Conservation Service of Colorado, and it shows an irrigation system on the cover, which is one of the things that we're doing with water in Colorado. My agency has four people working with this full-time. We are increasing irrigation water management, and irrigation water efficiency up to as much as 95%. Another piece that's being put out jointly by some of us in Colorado is Clean Water Starts with You. You can't miss this color. It's out there on the table. It's on non-point source water pollution. Then another piece that's being put out is Colorado Water Quality, and inside you'll find some information about water quality and self-help checklists, and then a group of fact sheets about some of the assistance that you can get from soil conservation districts and the Soil Conservation Service. These are all available on the literature table, and you can take those at your leisure.

I'm going to do several things when I talk to you. I'm going to talk a little bit about the formulation of the task force and the subcommittees. Then I'm going to talk about the purposes and goals of various agricultural programs. I'm going to show you a map of a location of the approved projects in Colorado, and then we'll talk about some of the points of controversy in this whole area, and then I'll finish up with a conclusion which is water quality rule #1.

Non-point sources of pollution are those that are diffuse in nature, and not regulated through a permit program of the Clean Water Act. Now I thought it was rather interesting, this morning, the various kinds of sources of pollution were raised several times, and nobody ever said anything about urban sources in all of those presentations. Agricultural, mining, forestry, but nothing about urban. Urban areas and urban construction contributed considerable non-point source problems to various segments and places in Colorado. Now the various pollutants that we deal with are sediment, turbidity, heavy metals, nutrients, primarily phosphorus and nitrogen, bacteria, and pesticides. And it's a voluntary program, and to date it's a demonstration program, for the most part, in Colorado.

The organization of the task force is very brief. Its primary responsibility is to provide water quality control data to the Water Quality Control Commission and the Water Quality Control Division

of the Department of Health. The task force was created in May of 1987. It's made up currently of 25 members, or 25 seats. The terms are one year at a time, and the seats change from year to year depending whether a group wants to be included on the task force or whether they want to bow out. If they bow out, then some other group that's on the waiting list is invited to send a member to that task force. They meet every two months. There are four subcommittees: the agricultural, silvicultural, the urban and construction, mining, and hydromod.

One of the things that you may not be aware of is the funding that's available. We have grants. There was \$300,000 in 1989 that was taken from the governor's discretionary fund from construction grants program. Then in 1990, there was \$1.5 million taken from that governor's discretionary fund to be spent through the 1992 fiscal year. That was before we got any 319 appropriations from the federal government. Then the 319 appropriations started with \$40 million nationwide, and Colorado's share of that was \$486,757. Then we have ASCS funding, Agricultural Stabilization Conservation Service funds for special projects. Generally the funding ratio percentage for all of these is 60% grants and 40% local match, which can be hard match or soft match.

Now we go into several different kinds of agricultural programs, water quality, non-point source programs. The special one is special projects, and these are ASCS, Agricultural Stabilization Conservation Service special projects. First off they can be addressed to any agricultural non-point source program. They're authorized by the ASCS which is an agency of the USDA. They're limited to ACP practices. Now you farmers and ranchers know what we're talking about there. I think maybe we have a one up on the lawyers, because they may not know what ACP and some of this alphabet soup is that we use in agricultural circles. So we'll keep them in the dark. That'll be an unusual phenomenon for them. So it's limited to ACP practices and there's technical assistance always available as well as cost share dollars to the land owners to install those practices.

Another kind of program is what we call a demonstration program, and this is large scale demonstrations of current technology to reduce the transport of agricultural chemicals through soils, through ground water and surface water. Now these are demonstration projects by the U.S. Department of Agriculture. The leadership is provided by the Department of Extension and the Soil Conservation Service. And they do those sometimes together, sometimes jointly, sometimes one is the lead agency and the other is the support agency and vice versa. The funds for land application practices are provided again by ASCS due to the ACP program, Agricultural Conservation Program, and it's a voluntary program that concentrates on technology transfer to the individual land owner.

Now just one more word about the SCS Hydrologic Unit project. It provides educational and technical assistance to landowners and agencies seeking to implement best management practices that will meet specific state water quality requirements. And there's been a special emphasis on ground water quality. Now leadership is provided again, primarily by the Soil Conservation Service, supported by the Department of Extension. And the funds are available here for technical assistance and education, from Section 319. And the cost-share funds for installation of these best management practices comes from the ACP. And again, this is a voluntary program to prevent non-point source pollution of regional

watersheds. They look at these hydrologic units, look at a whole watershed, and they may not take the whole watershed in their final project, but they look at the entire watershed as they design that particular project and those practices.

The 319 program itself can have both educational programs and demonstration projects. They are managed by the Water Quality Control Commission and EPA. The contract is administered by the Water Quality Control Division of the Department of Health. And the project can include any BMP's that are listed in the state management plan, a much broader group of BMP's than are listed in the ACP program.

Let's review the steps necessary to get a 319 project approved. Project sponsors start with an idea for a project. They write a proposal, and then it goes to one of the four subcommittees - basically, the three that are being operated now. The hydromod hasn't been operated to consider an application for program and projects yet. Then the proposal goes to a full, non-point source task force. Then it goes to the Water Quality Control Division, and the Water Quality Control Commission. If they approve that, then it goes to EPA. And if EPA approves it and doesn't give it a final veto, then it goes back to the Water Quality Control Division with a contract. And then the Water Quality Control Division contracts with the individual project sponsors. And that can be a real slalom course, if any of you are skiers. You wind your way through. But that's the process.

Grants from 319 can be used for a whole group of things. Installation of BMP's for administration, for monitoring, for technical assistance, and for information on education, are all things that the 319 grants can be used for. Some of the other programs from the USDA agencies may not be able to be used for all of these particular items that the 319 can. Projects are selected for 319 funding based on several considerations. Not any kind of project is selected. We have a number of beneficial uses that are impacted. The more beneficial uses that can occur from a project, the higher up the level that project is placed. If the impact that it is addressing is a very severe problem, then this elevates that project to a higher level of consideration. Does it meet some of those state and national priorities that we may have? That will elevate the project higher on the list. Consideration is also given to the effectiveness of the BMP's or the improvements that are to be made as a result of this demonstration project. If we think that these BMP's may work, and we need to find out quickly because we don't have any other thing that's any more effective, then that project will be elevated higher, too. We can then see if that BMP would actually work and do the things that we hope it would do. And then, of course, the technology transfer potential is also a consideration. Is it a project that we can use? Can we find out some things to do that can be readily replicated all throughout that area or maybe even throughout the entire state? These are all some of the considerations of the project selection.

I want to give you an idea of where some of these projects are around the state. They're all over the state. There are about six agricultural projects. Mining projects are actually abandoned mine sites where we are correcting some of the leakage that is coming from abandoned mine sites. I think there are seven of those throughout the state, and they run right down through the whole mineral zone of Colorado. Educational projects, some of those are out individually in various counties, some are

statewide. The newspaper that I showed you earlier is an educational project. There is a grant from 319 to cover the bulk of the cost of the printing of this newspaper. And then some of these other projects, like the one in Antero County is a hydrologic use operated by the Soil Conservation Service. Another project is a single ditch, the Holbrook ditch, that is run by the ACP, an SCS special project. Over in Saguache County, that should be the whole San Luis Basin, is another special project of the USDA that is operated as a cooperative extension. In Larimer County there is a project that's operated by the Northern Colorado Water Conservancy District.

Now I want to talk a minute or two about some of the points of controversy. We have some internal issues with these current water projects. We have a relationship between a land owner, the Soil Conservation District, and the Soil Conservation Service. And I pick that mix of three because these roles have changed. For fifteen years, the role of the Soil Conservation Service and the role of the Soil Conservation District was to be a friend and a helper to the local landowner at their request. Now since 1985, the Soil Conservation District to some extent and more so the Soil Conservation Service has become a quasi-regulatory function. This has changed their entire role and the entire relationship with the individual land owner. And so we have a lot of internal problems as a result of this kind of shift of emphasis. And if you think that it's easy to make that kind of shift in emphasis where you are dealing with individual land owners and a national bureaucracy, well, I'll tell you, it makes a big difference. Because most of the staff people, for instance, in that bureaucracy, grew up in a whole different mode of operation than the quasi-regulatory. They don't know how to work in a quasi-regulatory function. And they stick their foot in their mouth every time they turn around, because they've never had any practice with that. And the land owner goes in there and asks a simple question, and he gets bombarded with the whole book of rules and regulations, and that never happened before. This is a massive change, and if you think we can do this in four or five years, you better leave now, because it doesn't happen that way. It takes a long time.

And that's the kind of thing, the baggage, that this non-point source pollution and the Water Quality Control Act, and the various farm programs carry with them. And a lot of people haven't been willing to recognize that fact. It takes time for people to change their attitudes and to be able to get into a different frame of reference when they've been dealing with the same kinds of people that they've dealt with for the last fifty years. And the Feds don't give us the time to do that. No regulatory entity gives us the time to do that. It goes from nothing to 100%, overnight with the President's signature. There are many changes we must go through if these programs are going to be meaningful. And if it they aren't, it's just going to be something that we're going to do as long as the regulation is there. And as soon as that regulation leaves, we leave. Or the project leaves. It just gets deserted. Unless we can have this ingrained enough into us that it becomes a part of our ethic. Then that ethic will drive us. Just like the speaker at lunch talked about. If we develop that place mentality and ethic, then we can carry on some of these kinds of things. If not, then they're going to drop like a hot potato.

We've got an excellent relationship between the Soil Conservation Service and ASCS and the extension service. Because of cross compliance and interrelationships, and the new regulatory functions,

some agencies are having a lot of problems changing their role. Some of it is turf battles, and some of it is just plain changing roles. Some of it is personality conflicts. They worked in one venue for so long that they just can't change over to the other. So we have one person calling the other an S.O.B. and the other one calling first person an S.O.B. You have to work through all that kind of thing.

Now, external issues. We've got the whole issue of the attitude of the perceived conflict between the landowner and compliance of any kind. The landowners always thought that this was pretty much their own purview and they could do as they wish. But now all of a sudden compliance comes in and says, no, they can't do that. Well, if you couch this in the fact that you can show the land owner a better way to build a mousetrap where he comes out with a bigger and a stronger bottle of wine, then boy, it's great. It's all sunshine and roses, and that's what we've tried to do as much as possible. But sometimes you just can't do it that way.

Now another external problem is the EPA versus the project sponsors. This is a constant problem. It is perceived by a lot of people that EPA has an absolute veto over the Water Quality Control Commission's actions. If the Water Quality Control Commission approves a project, and it should be funded, then there's a lot of people who ask, "What right does EPA have to veto that?" No, we aren't going to take that. It isn't a high enough priority. But the EPA has told the local people, you determine the priority and you make the selection process. So we've got that same problem that we talked about this morning, about at what level is the decision made.

Another problem is the slowness of approving project utilization plans after the initial approval. And some of these contracts have gone on for five and six months, and they break before they get through. The project sponsors are all raring to go. The landowner cooperatives are raring to go. Everybody wants to get to work, but they can't get a project implementation plan approved and the necessary contracts written. There is also a perception on the part of the local sponsors and the landowners that because of this delay in the project improvement plan, the local sponsors end up putting in a lot of time and a lot of money in advance of the contract being approved, and then they're told they cannot be reimbursed for their time and their energies. You can't do any work and get paid for it until the contract is signed. So these are some of the problems we keep working out.

Another external issue is the one of the riparian versus the landowner, or wetlands versus the landowner, or whatever you want to call it. But anyway, it's some of these specific kinds of issues and problems. Now one of the things that we're doing in my shop, and the local Soil Conservation District is, we're trying to encourage land owners to come forward with some of those success stories about how they've recreated wetlands, or they've restored wetlands, and it has enhanced their whole operation and their entire wellbeing. They've enhanced riparian areas. They've repaired riparian areas. And it hasn't negatively impacted the grazing system at all. In fact, in some instances, it has enhanced it. We want them to come forward with these kinds of success stories so we can publicize them. Because in many instances, there is no tension between them. It's just that we perceive historically that there has to be a tension there. And there may not have to be. There may actually be complementary kinds of things that we need to look for. And then of course, we've got the old adage of "old ideas versus new

practices." Now I won't go into any more about details like that.

Now, a couple of other general concerns. One is ground water. And where in the world is the task force that's working on Senate Bill 126 going? They're supposed to be coming up with a whole new set of BMP's. How do they fit that into what we're doing with non-point source water quality? Nobody knows yet. And also we've got a lack of data base on ground water. And we'll be talking about that in the session that follows immediately after, because we're going to have one of the staff people from this special project in a district of substantial agriculture, Weld County, to talk with us a little bit about this. And we've got the general perception is that testing must be a threat. Whereas, testing can be the best insurance you can have. And we need to look at that.

Now I'm going to finish up with this last quick slide that will kind of make everybody, I hope, feel good. Water quality rule #1, if a designated beneficial use is not marred or threatened, a water quality problem does not exist.

Paul Frohardt: There's been a lot of discussion this morning about non-point sources being the area that generally was not addressed initially under the Clean Water Act, the need to address that area, and some current debate about whether it's going to be possible to address those problems from a voluntary standpoint, or whether the federal government is going to feel it is necessary to impose more regulatory requirements to address non-point sources. I would be interested in either of your perspectives, having dealt with these issues in Colorado over the last couple of years, whether you feel that the efforts that are currently under way are likely to result in significant real-world progress within a reasonably short time frame, or not?

Parker: You've got several questions in there. First, let me talk about the old clean water program, the 208. I was deeply involved in 208 activities. We had six projects all ready to go with implementation, and we were told that there was not one single dollar for implementation. It was all for planning. And so we had to put those projects on the shelf. Now three or four of those projects have come back. Some of our early 319 work is on those projects. Now in our office, we've got two full file drawers of those old 208 projects. Those things have really been used the last two years. It saved us a lot of time and energy to get us to where we've been able to get. But the basic problem was that there were no implementation funds, at that time, when the 208 project was going in the late '70's and early 1980's. The other thing is that here in Colorado it has taken us about 150 years to get in the mess we're in now. We're not going to fix it in three. It's going to take a long time. Now any federal bureaucrat or elected officer that thinks that they can mandate the fixing of these things in three or five years, what's taken 150 years or so to be degraded, I think should be hanged. It just doesn't happen that way. Nature has fantastic powers of rehabilitation, if we give Nature a chance and give Nature a little bit of help.

I think some of these projects are going to be able to show some very significant kinds of activities. We're involved in one on irrigation water management. We got into it on the idea of energy conservation. But we've come to find out that we can increase the efficiency from somewhere in the

neighborhood of 40 or 50%, up to as much as 95%. And it's taking us a while. Here's a technology that we know works. We've been at it now for six years, and it's working. But it took us five years to get the infrastructure to be willing to say that yes, they would support that. In other words the dealers of irrigation equipment. Now if you don't have a dealer that will supply you with irrigation equipment and with the parts, how in the world can you put in a new system? You can't do it. So you've got to work on several different levels. And this is what we're dealing with here.

Now, about this voluntary activity. I don't care who you are, if you see your neighbor doing something that's letting him go fishing two months of the year more than you can go fishing, or that he's going to get a couple thousand dollars more profit at the end of the year than you are, by gosh, you are going to do it. And it doesn't take a bat between the eyes to make you do it. And I think this is the kind of thing we're going to see if we give it time. If we force it, well, we're going to give the lawyers a lot of welfare.

Hamilton: I would just like to add a couple of things. This is a complicated question. It's very complicated. And I agree with what Dan has been saying; however, as many people said this morning, a lot of these decisions are being made where the populations are heaviest, which is on the East and the West Coast. And there's a lot of impatience on the part of those people. A lot of impatience. People feel like they've been asking for these changes for a long time and they don't see them. There is also some frankly scary understanding of Western problems, and what can be done and what can't be done. So I think that we really do have a very narrow window of opportunity, here, to move ahead. And even though it may take longer than what the federal government would like to see, we have to take the chance and move as quickly as possible.

There are, on the other side of the coin, several cases that I'm familiar with where there are obvious fence-line contrasts. In grazing situations. Obvious difference between one side of the fence and the other side. And yet the person that owns the land on the graded side of the fence, when he sees changes on the other side, continues to reject those changes, continues to say, well, that land is different, that land doesn't apply to me. My way of doing things is different, and so it can't possibly be the same. And this problem with attitudes is difficult to deal with, and people don't change overnight. But changes do need to come about, or else, I hate to imagine what kind of management controls would be applied. Based on what I know is understood in Washington, D.C., I don't think it would be very beneficial. On the other hand, some of the things that people are talking about are site-specific management measures. And at this point, I don't see a specific set of management measures being dreamed up in Washington, D.C., and then forced on our land owners out here.

Marketing Salvaged Agricultural Water

David Merritt

Engineer, Colorado River Water Conservation District

Sara Duncan

Legislative Program Officer, Denver Water Department

Moderator: Paul Frohardt, Water Quality Control Commission

Merritt: House Bill 1110, which was in the State Legislature this year, has a long history. It dates back to the 1970's with the advent of the salinity control program and with the recognition that we have to look at the most cost effective ways to remove salinity from the Colorado River system. About half of the salt load in the basin comes out of natural sources and about half comes out of "man-made sources" or irrigation usage and consumptive use of water. We have to look at trying to keep the salinity down by attacking the most cost effective sources. Some of the natural sources are very, very difficult to get at. They cover in some cases thousands of square miles of very diffuse loading.

So one of the areas they looked at from the very onset was the Grand Valley. There is a large amount of irrigation in the Grand Valley and it overlies very saline soils and has been going on since the late 1800's, and has very, very senior water rights on the system. Some of the water rights, which date from the 1800's into the 1900's, collectively compose what is called the "Cameo Call". I guess, pretty much everybody is aware of the geography of the Colorado River system, but Grand Junction sits just about at the state line. We have about 55,000 acres under irrigation down in this area. One of the ways that salinity could be improved in the river system was through more efficient irrigation methods. The system that grew up in the Grand Valley dates back to the late 1800's or 1900's and it was at that time the most efficient system that could be developed. There are approximately 1,000 miles of irrigation ditches and laterals in the Grand Valley.

This legislation was not directed just to the Grand Valley, and that was one of the concerns that was raised. Is this going to be special legislation, is it going to be something that the folks down in the Grand Valley are coming up with just to better themselves or is it something that could be utilized across the state? And then there were other people that were worried that it could be utilized across the state, so here we have both concerns expressed there.

What this bill requires is that we look at how water is used in irrigation systems in particular. We've got about four ways in which water is used in an irrigation system. One is direct crop consumptive use; just how much does the acre of alfalfa or corn or orchard consume, in growth. The other water use that we have is consumption by other plants, phreatophytes and wetlands. Throughout the West you can walk along and see where the ditches run or have run, by the greater amount of crops or greater amount of trees and everything else that surrounds the ditches.

Water is also lost through evaporation from canals and laterals. People might think that in a

system like the Grand Valley, where you have about 1,000 miles of laterals and ditches, an awful lot of water would be lost to evaporation. But, in fact, evaporation is only about 700 to 1,000 acre feet out of about 400,000 diverted, so it is a rather small amount that's actually evaporated from the surface of the laterals and ditches.

Your final method of water use is seepage which is returned to the river system. A lot of the water that is diverted out of the canals, out of the river, runs through the canals and runs over the crops either comes off the end of the canal, back through the river system, or off the ditches back in the river system or in the ground water. That's what the salinity control program is aimed at getting at, reducing that seepage, that pick up of salinity. About 151,000 acre feet of water that is diverted out of the Grand Valley comes back into the river system as seepage.

If we look at what we can do with these various usages of water in an irrigation system, we recognize rather quickly that we can't do much with usages one, two or three, either technologically or environmentally. You can't reduce crop consumptive use. An acre of corn requires a certain amount of water whether you put just two and one half or three feet of water on that crop, or if you put fifteen feet of water on that crop, it requires about the same amount. We can't do much with the phreatophytes or wetlands. We are hearing more and more that those represent habitat, those represent an environmental amenity. Even though they are not natural to the system, they are considered to be something valuable and protected nowadays. Neither can we gain much by reducing the evaporation from the free surface. There just isn't that much to play with, less than 1%. So the major thing we're looking at is reducing the seepage.

Reducing the seepage requires an enormous amount of capital costs. We have heard that there is interest in having the Imperial Valley improve their systems by contracting with the Metropolitan Water District of Southern California. That's one of the things that Colorado is pushing for, having California solve its own water problems by reducing its agricultural inefficiencies. It requires an enormous capital cost, requires long-term operational costs, greater than what they are presently doing.

Putting ditches in pipe or putting them in concrete makes it more difficult to clean them out. You can't go in there with pick and shovel as easily. You have to have a higher level of labor to keep these clean. We are going to see longer term costs associated with it. There is also a very big concern by the users down there as to what is going to happen with that water. If they make the investment, should the salvaged water be available for any other user on the system, or should they be able to retain ownership of that water and utilize it? Should they be able to sell it, put it to some other use, sell it or donate it for instream flow?

This was a genesis of the bill and it generated a lot of controversy. People thought it was legislation to be used only in the Grand Valley. Well it can be used in the Grand Valley because there is no one, immediately downstream, there is no filing on their return flows, no one using those. It could be used in the Gunnison or the Uncompaghre system, in the same way. There are some ways in which it could be used on the Front Range, i.e., if you are downstream on the South Platte and there are no irrigation or other users that are down from you.

There are ways in which it could impact other users. If somebody at the upper end of the system were trying to improve irrigation efficiency and not have much return flow, downstream users would be impacted because they are dependent on that return flow. It was thought that the bill was tightly-enough crafted that it would not be possible. The proponent would have to demonstrate that there would be no other impacts. They would have to mitigate those by sharing a certain amount of water still going by. This apparently was not sufficient for other parties and this time the bill died. I think that we need to look at this for the future. I think that we will see it come back again next year. Essentially it's the agricultural equivalent of a municipal leak detection or a conservation program. If a municipality reduces leakage in a system, they aren't going to turn that water back into the system. They are going to utilize that for other uses. Agricultural users should be able to do the same thing.

Sara Duncan, Legislative Program Officer, Denver Water Board

Duncan: I promised my compadres at the Water Department that I would begin my remarks by disclaiming any prior knowledge on their behalf or any ownership on their behalf of what I am about to say. House Bill 1110 sprung onto the Legislative scene last year in such a way that we were able to talk about it on an on-going basis. Ultimately we opposed House Bill 1110 and by we, I mean a broad spectrum of water interest. In fact, House Bill 1110 offered the rare opportunity for the water community to work together. There were very few people in the water community who supported House Bill 1110. The reason for this really comes down to the issue of whether or not you can say that you have conserved water that was merely diverted and not actually consumed. People were very leery of this for the very good reason that when you deal with natural resources, and when you deal with a resource that cannot be substituted and is in limited supply, you need to have some predictability and certainty as you deal with this resource. It was felt that House Bill 1110 supplied neither.

Now, I should also say that the Water Department and the Water Congress and the water community opposition to House Bill 1110, hopefully did not stop there. There is also a commitment, I believe, on the part of the water interests, to look at the entire problem of water conservation in the agricultural area. This makes a lot of sense since agriculture is responsible for use of 89% of the waters that are consumed in Colorado. That, if in fact, we are to look at water conservation in a meaningful way that surely it has to include what we hope are our friends in the agricultural community.

The people that brought this bill forth, I think, are to be congratulated because I think they have created an on-going debate. I will also say that the House sponsor, Representative Tim Foster, from Grand Junction, has promised to re-introduce the bill. If it is the same bill, then I suggest to you that there are some legitimate concerns that need to be addressed before this can be supported. If it is a different type of bill, one which is more focused on the standards which are applied when water rights are changed, then I think that's certainly an idea worth considering.

So, finally, I would just begin by saying that the theme of this conference is translating environmental legislation into practice. I think that when we look at House Bill 1110 it points out some

of the good reasons why not all environmental legislation should be passed into law. We are given a chance to look at this legislation prior to the creation of a law. So, given that, I'll tell you that first of all I think that the topic of our little session is incorrect. It talks about marketing salvaged water. Unless we are dealing with water which is new to the system, water which would otherwise be lost to the system, that is not really traditionally been recognized as salvaged water by Colorado case law. And to the extent that we are dealing with water that is merely diverted and not consumed, then clearly this is not salvaged water.

Furthermore, I have been listening today to all the proponents of marketing water. It is still the same water. Water marketing may reallocate use of water and prioritize it in a way that may reflect its value to society and very well may not. Money does not always do that but water marketing certainly does not create new water; and if it did create new water, I can tell you that we would be most concerned because it would mean that somebody was enlarging a previously existing water right.

David is absolutely correct when he talks about the way water is used. The fourth way is seepage, which means that it's return flow. Once water becomes return flow, other people are entitled to appropriate it. The Colorado Courts have recognized this fact in a long line of cases, the most famous is the Shelton Farm Case, or the phreatophyte case or as somebody said, "Why in the hell don't you just call it the cottonwood case". Anyway, somebody came and cut down cottonwoods and said that these water thieves were taking all this water and now we have cut them down and we should be entitled to the water. The Court said, no, you should not be entitled to the water because you have not really created new water for the system. It was water that always tributary to the system. I think that what really made this a very fine distinction was that the applicants in this case and the cases that followed were asking for water rights outside the prior appropriation system.

House Bill 1110, I think, is very good in that it wants to keep the same priority date, as the date from which the water was "saved". However, the bill needs to be changed. It needs to be focused on historic consumptive use and not just on diversion. It's very clear, and has been for a long time, that just because you have a decree which allows you to divert so many cubic feet per second of water, it does not mean that you have ownership of all of that water. Ownership of water in Colorado is a usufructuary right, that means that you have the right to use the water. You get that right by appropriating that water, and you appropriate it by showing an intent and diversion and an application to beneficial use. It's this last criteria that is missing from this bill.

Just because you have diverted the water and it has helped carry the water to your crops, does not mean that you have applied that water to beneficial use. The decree holder does not have an ownership interest in that water. He or she does not have it under the Constitution. They do not have it under the case law and clearly they do not have it under the statutes. Because once the water is returned to the river, it can be used by other people. Further, if someone upstream has a water right and there is no longer the need to divert as much water downstream, then that upstream decree holder may well be able to use water that they otherwise had not been able to use, because there may not be a call on the river to bring all the water down, for example, down to the Cameo Call. In that instance, that

water is already appropriated.

This bill also has some procedural uncertainty as well as some uncertainty in regard to basic water law. In the bill, the owners of the decree need only to claim that they are going to effectuate a water savings in order to obtain a water right. I suggest that it is likely that any claim will bring out a hoard of statements of opposition, because no one will know exactly what that person is up to. Normally when you publish in a resume, when you are trying to get a decree, you have to put in specifics as to where the water is from, what it is a tributary to, how it's used, and usually what the consumptive use is if you know it, or certainly its traditional use. The applicant will also be required in court to show that there has been some consumptive use, and that is the water right that they can change or move around.

Finally, there is a real question as to whether or not this bill is needed. It is felt that under the change of Water Rights Law, if the bill is limited to consumptive use, that quite clearly, if you effectuate a savings, that you would be able to go ahead and move that water somewhere else, to sell and to move it. I suggest to you that House Bill 1110 creates a great many more problems than it would solve, and further that it is hopefully just a beginning and not the end product.

Merritt: I'll just take a couple of minutes to respond to points that Sara has brought up. One, the Shelton Farms Case, I agree very much with her using the Shelton Farms Case. I think that it's instructive to read from the very final paragraph from that decision, "No one at any river would be adverse to its connective and integrated system to developing this kind of water supply with control and balancing considerations, but to create such a scheme is the work of legislature, through creation of an appropriate district authority for the right of condemnation on a selective basis, not for the Courts. Until such time as legislature responds, action such as the appellant's should not be given Court sanction. Judgment is reversed." I believe that this last session of the legislature was the initial attempt to respond to what the Court requested in the Shelton Farms Case sixteen years prior. The Legislature does need to respond and come up with some strictures on it.

As to the beneficial use, the statutory definition of beneficial use is... "the use of that amount of water that is reasonable and appropriate under reasonably efficient practices to accomplish without waste the purpose for which the appropriations is lawfully made without limiting the generality of the foregoing..." Then it goes on to what else it includes for recreation. It includes the impoundment of water for recreational purposes including fishery and wildlife. The fact is that this is not beneficial use. I believe that they are currently using the water in the most efficient system that was developed, and will continue to use the water in that fashion. Just because a call has been placed on the river system and could, by some means of increased capital investment, be taken off, does not mean that somebody upstream or junior should be beneficiary of that investment. There is in all of these cases that I know, a very large capital investment required to make this water available. It truly is salvaged water, because it needs a capital investment to make it available. Under a continued operation, it would not be. In the final hearing of the procedural fact, we have tried to address the fact that you did have to show the ability to perform those improvements and actually would not gain that right until those improvements were

performed.

And as for your assertion that this legislation is not needed, the same arguments that said that this bill's objectives could be obtained under current statute also have been used to say that the current statutes do not allow this. The fact is that no competent water attorney, I believe, would subject a very senior water right to the potential for abandonment by going in and trying to say that they are going to perform these improvements and maintain ownership of the water. There have been a lot of very strong arguments that have come out during this past six months against that. I think the bill is very much needed.

Duncan: Actually the legislature did respond to Shelton Farms; they didn't respond necessarily in the way in which the Court had anticipated. The way that they responded was to add a requirement under plan of augmentation that nobody could claim water for augmentation which was saved by cutting down phreatophytes. That was their very limited response. I further point out that I think that the Court was very wise and ahead of its time in not encouraging the cutting of trees and filling of marshes in order to create water rights. In fact, they did environmental balancing, and their position on salvaged water is a result of this environmental balancing. Quite clearly, even though David Merritt contends this is not salvaged water, Shelton Farms and the Court in that case indicated that it was salvaged. This kind of savings through lining ditches was not salvaged water, and I will just re-do one phrase from the Shelton Farms Case where Justice Staves says, "...one who lines a channel with concrete, as is being done in the ... control project, without adding to the existing water is not entitled to a decree...." And I think that is very clear. Under the use of water that is occurring, diversion alone is not a beneficial use. In fact an early 1889 case, being the Farmers Highline Canal and Ditch Company, indicates that diversion alone cannot create a water right. It is the application to beneficial use that creates a water right. There is an over 100 year long line of cases that says that diversion alone does not create a water right. So you cannot really say that this diversion is a beneficial use.

It doesn't make any difference if lining ditches benefits somebody upstream or downstream. It's a Constitutional mandate that the right to appropriate shall not be denied, and if there is no call on the river, somebody else has prior appropriation right. That's the whole foundation of our system, that they will in fact be able to divert and apply that water to beneficial use.

I would like to say, though, that I don't think that we should stop where we are. I mean that I think that we really must look further into what is needed in terms of water conservation. The State of Oregon has a bill that is very similar to House Bill 1110 except that it requires that 25% of any water which is saved must be donated to the State for instream flows. That program has not worked well and the magazine entitled Rivers, and I think that this was in Volume One, looked at the Oregon program. It had been on the books for about three years at that time. There had only been one water right applied for, and one of the reasons was because the Oregon law did not take into account the need for return flow and the claims against the river on the basis of return flow, that conserving water could not stand alone without looking at the other appropriations of that water. Further there are compact calls that are

dependent upon return flow. There are many other things that are dependent upon return flow.

California also passed a water conservation law which made conserving water a beneficial use. This might be one way to look at what Colorado wants to do, although, once again they have had limited success at this. What they are trying to do is to keep the water from being declared abandoned. What I had suggested, and the more I look at it, the better solution I think it is, to look at the definition of "change of water right" in section 37-92.1-035 of HB 1110 and expand it to explicitly clarify that it would include water which would otherwise be lost to the system and had been conserved through some conservation method, but that it be dependent upon those standards that are presently within the change of water right statute that looks at historic consumptive use.

Question: First of all, Sara, you've talked about what happens with these savings, these efficiencies that may result and suggested that those are not owned by the water right holder in the first place, because his right is to consumptive use, and that those belong to the stream. Then it's appropriate for other junior users to get the benefit of that. Why should that be the case? Why shouldn't the seniors get the advantage of those efficiency savings? Wouldn't it be a good thing in a water short day to have that kind of incentive for people to implement efficiencies? If you don't do something like this, what do you see as an incentive for people to implement such efficiencies?

Duncan: You know I like the program better last year when the moderator was just neutral, when he didn't ask these type of questions. You know, I think that's a very good question, and the answer is probably not necessarily a satisfactory one, but it's true. That is that the Constitution forbids seniors from doing that and furthermore it forbids rewarding waste, and while the system when it was built was probably very efficient, it evidently is no longer efficient. However, that is not why the ditches are being lined; it's because of the salinity. The problem of the people in the Grand Valley is that they cannot take the water that has been diverted and apply it to other lands because it would increase the salt loading that Federal Government is trying to get rid of. In other areas, they probably could line the ditches and achieve some savings of their historic consumptive use. They probably would be able to take those water savings and apply them in other places and ask the Court to review their decree and review their use. So to answer the first part of your question which is why can't seniors do this, is because it's constitutionally prohibited, because it would create chaos in the water system, because people would not know what to expect in terms of return flow, because they want to do this based on diversion and not on consumption.

The second part of your question is, what incentives could be put into place? I imagine that as it becomes more difficult to build water storage projects, that the market will kick into gear in some instances, maybe not on smaller properties, but certainly on larger water rights. It would be in the best interest of the places where there is the most beneficial use, usually the metropolitan type of uses, to remove the water entirely, to line ditches and take the water in dry years, or to look at sprinkler systems which usually reduce evaporative loss so that there is some actual consumptive savings. I think that the

market place will dictate it. Beyond that, if the legislature wants to step in it can. I suggest that what they may want to do is to require some of these savings before water can be moved from rural to urban areas.

Question: Dave, you have suggested that this bill makes sense in precisely those situations where there is not a reduction in consumptive use but just by efficiency reducing the amount that's diverted. From what I remember about Colorado Water Law, consumption is the measure and the definition of a water right. Isn't your approach fundamentally inconsistent with Colorado Water Law in that respect?

Merritt: Consumption has become the measure of the water right; however, the actual measure is a beneficial use. In this case, a beneficial use is not just consumptive use, but it's the amount that's required to be diverted to meet that consumptive use. If we can come up with a more efficient method, shouldn't we? The amount of water in just this one area that is at stake is 50% greater than the yield of Two Forks. This provides us the ability to look at water development and water supplies in a new way. This is a departure from traditional Colorado Law; that's why it was opposed in many circles. But we can essentially develop new water supplies without having to build new storage. We can free up some of the water, essentially be able to take water out of agriculture without impacting rural areas.

Paul Frohardt: Are there questions from the audience? Ruth.

Ruth Hutchinson: I'm a shareholder in the Grand Valley Irrigation Company and part of the Grand Valley Unit of the Bureau of Reclamation of Colorado. Without their assistance, we wouldn't have become part of the salinity control program. Our canal, which is a major seeper has about one hundred miles of dirt ditch and is not a part of the program; only the laterals are. Bill McDonald, who was the Executive Director of the Colorado Water Conservation Board during the eighties act, has been trying to implement it and has been sole representative of the state to come to our irrigating entity in the Grand Valley to try to bring them on line to develop this program. The basis for the individual entities is that a non-federal entity will own, operate and maintain the laterals served by the units. In our company the laterals are owned by individual shareholders; they are not tied to the canal. The irrigation district is the same thing. The Grand Valley Water Users is a non-federal entity and the laterals are owned by the town.

Our shareholders are not enthusiastic about the program. They were asked in 1985 to change the Articles of Incorporation to allow the water canal company to own, operate and maintain the laterals. That's not part of our Articles of Incorporation. We went on for six years to try to overcome this. The Bureau tried very hard. We decided to have the canal company build a demonstration lateral in 1989. We would see what the procedure is going to be. The canal company, which never constructed anything on a private lateral, would build a lateral to show how it will work.

The lateral was incorporated; it was a private entity within itself under Statutes. The lateral

would have to assess its shareholders in order to be able to pay a base operation maintenance cost which is required by the salinity control program. They would pay the base cost based on a cost of expenses for maintenance every year. Most laterals basically have no cash outlay, and do the work themselves. At a canal company shareholders meeting, the majority voted to go ahead with the lateral.

A lawsuit was filed by certain shareholders saying that canal holders were acting outside their authority. The Bureau of Reclamation stopped all projects of a demonstration lateral and told our board of directors of the Grand Valley Irrigation Company we would have to go and have an article changed in order to participate in this program. Well, the vote to change the Articles of Incorporation came at a special meeting on Saturday. This change would allow the Irrigation Company to contract with the Federal Government on this project, pursuant to the Professional Control Act. The motion was defeated by the shareholders. It did not get two thirds majority, so basically the Irrigation Company is no longer in the salinity control project.

The laterals will not be done, our canal was never built. Our canal is not part of the program. Our canal sinks. We will continue to use it as we do because we have no inducement to improve it. We don't have to. It is the same as it was built in 1982.

There is a lot of room to do something. We need a benefactor and Tim Foster realizes that.

Somebody will help us get the capital to put this together so that we can start lining our canal and be a good neighbor, and that's where we are. To do this we need legislation that will enable us to retain full control of our water rights if there is a saving executed by improving our system. The Bureau has qualified the amount, and it could be up to over 15,000 acre feet a year. We will do it, but we don't have legislation.

House Bill 1110 that Mr. Foster proposed says that nothing in this Act shall authorize recognition of a water right, except tributary water by the eradication of the phreatophytes, and which would otherwise be lost to appropriative use in the State of Colorado. We happen to be the last appropriative user in the State of Colorado

Mr. McDonald of the Colorado Water Conservation Board at that time, came over and tried to review this. Basically the lawsuit was opposed and the Attorney for the Plaintiffs was asked what his understanding was of the savings of salvaged water in the State of Colorado. Under oath, Mr. McDonald stated that, I can't quote exactly, but under oath he stated and implied that he had three ideas of saving salvaged water, one was the phreatophyte removal, the second was due to changing the problems and patterns in agriculture, to cut down consumption and use, and the third was to improve the conveyance system so that there could not be diversion to the headgates, and the headgates did not have to be what it was in the very beginning. And that's where we are, and it's unfortunate, because we need help. The state needs help. This water can be used for the endangered fish. It can be guaranteed to stay in the original water right holder, and we can lease it for beneficial use to other parties in order to get use of our system.

Paul Frohardt: Thank you, Ruth, that was very helpful to have that explanation of the specific situation

that you have been dealing with that obviously generated a lot of this discussion. A couple of other questions quickly. Dave, there has been a lot of concern expressed that our current water rights system in Colorado is very costly from a transactional standpoint. It involves water lawyers and water courts constantly to the degree that, from what I understood that you said, that there may be fairly limited number of situations where this type of program, this type of legislation may have an application, basically where you don't have any downstream users who would be taking the water directly. What are your thoughts about what this might do to increase litigation and generally encourage new claims of this type, so that water users have a new round of getting their lawyers in court to defend against such claims? Does it make sense to take on that additional transactional cost burden, statewide to address what may be a fairly limited situation?

Merritt: Well, I haven't really heard a call from the Colorado Water Bar for a permanent system that would get the lawyers out of water courts. It doesn't seem to be a real big desire. I think there may be some increased litigation involved in this. I also think, though, that there are not going to be that many cases that are going to go forward. It's going to require an entity to look very closely at their water right. It's going to be very expensive for that entity, and they are going to be subjecting a very senior water right to potential limitations. They had better be very sure when they go in that there is a benefit to them and to the system as a whole. I don't think that there is going to be that many uses, and I don't think that it is going to overburden the Court system.

Duncan: Will you let me also respond to that? First of all I want to make it very clear that there is no beneficial use, there is no water right in diversion. So when Ruth Hutchinson talks about hanging on and keeping their water rights, that does not include this water that this bill tries to include. That is expansion of a water right. Secondly, even though there may be no downstream appropriators, clearly there could be people upstream who otherwise were not getting water because of the call and who now would be able to get water. So that even though there is a limited instance when you are at the tail end of the state's water system, if the call is reduced, there still may be other appropriators who have constitutionally and statutorily protected rights recognized by the Courts which will allow them to divert that water. There is no ability to claim a water right in water which is wasted, and to the extent that water is not wasted, then that water belongs to the stream and to the appropriator.

Paul Frohardt: Sara, let me follow up that with one more question for you. I think that there has been some implication that Dave touched on briefly in his remarks that maybe there is currently a double standard between agricultural uses and municipal uses. Agricultural uses have fairly clearly defined consumptive uses associated with the water rights and the municipalities historically have not. Maybe the large municipalities in terms of their actual consumptive use as result of diversion have been much more of a black box in terms of what actual consumption takes place. Do we currently have a double

standard where it's unfair because municipalities can take steps to encourage efficiencies and thereby serve more customers which results in more consumption whereas the agricultural users do not have that benefit?

Duncan: Well, the answer to that is not quite as easy as I would like it to be, certainly no water right holder, be they a municipality, or a farmer or an industrial user can expand their water right beyond, what has been decreed at least for municipalities. There are always other municipalities watching to see how you are using your water. There is, however, a doctrine in Colorado, and this applies more to abandonment, that makes it much harder for a city to abandon its water right than it would be for example for a farmer. Under the idea of great and growing cities, a city may not use its water for several years and still not have that water right called abandoned. Whereas if a farmer does not use his water right for ten years, then it is presumptively considered abandoned, and put on the abandoned list, and he has the burden of proving that he or she has not abandoned this water right. So there is a judicially, and I think even statutorily, recognized double standard.

As to water which is conserved and the water right, you certainly cannot expand the water right no matter where you are. I would also agree, though, that I think you are correct with the information as to the water consumption within the city is certainly not as clearly defined as it is on certain very specified pieces of agricultural land, and to that extent the proof is very different.

Paul Frohardt: I think that you all have seen this very challenging issue and I think that Dave and Sara have done an excellent job of fleshing out the various sides of the issue, and I'm sure that it's one that we'll all be grappling with for awhile.

Debate: Non-point Pollution Control and Hydrologic Modifications

Larry Simpson

Manager, Northern Colorado Water Conservancy District

Lane Wyatt

Engineer, Northwest Colorado Council of Governments

Moderator: Lee Rozaklis, Hydrosphere

Lee Rozaklis: What we would like to do in this debate is to adopt a point-counter point format. I'm going to ask each of these two gentlemen to respond to series of questions. They are going to focus on some of the areas of continuing uncertainty as to how to proceed regarding non-point source pollution and hydrologic modifications. We'll ask their opinions as to how we should go in these directions. I would like to start off with just sort of an informational question to get rolling, and I'm going to ask each person to respond, to lead off the response and the other one to follow. First question to Larry. How do you see the terms non-point source pollution and hydrologic modification relating to each other? What is the relationship between these two?

Larry Simpson

Manager, Northern Colorado Water Conservancy District

One of the difficulties of being this late in the evening is that you would like to rebut everything that has been said all day, but I'll try to stay away from that aspect of it. I think that in my mind I've read both sides of the legal arguments by some very good attorneys on whether pollution means the addition of pollutants or if pollution means ecological control downstream and water quantity control downstream. Rather than getting into the legal arguments, one way or the other it appears to me that we have a problem in the state of Colorado, and other places, but primarily in Colorado, that needs to be solved.

There is in fact pollution or the addition of pollutants associated with reservoirs that can be measured, that can be managed with best management practices. There are things that a reservoir does. It adds temperature, or decreases the temperature to the stream beyond what it was in the past. There are dissolved gas problems, and there are nutrient problems in some circumstances. All of these can be dealt with reasonably with management practices and in an economical way. However, the question of whether removal of water from a stream, along with the attendant affects downstream of minimizing or lowering the stream flows, is a pollution from a hydrologic modification, I think is a real strong question. My position here is that even if there is a question legally as to whether that is a pollutant or not, there is still a problem down there. I think that it behooves everybody to try to figure out how to deal with

that problem. So I think that my point is that hydraulic modification or hydrologic modifications, as they now use that buzz word, do in fact create, in some instances, pollutants to the water. Those need to be addressed and can be addressed. The question of whether or not removal of the water is in fact a pollutant is a hypothetical question and the problem of downstream changes needs to be dealt with. One of the concerns I have is that frequently these terms are utilized by people who aren't really interested in the water quality themselves. They are interested in stopping something upstream or have another agenda. That's where we run into real problems.

Lane Wyatt
Engineer, Northwest Colorado Council of Governments

I have just one preliminary comment, so that I won't disappoint anybody, and that is relative to the format here that most of the other debates have been what might be represented as a development community countering with an environmental interest, and I just wanted to be clear that I don't represent an environmental organization. I work for an organization of thirty-two local governments that are as diverse as Aspen and Walden, and these entities deal with issues like water development, timber development and promoting recreation. I think that the theme that they try to bring out in most of their policies is that theme that was the original topic for Mr. Hobb's and Mr. Reisner's debate. We have to balance water use with environmental protection.

Back to the question about how the two terms of non-point sources and hydrologic modifications relate, I think that the definitions of these terms have pretty well been laid out legally and otherwise. Hydrologic modifications are a non-point source of pollution just like urban runoff is. The definitions are found in places like the State's non-point source management document and the EPA's guidance documents for non-point sources. I think in addition that Congress recognized the need to address hydrologic modifications when it was drafting the Clean Water Act, when it directed EPA to issue guidelines to control pollution that results from "...changes in the movement, flow, or circulation of navigable waters including those changes caused by construction of dams, levies or flow diversion facilities." So what's being done now is that management programs are being put together to protect the uses of our water, such as aquatic life, from the impacts of non-point source pollution.

As a practical matter, whether hydrologic modification is non-point source or point source or something completely different, it doesn't really matter. We regulate other polluters such as industrial discharger because they are harming uses like aquatic life through their discharges of contaminated water. I'm not sure how that is substantially different from an appropriator whose diversion is harming fish by reduction in necessary flows. In one case you have a diverter that is suffocating a fish and in another case you have an industrial discharger that's poisoning it. I'm not sure that there is a real legal or logical difference there.

Finally, I think the relationship between hydrologic modifications and non-point sources really

shouldn't be an issue to the water development community. I understand that Bennett Raley recognized this, this morning, because discharges from dams have been identified as a non-point source, and of course, dams are hydraulic or hydrologic modification. What's ironic, I think, is that some of the people that were arguing that hydrologic modifications should be considered a non-point source are some of the folks that are now trying to argue that we shouldn't deal with some of the impacts of them under a non-point source management program.

Rozaklis: What are your thoughts on the issue of responsibility? How should responsibility for the water quality impasse, with hydrologic modification within a given river basin be addressed? Should this change be based on whether or not there are other sources of point and non-point sources pollution within that basin?

Wyatt: We've heard a lot about responsibility today. I think that responsibility is really the heart of the controversy that surrounds hydrologic modifications. I don't think that there is really any debate as to whether changes to a stream that could be caused by hydrologic modification can result in impacts to a stream ecosystem and the associated water quality. Karen Hamilton gave some examples of those kinds of impacts, increases in temperatures, loss of sediment carrying capacity, those kinds of things. The real debate is whether a water developer who causes these changes should be immune from these responsibilities simply because the impacts are the results of their exercise of water rights. Associated with that is whether or not they should participate in the mitigation of the water quality impacts associated with the exercised water rights.

I think maybe the reason water rights are given deference is because they are property rights, but other property rights are affected by efforts to control the other categories of non-point sources. I would like to give you an example of how the issue of responsibility is handled in an agricultural setting.

Consider a farmer who has a property right in his land as a result of developing that right by growing a crop or raising cattle. Water quality may be impacted in this example. Although not required to, farmers are putting in different kinds of management practices to protect water quality. This is carried out under the traditional approach of SCS. Many of those practices, such as a grass filter strip, can limit their property right by taking some of their land out of production in order to mitigate water quality. There isn't a controversy over the agriculture program that there is over the hydrologic modification program.

Now let me expand this just a little bit. Let's assume that in addition to the farm, there is a small municipality in our hypothetical watershed; the municipality has put in practice best management practices in the form of land use ordinances. These are intended to reduce erosion, let's say, grading types of ordinances. These BMP's result in increased costs to landowners when they try to develop their property.

Let's go another step further. The small municipality has a storm water treatment system and has utilized advanced treatment for its wastewater discharge. Now all of this comes to considerable cost to the citizens of the watershed, but the streams and water quality have been protected. Now along comes

an appropriator who diverts upstream water for some use out of the basin. The result from this activity, in this hypothetical situation, is a loss of aquatic habitat and maybe increased concentrations of ammonia in the remaining stream.

Now neither the farmer nor the municipality have made any changes in their systems. Should the new appropriator pass responsibility for his impacts back to them because his activity did not result in the discharge of pollution although it clearly altered the physical, chemical and biological integrity of the stream? In this case isn't the appropriator a polluter? There are other examples where the appropriation really is a source of pollution. The Northern Colorado Water Conservancy District has experimented with what I think is a very insightful practice called an irrigation management system. Through extensive evaluation of factors related to soils and crops, they found that crop yields can be maintained and nitrogen pollution in tail waters and ground water can be substantially reduced by reductions in the application of irrigation water in the neighborhood of 50%. I think I heard Dan Parker say in some cases as much as 90%. In other words, once you supply sufficient water for the crop system requirements, using additional water results in pollution. The actual diversion and application of water is the source of pollution.

This situation bears a striking resemblance to an industrial discharger who diverts water into his facilities and then returns polluted water as a result of that use. The difference, though, is that in the case of the industrial discharger, the private industry is responsible for paying for the impacts, or paying for the treatment costs to avoid the impacts to the receiving stream. However, in the case of the appropriator, if there are impacts, generally the public will have to pay. So back to the question of who is responsible. I feel that anyone whose activities result in negative impacts to water quality is responsible.

Simpson: Once again, I don't disagree with what you are saying, but once again, every example you gave was of somebody adding pollution to a stream. The fact is that the Clean Water Act deals with adding pollution to a stream. There is no question in my mind that that is what was dealt with. The fact again is that if you are dealing with a quantity of water in a stream downstream for other purposes, whether it be a dissolution of pollution or whatever you want to call it, there are plenty of other acts, plenty of other regulatory, to quote Melinda, "hammers," that's the favorite of environmentalists, now...you know we've got to have a hammer, "If I had a hammer...." Fact is that the hammers are there, they are there in the Clean Water Act, 404, 401, Reclamation Reform Act, Fish and Wildlife Coordination Act, Endangered Species Act, 1041, you have more hammers than you have hands to use them. The fact is that the Clean Water Act is there for one purpose; it's there to prevent people from adding pollutants to the streams, whether it be temperature changes or whatever else. If you try to misuse that act and broaden it to try to give the environmental community another hammer or to satisfy an agenda, which may be to stop a project within your drainage, I guarantee you it will come back to haunt you, because that hammer can be used just as easily in this basin against your own uses as well as against the developer. And as a consequence, you'll find that BLM's grazing permits, "Cattle Free by

'93" all of these processes fit an agenda, and that agenda (incidentally, I have a very interesting internal paper from EPA which spells out an agenda) includes non-point source pollution. It includes developing biological integrity in streams through the use of the Clean Water Act. It involves the elimination of "double subsidies" or breaching of the Federal contracts that were made for many years through the Reclamation Reform Act. There's a nice agenda spelled out there; every one of these things falls into that line, and believe me, trying to extend the Clean Water Act to include the control of the quantities in the streams or minimum flows downstream will come back to haunt you.

Rozaklis: If we get into controlling non-point source pollution, we apply that definition to hydrologic modification as well. How should the notion of best management practices be applied to hydrologic modification? You've heard it discussed in terms of things like agricultural runoff and urban storm water runoff. How should BMP's be applied to hydrologic modification?

Simpson: There are more limited ways that you can do that, but trying to release water in such a manner that you don't modify the stream temperature, the dissolved oxygen content or the nutrient loadings on the streams downstreams can be done, in many instances, without retrofitting the dams. Aeration structures downstream can be installed in order to solve some of the oxygen problems to prevent the fish from suffocating. There are many things that can be done. In a new project there is no question that there are a number of things that can be done in the design of a project to prevent adding pollution, if you will, to the stream and to prevent detrimental impacts downstream. Those can generally be added without a great increase in cost. Retrofitting existing projects, particularly putting in multi-level outlets and things like that, can be very expensive.

The question of who pays and who is getting the benefit out of it needs to be addressed too. You don't change horses in mid-stream, as I mentioned before. The Federal Government signed a lot of contracts back in the '30's that they are trying to modify or are being modified for them by legislative action in order for them to accomplish a totally different agenda. I think that cooperation, working together and trying to really perceive what the real problems are, rather than trying to use these things as hammers to stop another project, will result in modifications in operating schedules, and various other things, as long as you don't impact the yield of the project to accomplish these purposes. I think that working together with an open mind and without a hidden agenda will accomplish an awful lot.

Rozaklis: Lane, Larry suggests lists of BMP's that don't go so far as to modify yield, but look at actual problems to be addressed. What's your view on this? Do you go along with Larry's notion of applying BMP's to hydrologic modification?

Wyatt: For the most part I think I'm going to have to agree, but since I know that we're not here to agree with each other, I'll try to put it in another context a little bit. The end result is the same, though. I think it's unfortunate that in our efforts to develop a voluntary management program for hydrologic

modifications in Colorado, we were unable to even use the term best management practices in the consideration of hydrologic modifications. I think it's too bad that this fear of cross compliance and other things has come up, because I think that we have really lost the opportunity to evaluate a lot of creative techniques that could resolve water quality impacts without unlawful interference or injury to water rights. It's unfortunate in this process, that a lot of it was driven by legal concerns, and I have to wonder if maybe the public might have been better served, if some of the money that was spent on legal advice might have been spent well on psychological counseling for paranoid delusions or something like that.

Actually I never thought that attempts to develop a state's hydrologic modification program would become a topic of a conference like this. I never realized that it would go that far, but I would like to say that early in the process we tried to figure out different kinds of best management practices, the kinds of things that Larry has mentioned and then some other ones that maybe go a little further. But none of them were really as sophisticated as the Northern District's irrigation management system that I mentioned a minute ago. I think that the kinds of BMP's that we were looking at were mostly just a listing of tools that someone might just want to look at in applying to their specific situation. But what is important in the development of this is that a process for applying these BMP's was also developed to make sure that the concerns associated with their use were considered before they were implemented. As Karen mentioned this morning, that's really what remains of the management programs for hydrologic modifications. I think that it was recognized that typically water quality impacts from hydrologic modification are a result of interactions between a lot different kinds of sources, both point and non-point sources.

A process that considers these interactions will help to facilitate cooperation in hopes that we'd be able to develop solutions. Such a process was put together with the BMP's outlined and incorporated into a management plan that was really replete with protection for water rights. I think that this is the kind of thing that will work well as a management practice, and it also helps you begin to look at the kind of technology that is readily available to protect water quality.

Rozaklis: We've heard about BMP's applied to most non-point types of pollution as being done in a voluntary nature. Dan Parker pointed out earlier that what we should do is give those practices time to show how they benefit the farmer, benefit the water user, and this voluntary compliance may actually yield very positive results. In the case of hydrologic modifications, I don't know that this model applies so much. Many of the measures that Larry and Lane mentioned may come at some cost. The question is how vigorously should BMP's be pursued for hydrologic modifications? Is voluntary compliance enough or do there have to be some carrots, some incentive in there? Do there have to be some sticks, some regulation aspect to it? How vigorously should BMP's for hydromods be pursued?

Wyatt: I would like to think that we can avoid regulations. I think that when you start developing regulations, there are always questions about how they are being applied, and the resolution of these kinds of questions always seems to result in conflict. Also, what seems to happen is that you end up with some

kind of stiff regulatory parameters that really don't address the problem. I think that Dan Parker talked about this in the SCS situation, but I think that regulations are typically mandated when people refuse to take responsibility. The grant incentive/education approach seems to be working well in the areas of agriculture, mining and silviculture types of impacts. I really hope that the people involved in hydrologic modifications can follow that example. I think that it gets down to, and Bennett Raley brought up this morning, who's going to make the decisions about this. I really hope that we'll be able to keep those decisions at home and not have them fall into a regulatory framework.

Simpson: Well I think that I would have to agree with Lane's earlier comment about spending money on lawyers. Frankly, to answer a question in the previous workshop, if all the money spent on the Sierra v. Block, et.al. suit by the United States had been used for water rights acquisition for the minimum flows for the wildernesses, the wildernesses would be a lot better off than they are today. I do believe, however, the voluntary approach, the present approach, works well without regulation.

Let me cite a specific example. When we developed the Windy Gap project, we agreed to cease any pumping when certain minimum flow requirements were not met at various points downstream. That was in fact, a hydrologic modification and was dealing with the concerns we're talking about here. We also agreed to pay a sum of money to the City of Hot Sulfur Springs for the improvement of their water supply system and their waste treatment system, based on this same area. We provided a sum of money to Grand County for use in examining their water quality problems upstream. We did a number of things. We agreed to monitor temperature below the reservoir and to use two multi-level outlets to assure that temperature did not vary from what it had in the past, and we have been able to successfully do that.

That was a system where there was no regulatory process. It was a part of a negotiation, the give and take, a meeting of people that were willing to sit down and discuss an issue. There was obviously a stick in it. There is a stick in the Conservancy Act that says that we develop our projects in such a way that they don't harm those downstream. Those provisions primarily go to water rights. This is the first time that there was a situation where minimum stream flows as appropriated by the State Water Conservation Board were in fact honored.

We agreed to subordinate to those instream flows; we in fact have met that requirement. We did a number of things in that process, and I have a hard time believing that any water resource project from this point forward, given all those regulatory hammers that are already out there, won't have adequate mitigation in these areas resolved. There will be adequate mitigation without any mis-use of the Clean Water Act in a way that was never intended.

I think that we see an agenda in the Federal Government today with a Clean Water Re-authorization where they would like to retrofit the Clean Water Act to be an Environmental Quality Act for the United States. Nothing to do with water. An Environmental Quality Act. I think that is very obvious in seeing the Baucus Bill, some of provisions that were put in that Bill. It seems to me that everybody is in the regulatory mode or are trying to add pieces to the Clean Water Act to give them another hammer, and I just don't think that's the way to do business. We've never done it that way, and

frankly we get along pretty good with it.

Rozaklis: I'd like to ask each of you to sum up. I've heard a lot of common themes from the two of you regarding how to proceed with implementing attainment of clean water goals. Number one, let's try to keep the decisions at home. And let's try to keep the lawyers out of it. I've heard a description of the Windy Gap process as maybe something of more of a model. How do we proceed in implementing this, especially when you are dealing with water projects that may not be subject to the Water Conservancy Act? And how do we deal with existing projects that may certainly be a factor in water quality in Colorado? Do you have any thoughts as to how we go about obtaining our non-point source objectives? Do you have any ways of initiating discussions that maybe we should be pursuing as a state?

Simpson: Well I think that the days of drying up a steam are over, have been for a number of years, probably many, many more years than the proponents would like to admit. I think given the land use requirements, land use restrictions, and water rights restrictions, the changes that have adapted themselves through the appropriation system through the needs of the community in this region are going to force this cooperation. If anybody wants to build a water project, and I'm speaking here of a development, they are going to have to sit down at the table and meet with those people who have concerns about it. That's just the way things are today. I don't think it's a question of whether, I think it's a question of doing. I think we've seen recent examples, although they may not have been pursued as far as they should be, and the projects are no longer viable. I think that the writing is on the wall, that we have to sit down and work together. The fact is that those of us that are in the water business are in a business of trying to provide a stable managed water supply to the citizens in the State of Colorado. We have the same interests, the same constituency, and we are going to have to meet the needs of the constituencies in both environmental and water supply areas. I think it means just sitting down at the table and discussing it. I think that's just the way the world really is.

Wyatt: Well, I'm glad to hear that the days of drying up streams are over, and I'm sure that a lot of people in Gunnison County are glad to hear that too. I am especially glad to hear this since I come from a place where most of the out-of-basin diversions come from, the headwaters of the Colorado.

I had a couple of comments on some of the points that Larry brought up. One of them is in regard to this thought of an Environmental Quality Act versus a Clean Water Act and then, of course, the concept of adding pollution. Earlier, I mentioned beef production as an example of a land use that may result in a water quality impact. I know that there is a lot of talk now that cattle may be responsible for enough methane to put a hole in the ozone layer, but I think that it may be stretching it a little too far to call it a point source. As far as the environmental quality regulations, I think that we are moving that direction a little bit, and I think that recognizes the values that are being put on the table. I don't particularly think that the Town of Vail, for instance, would be particularly happy with distilled water running through a pipe through their community as a good measure of good water quality. I also think

that what we're talking about is a control of a non-point source, and like other non-point sources, what we're talking about is trying to do a lot with a little, using low technology to try to combine the effects of everybody getting on the wagon and trying to provide a solution. What it entails, I think, is everybody taking responsibility for themselves and directing that toward good water quality. It's an expensive proposition, but I'm very much a student of optimization, and I think that the only thing missing in the optimization equation is that water quality hasn't been one of the criteria that needs to be considered when we are optimizing things like yields.

Question: I have two small questions. Larry Simpson, would you describe that irrigation management project that Mr. Wyatt talked about? And the other is how do you control temperature? You were saying how you checked temperature below the dam.

Simpson: Our irrigation management scheduling programming, I think this is a crown jewel that began about ten years ago, and has frankly blossomed into one of our premier efforts. On a voluntary basis, we have agronomists and agricultural engineers on the staff that have put together a program where they go out and show the farmers how they can put things like soil moisture gauges and gypsum blocks in their fields, so that they water the crops when the crops need the water and not when they feel like it. We had some demonstration programs where we showed farmers that in their initial irrigations they frequently washed away or leached out some of that very expensive fertilizer that they had added earlier in the spring. The minute they saw that in the picture of dollars, the fact that they could raise just as good of crops and irrigate in a different way, most of them have moved toward adopting that.

We have tried to provide that on an expanded basis. We actually have gotten to the point now where we have a long waiting list of farmers waiting to go onto the program. Our position is we will allow a farmer two to three years to see what happens. We show him how to irrigate, and give him evapo-transportation data. We have satellite reporting weather stations throughout our area so that we can provide evapo-transportation data on a daily basis. After 2-3 years, he's on his own, but we've shown him that he will save money, get better crops, and primarily use a little less water in the process. He then buys his own equipment, and does it himself. It has been a tremendous program, and the results have been far beyond my imagination.

Your second question was how do we control temperature in Windy Gap Reservoir. We have two different reservoir outlets, one at a higher level and one at a deep level. By monitoring these outlets, we can actually vary the temperature of the water because the deep water is colder, surface water is warmer. We try and maintain the temperature that we recorded before we built the reservoir. That's maybe a little bit of a crap shoot, because you don't know what it was over a long period of time. In low flow periods it probably was a lot warmer. We do have a gold medal fishery downstream. That gold medal fishery is there because the Granby Reservoir was built, and we don't have those major flood flows that scour away all the gravel beds and everything every year. Since the Granby Reservoir was put in, the Division of Wildlife has developed the gold medal fishery in that stretch between Windy Gap

and the Kremmling, or the mouth of the Blue River. By maintaining the temperatures that the Division of Wildlife feels are necessary to keep the right kind of bugs alive, we continue to have that gold medal fishery. It's just a question of people talking together and using methods that didn't cost anybody anything. That's kind of how it has worked.

Question: This question is for both Larry and Lane. You both have talked about responsibility, and I think that I sense here is that there is a lot of desire to let someone else take the responsibility for doing our enforcement for us on our behalf, having EPA or the state or somebody else enforce for a city. How difficult now is the strategy of perhaps waiting and seeing what happens? Cities in particular have a lot of water quality battles. I'm wondering how difficult it is to wait and see what happens if a diverter reduces quality of water on a stream and then you take the diverter to Court on a nuisance for something like that. I know one of the difficulties is establishing proof of who is responsible, but maybe we could do some things to make that possible, encourage individuals to try to take responsibility for enforcement of injuries against themselves.

Simpson: First of all, I agree that we don't need the federal government coming in, Big Brother, watching over us any more. I really question that if there is a demonstrable problem, can't it be worked out by entities working together without going to the courts? Sometimes you have to use the courts to get somebody's attention in order to bring them to the table, that's the real world too. But I'm firmly convinced that bringing in a federal entity to regulate the process or to use one of those federal hammers, frankly, is going to end up working toward the detriment of everybody involved. I've never seen a federal hammer yet that didn't have such a broad swipe to it that it got everybody in its path.

Rozaklis: You are suggesting that individuals would be able to initiate enforcement action? Is that a possibility? I just want to clarify that.

Question: I'm suggesting that perhaps individuals might try to initiate this action. My understanding is that it would be difficult in terms of establishing who, why this happened, and cause and effect of the relationship. My understanding is that these approaches to these kinds of problems might be rather powerful and might be a way of perhaps dealing with some of these, and I haven't heard much discussion about that kind of alternative.

Wyatt: For what it's worth, Grand County had a similar thought during the 401 rule-making hearings for the Two Forks Reservoir. They asked if the Water Quality Control Commission would consider a condition to their certification that would allow for an updating based on monitoring requirements. If it turned out that there were impacts then they would re-open the 401. I am not familiar with how it would be implemented, but it was rejected. So from the State's standpoint that avenue doesn't appear to be open based upon this precedent, but I don't think that anybody has really pursued the idea of a

nuisance.

Simpson: I don't know that I could give you any kind of a legal opinion with regard to nuisance law since I'm not a lawyer. I have been accused of practicing enough. Someday maybe I'll be one.

Public Policy and the Management of Western Water

Daniel Kemmis
Mayor, City of Missoula

I grew up on a farm in eastern Montana where my experience with water was basically an experience with the lack of water. There was a little crick that flowed through the farm. Flowed was not exactly the right word for it. Maybe twice a year something flowed in it, and when it did, it would flow down to the East Redwater and then finally into the Redwater, which is an occasional tributary to the Missouri River down below Fort Peck Dam.

When I got to the legislature, in my first session, I was asked to serve on the select committee on water policy. I was always puzzled by why that was. And as my legislative career developed, and I continued to be asked to serve on water committees, I finally decided it was because, as someone who had grown up with basically no experience with water whatsoever, that it was thought that I probably didn't have any prejudices about water one way or the other. And for whatever reason, I was always glad that I was given an opportunity to get to work on water issues.

I came to think of myself as a kind of water groupie because everybody that I was working with knew something about water; I never did, but I was involved in kind of continuous education about water issues which still seems to go on. As I got into that work, I came to appreciate more and more that little aphorism of Mark Twain's about the importance of water in the West when Twain finally concluded that "whiskey's for drinking, water's for fighting." And it seems to me that that's very much the history of water policy in the West.

I have had an opportunity to see an awful lot of litigation, an awful lot of contested case proceedings and so on throughout my career, as I think most of you have. I actually was involved in some of that myself for quite a while. I was trained as a lawyer and I practiced law for several years. I now usually refer to myself as a recovering lawyer.

One of the things that I came to believe more and more strongly about our contentious way of doing business in public policy in general, but especially in the area of water policy, is that that very contentiousness undermines the public interest very severely. And that the ways, the multitude of ways in which we manage to divide ourselves over water policy, means in the long run that we are worse off than we might have been otherwise. For me, at least, that has come to be a deepening concern, and as I've watched the development of water policy over the years, and as I've attended conferences like this, I've come to believe that there is a gradual turning away from the basic contentiousness. And believe me, I am not naive enough to think that we have anything like put it behind us or that we're ever likely to do that. Yet, I think that we are moving toward some kind of a new paradigm of handling water issues. And I think, quite frankly, that the changing faces that I see at conferences like this, are an indication of the fact that we are very slowly moving in a new direction as far as water policy goes. Quite frankly, after being involved in this for some twenty years, the mere fact that we are finally

beginning to see some substantial number of female faces in crowds like this, is itself an indication to me that there is the development of a new culture in this area. But in order to get at what that might all be about, I'd like to suggest to you just a couple of signals, to me, that there has been something deeply wrong with the way that we do public policy in general, and especially water policy, in this country and particularly in the West.

It seems to me that because of this thing that is deeply wrong, we end up not only with worse policy than we might have, but we end up with deeply alienated people who increasingly believe that our procedures, our ways of being public, do not satisfy what being human is all about to them. And it seems to me that it is this problem above all that drives people away from public life, that makes them dubious about public life, and cynical about public life. And so, because we do not do public life very well, I think that we undermine our democracy in some serious ways. And we all need to be concerned about that.

I'd like to suggest a couple of ways in which that our way of doing public policy is far from being as sensitive to our human needs as it might be. I'd like to begin by reading to you a quote from George Will, who is describing essentially the way that we usually make public policy through contested case proceedings. What Will is talking about here is the way we use especially public hearings in order to arrive at public policy. I want you to think of your favorite example of a public hearing as you listen to what Will says here in describing what he calls the "good society under the public hearing model."

Will says, "A good society is remarkably independent of individuals willing the social good. A good society is a lumpy stew of individuals and groups, each with its own inherent principle of motion. This stew stirs itself, and in the fullness of time, out comes a creamy puree called the public interest." "This," Will says, "is the Cuisinart Theory of justice. The endless maelstrom of individuals pursuing private goods produces, magically, the public good."

Well, it seems to me that there's a real signal there about the way that we have gone about democracy in this country, that we have not put on citizens very much of a responsibility for thinking about the public good. What we hold citizens to, basically, in the contested case public hearing model, is a responsibility to present their own interest. And then we create this machinery which somehow, as Will says, is supposed to magically create the public good. I think that most of us who are involved in that process know that there's something wrong with that, but perhaps more important, most of the people who are drawn into that process only occasionally, who are drawn in as contestants in public hearings, know deeply that there is something wrong with what goes on there.

And now I'd like to shift the attention to another way in which I think that our way of doing, of being public, has gone astray. And this will seem to be totally unrelated to what George Will has talked about, but hopefully we'll be able to weave it together as we talked about public policy in the arena of water. I'd like to quote now from one of my favorite authors, Wendell Berry. Berry is talking here in The Unsettling of America about what he sees as the essential placelessness of the American experiment in inhabiting a continent. This is what he says about that:

One of the peculiarities of the white race's presence in America is how little intention has been applied to it. As a people, wherever we have been, we have never really intended to be. The continent is said to have been discovered by an Italian who was on his way to India. The earliest explorers were looking for gold, which was, after an early streak of luck in Mexico, always somewhere further on. Conquests and foundings were incidental to this search, which did not and could not end until the continent was finally laid open in an orgy of gold-seeking in the middle of the last century. Once the unknown of geography was mapped, the industrial marketplace became the new frontier, and we continued with largely the same motives and with increasing haste and anxiety to displace ourselves. No longer with unity of direction, like a migrant flock, but more like the refugees from a broken anthill.

Well, that's a kind of damning indictment, and I'm sure that many people would say that that's not been the whole history of America, and Berry himself goes on to say that's not been the whole history. He says that there have always been people who say, no further, this is the place, this is enough. But still, the basic kind of restlessness, the sense that there was always someplace else to be, and that we were not really here, we were not really in the places that we had come to inhabit, is, perhaps, something that we need to take account of. I think in many ways that it helps us to understand the history of water when he refers to the history of gold-seeking. He refers, of course, to the beginning of the prior appropriation doctrine, and I think that it's interesting to think about the differences between the prior appropriation doctrine and the Winter's doctrine, which is a deeply inhibitory doctrine. The Winter's doctrine, which says basically, the question about water is how much water does it take to sustain a civilization in this place? That's the fundamental question of the Winter's doctrine. It is nothing like the fundamental question of the prior appropriation doctrine.

But allow me to quote further from Berry, because I think that he does a good job of thinking about the kinds of things that many of us take for granted. Berry is also critical of environmentalism. And he's critical of it in this way, that there's a sense in which environmentalism is also divorced from a basic understanding of what it means to inhabit a place. This is how Berry speaks of that. He says,

The concept of country, homeland, dwelling place, becomes simplified as the environment, that is what surrounds us. Once we see our place, our part of the world as surrounding us, we have already made a profound division between it and ourselves. We have given up the understanding, dropped it out of our language and so out of our thought, that we in our country create one another, depend on one another, are literally part of one another, that our land passes in and out of our bodies just as our bodies pass in and out of the land. That as we and our land are part of one another, so all who are living as neighbors here, human and plant and animal, are part of one another, and so cannot possibly flourish alone. That therefore our culture must be our response to our place. Our culture and our place are images of each other, and inseparable from each other, so neither can be better than the other.

I think that there is something about that way of thinking that probably rings a bell with most of us here, whether we call ourselves environmentalists or whether we call ourselves farmers and ranchers. There is a sense in which we feel that there is that essential connectiveness to places, that we cannot define ourselves apart from the places that we inhabit. And yet I would suggest that in most of the forums that lead to the way that we make public policy, that that fundamental human sense of connectiveness to place is given very little scope for expression.

What I want to argue is that in a strange kind of way, that the problems that both George Will and Wendell Berry, an unlikely combination, identify, are problems that are built into the very political fabric of this nation at its founding. And that in the decision to be a nation, that we made some fundamental decisions about the way that we do public policy that continue to haunt us. And unless and until we are willing to stop the flag waving, to stop assuming that what bicentennials are for is to congratulate ourselves, and to remember that where this nation came from was an essentially critical attitude toward government, an attitude that said, what we're up to is figuring out how to do this well. Until we're willing to question some of the fundamental premises of the founding of the nation, the problems that we deal with, in water policy and in many other areas of policy, will continue to be with us.

So I'd like us for just a very brief moment to go to back to Philadelphia in 1787 and to think about some of the basic decisions that were made at that time that have lead to the kinds of problems that both Berry and Will identified. If you read the Federalist Papers, penned mostly by Madison, you will find there a definition of what the nation was all about that contains the germs of these problems, very clearly. One of the problems that the nation faced at its founding was the problem of faction, of what was to be done to guarantee that the agriculturists and the commercial interests, that the slave holders and the abolitionists, could somehow be brought together in the formulation of public policy. And there were really two thoughts about how that could happen. One of them had to do with what was called republicanism, with a small "r", for which Jefferson was a great proponent. And basically what would have happened there was that people would have been brought together and said, ok, here's the problem. How are you going to, in some kind of face-to-face way, solve it?

The other solution, which you find propounded by Madison, is essentially the Cuisinart theory that Will talks about. It essentially says, the factions cannot understand each other. They cannot really work together. And the best you can do is create a system of government, a very complex system of checks and balances, that will guarantee that no one of those factions will ever get the upper hand over the other. That system of checks and balances has, I would say, resulted in the proceduralism of our time. It has resulted in the politics of the contested case hearing, of the public hearing, which people find so terribly frustrating.

The other thing that we find with the establishment of the nation is another argument that Madison made about how to overcome what they called the tyranny of the majority, the fear that some one faction would get the upper hand. Republicans had always argued that in order to govern themselves well, that people had to govern themselves in small units, where they could be face to face with each other. Where

they could confront one another and hold one another responsible for taking care of the public good. But Madison's argument in the Federalist Papers was exactly the reverse. He did it in this way. He said that in fact, an extensive territory was the surest way to guarantee that no faction would ever get the upper hand. And listen carefully to the argument that he makes about why that was said. He said that if you extend this territory, and you take in a greater variety of parties and interests, you make it less probable that a majority of the whole will have a common motive to invade the rights of other citizens. Or, if such a common motive exists, it will be more difficult for all who feel it to discover their own strengths, and to act in unison with each other.

Basically, what Madison is saying, is that if we have a very large nation, then no one faction will ever be able to be in touch with itself in order to impose its will on the rest of the country. It was the exact opposite of the old Republican notion that you had to be face-to-face. Basically what Madison is saying is get people so that they cannot be face-to-face with each other, that they're so spread out that they can't be face-to-face with each other. The result of that, I would argue, was that it gave the impetus to the westward expansion, which, of course, led to the formation of your state and mine. It led to the formation of the West as we know it.

But implicit in that westward expansion is exactly what Wendell Berry is talking about. It is a kind of essential placelessness, in which we know each other as Americans, as members of some large body politic, but never directly as inhabitants of some one place. The result of that, I would argue, is that increasingly we have come to rely upon the nation-state as the formulator of public policy, as the one that sets the tone for all of our political culture. And that in relying on the nation-state in that way, we have done two things. We have taken people away from their basic democratic understanding of themselves, which is an understanding that in order to live well, you've got to deal with people close to you that you don't necessarily agree with. And secondly, we have come to think that this giant that we call the nation, is actually a democracy, when in a very fundamental way, I think, it is not.

And I would argue that most of the problems that we deal with here are problems that come from our having given so much power to the federal government. And I would say that it goes both ways. That the mining industry, depending upon the mining laws, or the environmentalists, depending upon clean water laws, are engaging in the same kind of self-deception about where the roots of democracy might really lie. As a result of all of that, it seems to me that as a people we have largely forgotten both who and where we are. And in order to refine that concept a little bit, I would just like to remind us for a moment of one wise man, who visited the West at a time when it might have been possible to develop a very different approach to inhabiting the West. I'm referring to John Wesley Powell, who suggested that what it would take to inhabit the West well was to draw jurisdictional boundaries according to the way the water flowed. We, of course, did not do that.

If you look at the jurisdictional boundaries in the West, you see something that you know was asking for trouble. Straight lines. Right. At least Montana has one jagged line in its boundary. I will lay that on you. Now it happens that when they drew that jagged line, they thought that they were drawing it along the Continental Divide, and it turned out they weren't. So even that jagged line was

a mistake, but at least it was a jagged line. But when you draw straight lines across the terrain, you are guaranteeing that you are not inhabiting the land in the way that we should inhabit the land.

So in that, it seems to me, that we have clearly departed from any notion of being where we are. And yet when I say that, looking at a crowd like this it seems to me that there is a new paradigm that is emerging. Part of what I think is coming back to our consciousness is a rediscovery of the importance of the way the water flows.

I was just having a conversation in the lunch line with a reporter from Grand Junction who was talking about the change that has happened in Grand Junction or is happening from the town treating the river as its backyard, to getting to realize once again that Grand Junction is where it is because the rivers are there and are coming together there. It's exactly the same as the story of Missoula. Missoula is clearly where it is because of the way the water flows because Hellgate Canyon is right there and had to be passed through by anyone who wanted to pass from the East to the West. And yet, for most of its history, Missoula ignored the fact that it was there because of the river. And it's only within the last 15 years that we've begun to remember that we are there because of the river. Now we have turned around and begun to clear up the trash heaps that we made on the river. We've looked along the river bank and we have seen that Front Street, that runs parallel to the Clark Fork River, has all of its buildings facing Front Street and facing away from the river. And slowly but surely, those buildings are turning themselves around and facing the river once again. And there is nothing, no one thing, that makes life in Missoula more exciting, more hopeful, there is nothing that pulls the town together and gives it a sense of identity and a sense of vision, nothing that even comes close to the rediscovery of the river.

But I would say that this rediscovery that we see taking place in western towns throughout this region is something that reaches beyond the towns, and that begins to open up the possibility of knitting together once again the towns and the countryside which have always been so at odds with each other in the West. We in the West have treated each other essentially as an agrarian place, in which cities have been treated as strangers on the land, but we know it's not true. We know politically that it doesn't even come close to being true.

But the question is, how can we begin to heal that division? What I would say is that the way that we begin to heal that division is to start to recognize the organic relationships that exist, or that should exist, between cities and their basins. And that in order to accomplish that, we need to begin to develop a concept of basin citizenship, which is within our grasp.

I'd just like to speak to you very briefly about an experience with the Clark Fork Project that Paul mentioned that I've been involved in. What we did with the Clark Fork Project was basically to go out and identify all of the major interests that had a stake in the Clark Fork Basin: the mining interests, the timber interests, agricultural interests, fisheries, utilities, municipalities. And we asked them to come together and to talk about the basin as if they all cared about the basin. And that hypothesis was a very large hypothesis, because when they got in that room together, basically what they knew was that they were among enemies, that they were among people they did not trust, people who they felt had ripped them off time and again in the past and would take every opportunity to do it again. But working with

these groups, we have gradually begun to build up what I think is a sense of basin citizenship.

Just in this last session of the legislature, the utilities, Trout Unlimited, the agricultural groups, and the municipalities went before the legislature and basically said, "Time out," on a contested case proceeding that was building on the Clark Fork over instream reservations, a proceeding that promised, when we got into it, to pit Trout Unlimited against the agricultural interests, against the utilities, in a way in which everybody would end up being a loser. And what we were able to do with this conversation, was to get people to recognize the common stake that they had in the river basin and to say if we apply ourselves to it, we believe we can come up with win-win answers here in the basin.

What was fundamental to doing that, and I think we have taken a major step in the direction of making that work, what was fundamental to doing it was to get people to recognize that it was all one basin, that you couldn't have everybody pursuing different interests and end up with any of those interests being well-satisfied. They had to get away from the Cuisinart Theory of justice into something else. And that something else is what I would call politics. And I would like to read to you a definition of politics by Benjamin Barber, the author of Strong Democracy. And listen to this definition of politics in terms of an idea of basin citizenship, of the recognition that in the end, there is only one basin.

Barber says, "To render a political judgement is not to explain I prefer, or I want, or I choose such and such, but rather to say I will a world in which such and such is possible. To decide is thus to will into being a world that the community must experience in common. It is to create a common future."

He compares this to the Cuisinart Theory in this way, to the theory of interests. He says, "Interests can all coexist in the world of reflective reason. One is as good as the next. But wills can not all be equally legitimate in the same sense, because by willing, one affects the world, and the world is finally one, our world. With interest, we may ask, do you prefer A or B or C. With wills, we must ask, what sort of world do you will our common world to be?" It seems to me that's the sort of question we got to start asking politically, is what kind of world do we will our common world to be? But in order to ask that question, we've got to stop asking it in the abstract. We've got to start asking it about places that are real places, and the most real places of all are river basins. And within those real places, cities play a fundamental role, because it seems to me that any true city is a city that draws its strength and its sustenance from its surrounding countryside. And as mayor of Missoula, I've been very interested in playing a part in this definition of what the Clark Fork Basin is all about, because it's a definition of what Missoula is all about. Missoula draws its strength, it draws its possibilities, from that basin. It can never, as Wendell Berry says, be better than the basin itself, can never be stronger than the basin itself.

But notice this. That in appealing to nationhood, and to statehood, that we take from cities the responsibilities that they should owe to their basins, because we allow cities to be bigger than they deserve to be. We allow them to outgrow their basins. We allow them, therefore, to exploit other basins. Look at Los Angeles. Look at Denver.

Imagine what it would be if you had a situation where you said, as I think we can say about Missoula, that Missoula has to have some kind of sense of responsibility and scale to its basin. Why

shouldn't Denver have to be scaled to its basin? Why shouldn't Los Angeles have to have the same kind of sense of responsibility to its basin? The reason is simply this: that we have overlaid over what are the fundamental organic political entities, the fundamental organic political entities have always been, from the time the word politics grew out of the notion of the nation of the city-state, the fundamental political units have always been the city-state, which is the bioregion, which is the city focusing a river basin. What we need to do in order to bring a sense of organic inhabitation back into our politics is to take every opportunity to reclaim that sense of the city-state, of basin citizenship, in which people are held responsible for the well-being of the basin, and are not allowed simply to pursue their own private interests.

I think that's within our reach, and I think it's something that all of you have the capacity to promote. But in order to do it, I'm convinced that we have got to begin to challenge our reliance upon the nation-state. All of us. Liberals and conservatives alike have got to see that the nation-state is a fundamental way of undermining both the idea of democracy and the idea of habitation.

Building basin citizenship is hard work. There's nothing easy about it. There's nothing guaranteed about it. You're going to continue to have conflicts. You're going to have to continue to work through those conflicts. But I'm convinced that if you begin to hold inhabitants of a basin responsible for that basin, that they can rise to that challenge. That we are all basically democrats. As somebody said, the price of democracy is eternal vigilance. I don't think we've understood what that means. It doesn't mean building missiles. It means attending to democracy, and that means attending to being where you are.

Finally, then, I think in addition to dealing with basins, that we've got to think regionally, and that the West above all has got to start asserting a sense of identity, a sense of vision, a sense of what it is to live here in the arid backcountry, if that's what we want to call it. And we've got to start to say that we in the West know what the West needs. In order to do that, in order to assert that claim against the federal presence, we cannot possibly do that until we overcome some of the petty bickering that we so love to engage in, until ranchers and environmentalists, trout fishermen and local miners, are able to sit down together and say, "We've got a common stake in this place."

Finally, I agree with the Lt. Governor that the thrust of power is moving east and moving west to California. But that the West can reclaim the homeland if we do two things. If we first of all begin to understand that we do have to cooperate with people we don't necessarily agree with in inhabiting this place, and if we remember that at the founding of this nation, one very wise decision slipped through. And that was to leave one place-centered institution securely in place. It's called the United States Senate. There the West has a power that is measured to the land itself. And if the West were to ever name for itself an agenda, were ever to name for itself an identity and a vision, then we could begin to use the power that we have in the United States Senate in an effective way. But in order to move toward that vision, I think we have to recapture the sense of what the West is all about which Wallace Stegner summed up in The Sound of Mountain Water with which I would like to close. And I expect most of you are familiar with this, but it always bears repeating. This is what Stegner says about the West:

There will be some continuing open space. Not all the immigration of the next 100 years as the continent fills and overflows can do more than overcrowd the oases. The arid backlands will remain essentially unpeopled. There will be enough of the old, wild, undamaged country left to give us the smell of sagebrush wetted by a shower, the bitter tang of mountain aspen, the smoke of juniper and pinyon fires, Western smells. Angry as one may be at what heedless men have done and still do to a noble habitat, one cannot be pessimistic about the West. This is the native home of hope. When it fully learns that cooperation, not rugged individualism, is the quality that most characterizes and preserves it, then it will have achieved itself and outlived its origins. Then it has a chance to create a society to match its scenery.

I appreciate being asked to come to this beautiful country, to this beautiful state. Trying to create a society here to match its scenery is good work, work that you're all engaged in, and I commend you to it. Thank you.

Non-point Pollution Control and the Central District's Sustainable Agriculture Study

David True

Central Colorado Water Conservancy District

I'll try to give you a brief outline of what we're doing, what our project is about, and where it's going. I was hired on this project as a project technician. Fred Echohawk is the project manager. He was hired by Central because he has had a lot of experience in dealing with a number of governmental agencies and groups. He also was hired because he has a deep background in agricultural practices, and this was important to the Central board, which is made up of local farmers. They wanted this project to benefit the average farmer.

As you probably already know, sustainable agriculture is really not all that new. It's been around the agricultural community for some time. Depending on who you talk to, the different farmers, there's a different understanding of what "sustainable" is. That's basically the question that we are trying to answer through this project. There are many questions to be answered, but one of the main ones is to come up with what "sustainable" really is.

The EPA first decided to take on this project and came to the Central District because they wanted the involvement of a local group. Central decided to take this project on in December of 1989, and then in 1990 they came up with a draft working plan. Then, in March, they hired Fred. So now the project's really getting going now, now that they have Fred on board, and also I'm involved. A draft working plan was created and they came up with three phases to this project. Phase One of the project was basically coming up with a description or a definition of what sustainable agriculture is. Once they define that, then they can go from that. They decided on a project area. The area is basically from around south of Platteville around the Brighton area, north up to the Greeley area. Once this area was decided upon, they decided to involve ten farmers to do intensive monitoring on their farms.

Fred got busy and recruited the ten farmers. The farmers own a variety of different farming practices. We didn't want one certain type of farming practice because then the results wouldn't be very substantial. So they got ten farmers that have different types of farming practices, and now we're going to evaluate those farmers intensively. We're going to interview them to find out what they have done for the last five years and what they are currently doing, so that we can get baseline data on what is going on in the field right now. Everything from what they are putting down as far as pesticides to what kind of tractors they use and what kind of implements they use.

Step Two in Phase One involves collecting baseline data on what's going on as far as water quality and soil quality. They decided, on these ten farms, to put in monitoring wells to gather data as to what's going on in the ground water. We are currently discussing how we want to monitor these fields. As of right now, there are going to be three monitoring wells put up on these fields to give a idea of what the ground water is doing, what types of pesticides are leaching through there.

Phase Two of this project basically pulls all the data together. We will see what this farmer is

doing on this farm, and then by getting the water quality and soil data, examine whether there is a problem out there. If there is, then, what can be done about it? That's where Phase III comes in. Do we want to try to influence these farmers, or maybe even have the farmers try "sustainable" ag practices? Maybe they'll have the farmer do a different type of tillage or have the farmer do a different type of irrigation practice. So that's basically the third step, or the third phase.

The final step will be to present all that information on the final outcomes to the general public, to the farmers. We can say that we've done some work and we've come up with what we feel is "sustainable" in a sense for our area. We hope that farmers in the area can use this information to do the least damage to the environment.

Question: In reference to dams and rivers, how would you assess water quality impacts from these fields?

True: Personally, I don't think you can. And that's what's been going on with the project. You know, everybody's saying, you can't do this in three years. It's going to take more than three years.

Comment: I serve on the executive council of that project, and we have set this thing up so that it will be operational in five or six years, if we can get the subsequent funding. We think we can secure this funding. And so everything that we're doing now is projected on at least five years, and maybe even a little longer. So if we can get some of this information, we can see what kind of impact various practices might have on ground water. About all we can do is assess the baseline for three years and establish a certain kind of a rotation of crops and get some of the very, very cursory surface kind of data.

True: We're not going into the deep aquifer. We're dealing primarily with the shallow ground water, the alluvial ground water. We think that probably within five or six years, we might be able to see some indications, or, if we don't see any indications, then there isn't very much going on. We're successful. We've got sustainable practices that are not impacting the shallow ground water. Until we get these wells down, we don't know what the nitrate totals are there now. And that's what we're going to be looking at.

We plan to put in three wells per field. The fields average about fifteen to twenty acres. Now, there's a few that we have that are maybe quarter sections. We've looked at other studies in Nebraska, and South Dakota, and we're trying to get an idea of how many wells we need, but nobody out there really knows what type of monitoring you need. We have been discussing whether three's not enough. You're going to have to nest some of them at different levels to get a clear idea of what's going on. But as of right now there's going to be three put in.

Question: How have the farmers reacted to the study?

True: Well, Fred has done a real good job. They've been fairly cooperative. There have been a few

who are sitting back and saying, "Well, I don't know." They take a lot of convincing.

Dan Parker: You've got a certain percentage that are the innovators. And they're the ones that'll pop at any new idea that comes along. Then you've got the ones over here. They never will do anything different. They're going to sabotage any new ideas anybody comes up with. Louie found the same thing when he started, some of his neighbors up there wanted to sabotage him because he was doing things different than what they'd always done.

If we can go five or six years, we get over the hump here, and then if we can just keep monitoring, we can collect a real good bunch of data. That'll give us a pretty significant kind of operation. Same thing with Louie on the grazing. We're just now getting to the place where we have enough holistic resource management stuff around that we've got a lot of people that are interested in it now, and now we're beginning to see the innovations and the subtleties and things like this how it's going to work.

Comment: In response to the question in regards to farmers being willing and wanting to participate on a voluntary basis. We've been running a program for about ten years. Over the last three years we've been looking at a very similar aspect to what David is talking about here. Agricultural practices on nitrification and its influence on the ground water. The thing that we run into up there is the only limiting factor is our personnel in pocket. I mean the farmers are out there. We could triple or more tomorrow if we had the people and the staffing to do it. The interest is there. They're willing to go.

True: Just one other thing on that is that I think that the farmers are afraid, there's been a lot of changes within the environmental issues especially with the EPA. I think the farmers are saying, you know, it's coming, you know, they're going to start regulating us. The changes are coming. And the farmers are saying, if we get a jump on it now, if we get an idea of what's going on and we say, hey, we're not the bad guys, you know, then they'll be that far ahead. So I think that's another reason these farmers are being as cooperative, and voluntary, as they are.

Dan Parker: David anticipates that the farmers are probably going to come up with the innovations themselves. And then we'll just have to say, oh, that looks like a good idea, or maybe we'll have to say, well, that didn't work quite so well because of this and this and this. But otherwise, well, by all means.

This irrigation water management thing I spoke about earlier this afternoon, one of the interesting things we found about it is, that if you reverse the deflector on the bottom of the nozzle, it deflects the water up with nine pounds pressure, just adequate enough so it washes all the mites off the bottom of the corn leaves without using one ounce of chemical. And we never knew that until this one farmer said, well, I wonder what will happen if I turn this thing around. And he did, and, bang, there it is. So not only did you get the water savings, you also saved yourself from putting on a whole bunch of chemicals which cost some money.

One other thing about Dave's project that he didn't mention is that it has an economic and sociological impact, and we're factoring in the economics and the sociological kinds of issues. There will be more than one field on each of the ten farms. It involves six different crops. But then we will be working with another twenty farmers that we will just simply get the case histories on. And we'll keep their case histories of their tillage practices, and their fertilization practices, and their pesticide practices, and integrate those with the ten where we are doing the intensive monitoring and the detail observations. So that we will in effect have a sampling that will be about thirty farms wide through that area. And on that point we figure that we can probably project some decent input/output figures and some other kinds of economic figures and sociological figures. We will look at what kind of technological transfer is the most effective to use. What kind of impact do we have on the infrastructure in terms of fertilizer dealers and equipment dealers and this kind of thing. These are some of the things that we've not done in some of our other studies, or other projects, and then we, all of a sudden we realize, we may have been putting in some practices that killed the local community. And we don't want that to happen either. So that's a part of sustainability also, to be able to sustain the community and the infrastructure that makes it possible for those farmers and ranchers to continue in operation. And so we're going to be looking at that in detail in this project also.

Question: I think there are two things that are critical in a project like this, that can't be overlooked. First of all, practicality, and second, the economics. We can go out here, do some research, and we can spend \$650,000 to put an irrigation system in that will irrigate the 95% efficiency that you're talking about. But if I've got a farmer that's there that probably can't get a loan from a banker to go buy enough vinyl tubing to set it, we've lost the whole thing. Likewise if we're coming up with a procedural type thing and saying you need to change your irrigation spacings, or whatever. Maybe he's on a lateral system where he's got water in the ditch for three days and then he's out for five. You're going to have to address all these things because at the time they're getting five days when it's dry.

Parker: Well, the whole point of this economic study is to be able to put the economics behind the pure theory, the pure technical theory, because that's, that's as much a part of sustainability as the theory is. And if you can't make it economically and sociologically acceptable, then there's no way the theory can become practice. Otherwise, if it does become practice, then you've lost those people. They're just no longer there. They cannot afford to be there any more.

**Grazing Management and Non-point Control
Questions and Answers**

Louis Coszalter, Stirrup Ranch

Question: Have you seen the wildlife and other things come back in the area yet?

Coszalter: We're also managing for a winter elk herd of about 3500 head up there, so in sitting down with these different people and planning our grazing, we have areas that we know elk winter in. So what we're doing there is we're intensively grazing them early in the year, just probably right during the growing season, at the start of the growing season. We're taking 90 to 95% of the forage. It has a chance to regrow the entire growing season, about 100 days up there, and it's left for the wintering elk. So we are seeing the herd increase as far the wintering elk coming in. It's gone from about 1500 head and has steadily increased over the years until now it's about 3300 head.

Question: Now his neighbors complain.

Coszalter: No, not all of them. What the neighbors are doing now, is they are taking advantage of the elk population and hunting guides guiding and stuff like that.

Question: But there are groups that are saying they want cattle off of all public lands because of the sediment in the water.

Coszalter: Well, if you sit down with the people and actually develop a grazing plan, and take whole environment into consideration when you're doing this grazing plan, then I think you can manage for those elk and wildlife with cattle on there, you know. But you do have to plan the grazing and get with the different people involved. But we had absolutely no trouble with anybody on that. As a matter of fact, the Game and Fish have been some of our staunchest supporters on the amount of cattle that we have been running due to the fact that we are increasing ground cover up there and more grass. So now what their plan is to let the elk slide up a little bit more, even, in numbers.

Question: Who is the lead agency involved?

Coszalter: I don't really think we have a lead agency. I guess the RC&D would be the closest to a lead agency. I think he signs the checks on the 319 money, so I guess that would be about right.

During the winter time we sit down and do extensive planning, invite a lot of different people in to those meetings, the public, different environmental groups, and that, and sit down and go over our

plans. We try and meet like that once every two months or so. Then as the grazing season approaches, we go out and we take a look at the range condition, and the actual plan. We go through it and get everybody to agree on it. And then we meet once again during the grazing season. As a matter of fact, we had our last meeting in July with everybody, most everybody up there. And then we'll have one more meeting at the end of the grazing season to go over regrowth and what the riparian areas look like that we've left and things like that. So we try and meet every month or every two months with all these people.

Question: (Inaudible)

Coszalter: I use ADA's, Animal Days per Acre, because I keep my herds together, and so the AUM thing doesn't really apply to that. I'm looking at how much forage I have available for one animal for one day. So what we do is we go out and we start stepping off an area of ground and actually picking the forage the way a cow would graze with its tongue. And carry along a sack and put it in the sack. When I get about 18-20 pounds of forage in there, then I take a look at what it is. And I give it a rating. That might be a 10 rating. In other words it might support ten animals per acre per day. Per day, ok? So that's the way we base that. We don't use those old AUM figures much any more on our ranch.

Dan Parker: So you're managing a much more micro set. It's going to be much more intensive manning it. There may not be very much change in actual tillage practices or in the application of fertilizers. What we will do is we'll change the amounts and the quantities that are applied. And we may change the day or the sequence in which they are applied. In other words the more management-intensive numbers. I guess this is what Louie's talking about.

Coszalter: That ADA figure I gave you, we use that in conjunction with the size of the herd and how many acres in the pasture, and that's how we figure how long we stay in there. And we use a 30 or 90 day rest cycle. We're making our circle around a set of pastures, and it's growing fast. We know from the time we start we need at least 30 days before we can come back in to that pasture to achieve regrowth on a fast grow cycle, 90 days on a slow grow cycle. So, the whole thing is all keyed in to manage for that rest period, because you do not want to come back into that pasture with half grown plants again, because severe overgrazing will occur then.

California's Three-Way Water Agreement Group

B.J. Miller

Water Resources Engineer, Berkeley, California

I was over here earlier and heard Gregory Hobbs and Marc Reisner discussing water matters. I guess that would be a charitable interpretation of what they were doing. It occurred to me that there was a great mistake being made in that discussion that I would like to come back to a little later.

What I'd like to do next is to tell you a story that is just apropos enough of the subject. I've got to give a good excuse for telling this story. It's a true story, and you'll know it's a true story in part because there is no punch line. But when I heard it, I thought, this is one of the greatest true stories I have ever heard. Earlier this year I was invited down to give a one-day course on California water at U.C. Berkeley. I was invited down to give this course to some teachers who were putting together a curriculum about water. They wanted to know about water. The woman who arranged all this was named Amy. And Amy picked me up at the Ontario airport with another fellow, and they drove me out to Palm Desert. It took about an hour to get out there, and we had to stop for dinner and so forth. And in the course of this you have conversations, and Amy told me this wonderful story about herself and her husband Gene.

Many years ago, when they were much younger and their children were smaller, they had an RV, one of these vehicles that has the sleeping thing that goes out over the cab of the truck. And they were on this trip out in the Southwest, and Amy was up in this compartment asleep, the kids were playing in the back. Her husband Gene pulls into a gas station, gets out to get gas. The kids pile out of this thing. Amy wakes up. Her hair is in curlers. She decides she has to go to the restroom, so she leaves this vehicle and goes into the restroom, and nobody sees her go. Gene and the kids get back in the car, Gene turns around and says, "Everybody in?" They think their mom is still up asleep, so they say, yeah, let's go. So they roar out of this place with a full tank of gas, out into the great Southwest, down this two lane road. Just as Amy comes walking out of the restroom, still about half asleep, with her hair in curlers, there goes her husband and children.

She looks over to the side and here are these bikers, guys with Harley Davidsons, tattoos, and those leather vests with lots of studs on them. And they've seen all of this, and they're laughing about it. And the head biker says, "Come on. We can catch them." So Amy, with her hair in curlers, climbs up behind this big biker and grabs hold of him, and they take off, they roar off down the road. And Gene has had a pretty good head start, so it takes them a while to catch them. They roar up beside Gene in this RV, and she says that the double take that Gene did on this was a classic. For years, he was so embarrassed by what happened that he wouldn't let her tell this story. This cooperative effort between Amy and the biker to catch her fleeing husband and children is nowhere near as unlikely as what is going on now in California water circles. And that's what I've been asked to talk about this evening.

The name of this thing is "The Three-Way Water Agreement Process", and it's an effort among

agricultural and urban and environmental water leaders in California to reach consensus on a new water policy for the state. It's a large group. There are about 60 of them, twenty each. The meet about every three months. And they have a smaller group called a steering committee of 18 that meets every two to three weeks. And these are the managers of the largest agricultural and urban water districts in the state. So you can see this is quite a commitment of time. I'm one of those 18 people, and along with three other people we are the staff for the rest of them. I am a half urban, half ag. And we have several subcommittees of about ten people each. They meet every two weeks. And this has been going on since January, so you can see this is a sizable commitment of effort.

I have some observations about this process, but in order to put them in context, I think I have to tell you a little bit about water in California, and I have some overheads I'll use to do that. There are 30 million people in California now. The population increased by 800,000 last year. Sixty some odd percent of that increase was due to births. There appears to be little way that we can control this population growth. Some people say that you could use water to control this kind of growth, but the population is driven by migration and as I said, mostly by births, so it is not clear how you can use water to control that.

In terms of its economy, California is the sixth largest nation in the world, and Southern California alone is the tenth largest nation in the world. These large urban areas, especially the coastal urban areas of the state, now find themselves in the situation where they have no long term reliable supply of water. My feeling is that there is no way that these urban areas aren't going to get the water. The economic damage of serious water shortages in these big urban areas is so great that they can afford to do almost anything to get water and to avoid those kinds of shortages.

There are some numbers that I have here that kind of put the water use in California in perspective. These are 1985 numbers. That's the last time the state put together comprehensive numbers, but then we went into a drought which kind of causes all the numbers not to be so good anyway. So this is a pretty good average of what's going on. We use about 40 million acre feet of water in the state. There's about 6 million acre feet of that that's unintentionally reused, mostly in the Great Central Valley of the state where one farmer's waste is another farmer's supply. The net use is about 34. Agriculture uses about 80% of the used water and urban uses about 16%. There are 9 million plus irrigated acres.

Reservoir capacity is about 43 million acre feet. We are relatively short on reservoir capacity relative to runoff in spite of the fact that we've dammed virtually every stream in the state. We have a much lower ratio of storage to runoff than the Colorado River. Our ground water use is about 16 million acre feet, and we overdraft ground water basins by roughly 2 million acre feet a year to make it all balance. But in a year like this, this overdraft goes up to 6 or 7 million acre feet because the surface supplies are cut back.

This next chart shows a map of the state and the major water systems. I'm not going to go through all of these, but there's one point that I want to make in this that's extremely important. There are many independent water systems in California. They are operated by different entities and some are

even operated by the federal government as opposed to the state government. The federal government operates under different rules. You can see these water projects on the map. Starting at the bottom, the Colorado River Aqueduct which I know that you are familiar with, the Los Angeles Aqueduct, the big aqueducts that bring water from the Sierra across the Central Valley into the Bay Area, and then the Great California Aqueduct.

The planners and designers of the aqueduct thought that they would build that aqueduct and that would bring California together. The North would then care for the interests of the South. The South would be concerned about the interests of the North. We would all be one state. They later gave up on that idea. What that aqueduct did was, it created one water system in the state. Now something that happens in one part of California can have an effect somewhere else. And in fact, what happens on the Colorado, then, backs up the Colorado River Aqueduct and backs up the California Aqueduct up into the great problem area of California water which is the Sacramento-San Joaquin Delta. It's the delta for the Great Central Valley of California which is where most of the water originates. And most knowledgeable water people in the state feel that that's where the problem is. If you can't solve the problems in the delta, and they are manifest, then you can't solve the California water problem.

There are four great problems in the delta. The projects that store water upstream of the delta and export it out of the delta have created great environmental problems, mostly fishery problems. The second problem is that there are 19 million people who now get at least part of their drinking water out of the delta. It's the worst major source of water in the state in terms of quality. These urban agencies that get water out of the delta are finding that with the federal drinking water standards becoming more and more stringent, they are no longer sure that they can continue to comply with those standards at a reasonable cost. And by "reasonable" I mean billions of dollars. The third problem is the earthquake problem. The entire delta is made of peat soils. These soils, as they have been farmed over the years, have literally evaporated and blown away. They refer to the land in there as islands but in fact they are holes. Some of them are as much as twenty or twenty-five feet below sea level. And of course, the delta is tidal, the San Francisco Bay tides are constantly trying to push water back up into the delta.

This is a seismically active area. There are seven major earthquake faults close enough to the delta to cause ground shaking that is great enough to cause the soils underlying the delta and the levees to liquify. This is what happened with the freeway collapse back when we had the Loma Prieta Earthquake not too long ago. Also, they've done studies on the incidence of these earthquakes, and they have found that during the period from 1830 to 1910 there were 18 large magnitude earthquakes. These quakes relieve the stress on the plates. And in the period from 1910 to 1970 there were no large magnitude earthquakes, as the strain began to build up. And since then we've had four major earthquakes. What the seismologists are saying is that we appear to be entering into another several decade period of earthquake activity.

The final problem the delta presents is that it's inefficient to move water across the delta, or from upstream of the delta to these big aqueducts. So the acceptable means for supplying the growing urban needs of California (which is not the building of new dams; we haven't built a new dam there in twenty

years) is by some sort of water transfers from agricultural to urban areas, and by banking water in ground water basins or in offstream storage reservoirs south of the delta. But the problems in the delta conspire to make that very, very difficult if not impossible.

I have one more chart I want to show you. This one kind of typifies the problem in the state. This is a pie chart that shows how the water in California is used. This is not just the developed water, this is all the water. Of the developed water, agriculture uses 80%, but of all the water, agriculture uses a little less than a third. About a third is dedicated to environmental uses on the Wild and Scenic Rivers on the north coast which are off-limits to development, and in other places where fresh water is dedicated to the environment. About a third of it is uncontrolled, or unregulated. Despite the fact that we have so many dams in the state, we cannot capture and control and put to use a lot of the water in the state. And then we have this little bitty slice up there, the urban use, which is 6%.

This chart is convenient for describing the interests of the three groups who are involved in this great experiment. The urban users are growing like crazy. They have no apparent way of controlling this growth. They need more water, and they're going to get it one way or the other because they are too powerful politically, and they have too much money. To give you an example, the water agency who wholesales water to about 15 million people in Southern California had a surplus of a billion dollars a few years ago. They could have written a check for a billion dollars.

Down around the bottom of the chart, you've got the environmental users. And the environmentalists want water back. This is what Marc Reisner was talking about today. "You other people have taken our water, and it has damaged the environment, and we want water back." Well, the water sure isn't going to come from urban uses, that's for sure, so it's got to come from one of these two other slices here. It is going to come from agriculture and it's going to come from some of this unregulated flow, which incidentally, the environmental interests would say, ought to be dedicated to the environment too. So their desire would be to have say, two-thirds of the water dedicated to environmental uses.

I don't know how environmentalists are in Colorado, but we have a particularly nasty and effective brand of environmentalists. They are a very impressive, very impressive bunch. They have excellent connections with the news media. I've watched them in twenty years grow from kind of laughable organizations to organizations that now are at the table with the traditionally powerful water interests in the state, and by virtue of the influence that these environmentalists have, they have every right to be there. They are not harmless in California. I don't know how they are here; in California they aren't.

This environmental movement nationally and in California is not just a movement; it has been translated into some very powerful laws. The implication of this is extremely significant in California. What it means is that the political will to do something, having the politics lined up, is not good enough. You've got to figure out what to do about the Endangered Species Act, and the Wetlands Provisions of the Clean Water Act, and the California Environmental Quality Act, and the National Environmental Policy Act. These environmental laws now coexist equally in the power structure with the politics of

water. And this is a realization that we've only come to recently in the state, that you've got to be able to figure out how to work your way through or modify, or finesse, somehow you've got to deal with these laws if you're going to do anything to solve these problems.

We're in the fifth year of a serious drought in the state, and in my opinion, the guy you heard talking earlier today, Reisner, is probably the most powerful water person in California if not the West, right now. It's not because of the way he speaks, it's because he is a writing S.O.B. He can really write, and he has captured an idea, that is that water should move from agriculture to environmental and especially to urban users. He has captured that idea, and he is writing about it in the Sunday magazine of the New York Times. And people are reading it and they are being persuaded by it. And it is becoming part of their ethic about water. Whether you disagree with Reisner or not, you have to contend with this idea.

I was talking with the Director of Water Resources in California the other day. He said that he had been to a meeting of the Los Angeles Chamber of Commerce. And he said, "I tried to explain to them the difficulties of this business of transferring water from agriculture to other users, and the water rights problems, and third party effects, and all of this," he says, "and they just don't get it. These are business men and they don't understand why you can't take the money and go out and get the water."

Pete Wilson is governor now, but we've had two governors before him, each of whom served two terms: Jerry Brown, and George Deukmejian. Each of these governors took one shot at leadership on California water, and leadership in this case meant solving the Great Delta problem. They took one shot at it. It's like they stuck their head out of the foxhole, and they saw they were firing real bullets, and they put their heads back down in the foxhole for the rest of their terms. So we've had sixteen years of fruitless attempts at leadership from the governors of California, and essentially nothing has happened. And I think it was a smart decision, this is too tough a problem. Talk about getting ground up in the interface, this is what can happen to governors, and did happen to governors, when they tried to solve the California water problem. It's a political minefield, and the situation we evolved into, and this is the one I saw today between the speakers just before lunch, is largely an adversarial process. That's what happens, I think, in the absence of leadership.

We have one forum after another in California where people can come and fight like hell over water. Environmentalists, usually, versus agricultural and urban interests, but the agriculture and urban alliance is threatening to split up. We have an entity called the State Water Resources Control Board, of which I used to be a member, that has been holding hearings trying to decide what to do about this delta problem, and it has turned out to be too big a problem for them. I think largely it's because the process they administer is an adversarial process. And what is becoming clear in California is that maybe this adversarial way of trying to solve this problem is not going to work.

Now, to get to this process that I was asked to talk about. About a year and a half ago, the agricultural and urban water managers of the state, the managers of the big agencies, began meeting at a retreat. It was out at Pardee Reservoir, which is a reservoir that serves the east part of the San Francisco Bay area. They had a series of five meetings or so, originally to talk about water transfers,

to kind of see if they could develop some approach to water transfers and get out ahead of that issue. But pretty soon they began to talk about California water policy in general and to realize that they couldn't do much about the transfer thing unless they could do something about the delta, and they couldn't do anything about the delta without getting into the whole question of California water policy. At the same time, the urban managers were invited to meet with the environmental leaders, and they had a couple of meetings off in a retreat. You can imagine how the agricultural interests felt about this. So there was a lot of posturing around there, and eventually they decided that they all ought to be meeting together, and that was the beginning of this thing known as Three-Way Water Agreement Process.

Let me now turn to last Friday. Last Friday the large group of sixty had its third meeting. It was the first meeting where they were supposed to approve something, take some action. What they were supposed to act on were some principles that had been wordsmithed, literally, by these eighteen people for three months. There were four principles. Going into the meeting, we thought that it was going to be maybe the end of the process. The agricultural people were upset because their principle wasn't equal to the urban principle, the environmentalists were saying that the agricultural people were trying to be manipulative and they were going to try to pull some last minute deal, and if they do, they can walk. "We'll go together with the urban guys and we'll roll them." There was a lot of snorting and pawing the earth leading up to this meeting, and those of us who were responsible for this really thought it might collapse.

The small group met early in the morning, and darned if they didn't come into the meeting with the idea that we cannot fail here. Governor Wilson had sent a letter to them that said, "I'm really pleased that you're doing this." I mean, for no other reason, it's taking him off the hook. What this group might be able to do is to create some safe political landscape on which Governor Wilson can act to create a new California water policy. They began to talk, to work on this agreement, and literally they wrote, rewrote a couple of sections. The ten of them did. We wrote them up on big charts so that when the sixty people got there they could read them, and they voted. The three delegations, went off and caucused. I went in to the caucuses and they were pretty bitter, and darned if they didn't all come back in there and adopt these principles unanimously.

A fascinating study in human nature. I don't know what was happening, whether it was, "we can't let this die", or, "if we back out, the other two are going to get us", or, "I want to be part of something great." I don't know what it was. But we had this unanimous vote on these principles. The principles say stuff like, "we ought to have enough water", "you ought to have enough", that sort of thing. These aren't great principles. These are kind of wimpy principles.

Let me say a few words about how I think this is going to turn out. I think what they're working on is a package deal. The idea is that even though you might look at part of this package and not like it, that the whole package is going to be O.K. All right. So the package deal, and there's quite a bit of progress on this already, is going to be a set of guarantees of environmental protection for the delta and maybe upstream areas. By guarantees, I mean protections, to be blunt about it, that cannot be overridden by Southern California. O.K. They have a majority of the population, they have a lot of money, you've

got to craft a set of guarantees that they can't override. And probably the guarantees will take the form of some sort of multi-party contracts backed up by federal legislation on the theory that Los Angeles is going to have a hard time convincing some East Coast Congressman that they ought to change these protections so that they can ruin the San Francisco Bay Estuary and get more water so that they can get even bigger than New York. O.K. That would be tough argument to make. There will be a water transfer program that provides some guarantees to agriculture that the program will be voluntary, and that the third party effects, the agricultural, the rural communities of California, and the environmental interests, that are associated, that benefit from agricultural water use will not suffer.

There will be some water facilities, especially in the delta. The big facility that has attained quasi-religious status in California is the Peripheral Canal, which would take water around the eastern periphery of the delta. There was a vote on that facility in 1982. It passed 60-40 in Southern California, and it lost 90-10 in the Bay Area, which I heard somebody say is characteristic of votes in totalitarian regimes. There will be a big program to increase the acreage of wetlands in California, and there will be some system of rules that puts all three of these parties on the same side. For example, there will be, there could be a rule that says that if water is transferred from agricultural to urban uses, that environmental interests will get a share of the water. The urban interests don't like that, but they may come to realize that if they have that sort of a deal, then they get the powerful environmental interests on the side of the things they need to do to get a reliable water supply. And there would be some sort of guarantees of urban conservation and reuse. That's what I think the package is going to turn out to be.

Let me make some observations, now, on this process, that may be useful to some of you here. First, I want to emphasize, there's no guarantee of success. This thing could blow up at any time. But, there is a lot of hope about it. One observation is that the conditions have to be right. The conditions in California were that these three interest groups found themselves at a stalemate. Each of the three was powerful enough to veto the actions of others of the other two to attain what they wanted, but none of the three was powerful enough to attain what they wanted on their own. So it was like three of these large tyrannosaurus Rex, one with his jaws on the throat of number two, and two on three, and three on one, and they're all looking at each other, you know, afraid to let go. So we had a situation where they all realized that it wasn't working. That continuing to fight meant that probably none of them was going to win. We had a drought. That helped, because that activated everybody and heightened the crisis. And we had a new governor, who gave some indications, like the last two governors, that he wanted to do something about the water problem.

The second observation is that you need some process to reach agreement. It's not enough just to have an agreement, I mean the piece of paper. This is a human nature kind of a deal, and people have to go through the process. A year and a half ago, I went to lunch with an environmentalist. We had discussions and we came up with a deal. And I made a big mistake: I wrote it down. And this thing got out in California water circles, which prompted a flurry of activity which one person characterized as "find and burn all the copies and shoot the author". The thing I wrote a year and a half ago is not

much different than the way this process may turn out to be, but it was just a piece of paper. It did not have the blood, sweat and tears of these powerful water and environmental leaders in it.

You have to have some process that allows for the development of understanding of the others' positions, trust, which is a slow thing in coming, and some sense of pride in what they're doing. I think all the people who are participating in this are beginning to sense that they may be doing something that's historic, and they don't want to be left out. I think you have to have some people who are dedicated to protecting the process, because Lord knows, there's enough outside activities, legislation by Miller and Bradley, and the contentious processes that are always ongoing, to cause people to pull apart. You've got to have some people who are interested in keeping the process going. You've got to have the right people. I don't know how to define the right people, but you know them when they walk in the room. And when you read the list of right people, people nod their heads. You know, they don't look at you funny like, "Why do you have those people involved?" You've got to have the right people. You have to approach this, I think, with the idea that this is a highly personal process. You are talking about the power that individuals have. That's what this is all about. Water is a surrogate for that. This is all about power, and the process has to be approached that way.

I think you have to realize that given the conditions we exist under in water in California, and from what I heard today, in Colorado as well, it's easier to fight and lose than to risk cooperation. If you're an environmental organization, fighting brings money to your organization. If you're a water attorney or an engineer like me, you fight, you lose, you go back, they pay you, you know. It's not a contingency deal. They pay you, even if you lose. And they slap you on the back and they say, "That was a good fight. They were too much for us, but that was a hell of a fight. Let's fight some more." You know. Let me take your helmet off and I want you to run into the line, one more time. Twelve more times.

You have to build a coalition. You've got a certain critical mass of people who come together and try to do something like this, but they're only, in this case, eighteen or sixty of them. There's 30 million people in California. Now they all don't have to be involved in this, but there are a whole lot of others, especially politicians, who at some point have to come on board. There are business people who have to do that. There are minority organizations. At some point the coalition has to expand and other people have to buy in. You have to create a train that's so big that everyone's afraid to get off. At some point, you're going to need an authority figure. Governors are real good at that. In this situation, we only really have one person that the participants may recognize as a power greater than each of them. And that's the governor. And so at some point we may need Governor Wilson to come in and say, "You're going to have to behave yourselves. You're going to have to stop acting like children and start acting like adults, and I'm going to watch and see who does and who doesn't, and there will be hell to pay if you don't." You need some idea that the deal is possible. Some people have to have the concept of what the nature of the deal is.

I'd like to close now, and I'll take some questions, if you'd like to ask some. None of us who are participating in this knows if it's going to be a success. It's worth a try. It would be hard, after this,

for me personally to go back to fighting again. I mean, I was, I thought I was pretty good at it. I'm not so sure I would have my heart in it the way I did before if this process fails and we have to go back to this purely adversarial stuff. I also have the sense that within all of us, kind of layered over by the lifetime of fighting, is the idea that there is a better way to solve these problems. Maybe that's why as all of us old California water adversaries are spending so much time and risking so much to make this thing work. And I hope we will be successful. Are there any questions? That I can answer?

Question: (Inaudible).

Miller: I can't repeat the three principles, I mean I can't remember them. They're public now. The first one is that it's a package deal, and the principle lays out the elements that would be included in the package. The second principle says that there will be guarantees of environmental protection for the delta and the tributary waters, and it talks about the nature of those guarantees, at least the form of the guarantees. What is a guarantee? I mean, when we talked about this, the committee that worked on it, talked about constitutional amendments and concluded that was not a guarantee because you can overturn those with a two-thirds vote. So they came up with a three-tiered guarantee process, a new environmental entity, a multi-party contract backed up by federal legislation. You'd have to have that anyway to authorize the federal agencies to execute the contract. The third principle was that there should be reliable supplies of good quality water for urban uses, and that the quality should be such that they could comply with the drinking water regulations at a reasonable cost. And there was some elaboration of what that meant. And the fourth principle pertained to agriculture. It said that agriculture should have a reliable supply of water, and there was a description that that meant something different than urban reliability because of the circumstances in California. And that if water is transferred from agriculture, it should be a win-win deal. The transfer should be voluntary. There shouldn't be takings. And that the transfer should occur in accordance with certain principles. One important one being that third party effects, environmental or social-economic effects of these transfers, have to be dealt with in a way that's agreeable to agriculture.

Question: What motivated the formation of this group? The drought?

Miller: The people who have been dealing with the situation knew full well there was a crisis without a drought. I mean you didn't have to have a drought to know that if there were a drought, you'd have a crisis. Also, one effect the drought had was to be highly preoccupying to the water managers, who were key participants in this. I mean, they had these water agencies to run during a drought. So they literally were having trouble coming to the meetings. They don't send their underlings. They come to the meetings. In this case, I think, that once this thing got started, it was a party whose invitation no one could deny, partly for the sheer fun of it, and partly because your interests might get gouged if you weren't there.

Question: Are you considering longer range solutions like importing from Canada and maybe even buying Colorado's good water?

Miller: Imports from Canada would be like EIS on the Manhattan Project, you know. No. We aren't.

Question: (Inaudible).

Miller: California has a hard time going to other states and saying, "Give us some of your water." I mean if I were another state, I'd look at California and say, "Wait a minute. You've got a lot of water. You chose to put it off limits. You have the whole north coast. I'm not saying there's anything wrong with what we decided to do, but we put that area which is now 60% of the runoff in the state, essentially off limits to development. So if I were another state, and California came to me and said, "Listen, I'd like some of your water", I'd say, "Well, listen, you've got enough water, there, you know, and you chose to put it off limits". Or, if I were another state, I might take Reisner's tack, I might say, "Look, you evapotranspire 25% of total water use in the state from irrigated pasture and alfalfa. Maybe you ought to look there first."

Question: What was your impression of the debate between Greg Hobbs and Marc Reisner?

Miller: I listened to them, and I had this impression that if you locked them in a room without a restroom, and you said you're going to have to come out with an agreement, here, that they would be able to do that. I heard a lot of inflammatory rhetoric, but when they got to the end of it, I heard disagreement on values and principles and all that. But this boils down to water, and where it's moved and who gets it, and there I wasn't hearing a lot of argument. The reason, I guess, that I heard that, was because that was what we were hearing in California. When you stood back from the argument, you know, it's like we would argue about it, and the preface to the real point was so inflammatory that everyone listening was in a state of cardiac arrhythmia by the time you got to the bottom line, which was that maybe we weren't that far apart anyway. You know. And that's kind of what I was hearing there. So that's what I think the mistake is. The mistake, in fact at this last meeting on Friday, where we thought the process was going to blow up, we orchestrated speeches by three of the most influential people there, one each, on kind of like, on adult behavior in the meeting, you know, on the theory that if anybody came in and started bomb throwing, we could say, "This is not what we do in this meeting. We don't behave like that. We behave like that outside of this meeting, but in this meeting we don't behave like that."

Question: What are the state and federal agencies doing while this is going on? Are they just watching?

Miller: Well, the state agencies are doing what the governor wants them to do. And the governor really

likes this, so far. The federal government, the Bureau of Reclamation, will go along with it because the state, you know, is going along with it. They have problems that this process would also solve. So, so far, we have not run into problems with the state and federal agencies. Not to say that we won't. I mean, not to say that this whole thing wouldn't blow up, you know. It's riskier. These participants are attached to this process, at this point, with a bungee cord. And they're attached to their constituents with something like one of the cables that holds up the Golden Gate Bridge. And gradually, as they participate, what you begin to see is more and more attachment to the process, a little more willingness to trust the others, a little more hope that this could secure their place in history, that sort of thing, that they could do something grand.

Question: What do environmentalists have to bring to the negotiating table?

Miller: Well, it's not so much what they bring to the table. It is the reality that you cannot have a deal that they aren't part of. And everywhere you turn, they are a powerful if not a dominate influence. So you can't put together a deal in their absence. They have to be at the table. That was the conclusion. And I firmly believe that. They have, that's why I made that comment about California environmentalists, they have gotten themselves in a position where they cannot be left out.

Question: I understand that. But what do they bring with them to the table? What do they have to exchange for water?

Miller: Well, are they going to pay, you mean, for example? No, I think what they're going to do, if it works, is that some of these environmental leaders are going to have to go back to their constituents and say, "This deal is all right. We can support this deal. This deal is all right." The problem with leaving them out is that when the deal is done, they will go back to their constituents, they'll hit their speed dial button for the editorial board of every major newspaper in the state, and they'll say, "This deal is not all right." And they'll create a situation where the governor cannot act, which is what's been happening before. I mean, maybe it isn't fair. I sense that that's your concern, that it really isn't fair, but that's reality in California.

Question: Did you factor in the unused water from the upper basin in terms of meeting increasing urban demand?

Miller: No. This is a deal that leaves Southern California kind of on its own to do what it can. You know it has a 1.2 million acre foot aqueduct, and it's conclusion is that it has to fill that up. It filled it up in the past, and now it can't fill it up and given the growth they've got, they need to fill up that aqueduct. They need to fill up the pumping plant on the California Aqueduct. And then, once they filled up those two aqueducts and the population continues to grow, which all signs are, and they've done all

the conservation and reuse that they can reasonably do, they're going to have to do something else. They're going to have to build desalting plants, or something. And they're starting to look at that.

Question: What assurance do you have that of the groups that are represented, that they in fact represent their members, within the agricultural and environmental groups? And won't other urban groups, or other environmental groups, or other farmers' groups suddenly pick this apart from the outside?

Miller: That's a possibility. I mean we had the Audubon Society, the Sierra Club, the Natural Resource Defense Council, the Environmental Defense Fund, and the Planning Conservation League. The theory being, there isn't another one around that can beat those five. Now the problem is if the Environmental Defense Fund or the Natural Resource Defense Council walks out. That's been talked about and they've exhibited some anxiety. So that's a real concern. And there is the general concern of how do we know you can deliver. When the water interests ask them, they ask the water interests. I mean that's a legitimate question for California agriculture too. That's far from a monolith. So there is the great deliverability question, but it's one that I think the group will have to deal with. They all have that problem. In that sense, it's a unifying factor, that they have a common problem. Boy, are they going to kill me when I go home.

Question: (Inaudible)

B. J. Miller: I don't know much about the Colorado. I mean I certainly don't know enough to comment knowledgeably on the specifics of something like that, but in general, I'm reflecting back on say, California agriculture's posture on water transfers, or water marketing, marketing is not the right word. The word we're using is transfers because that includes the possibility of conjunctive use projects, and a lot of things that are good for agriculture. But California agriculture is still making a mistake by not getting out ahead of that issue. And so to the degree that that's happening in the situation you're describing, my feeling is that it's much better for the parties of interest to get together and attempt to get out ahead of that issue because if you don't, Reisner will get out ahead of the issue, and then you will find yourself, you know, being drug along behind this sort of juggernaut of public opinion that has been created by people like Marc. But that's tough to do. I mean California agriculture has a hard time getting out ahead of this transfer issue. They'd like to fight it. And a lot of the people involved would like to fight it for a variety of interests. Like I say, it's easier to fight that one than to get out ahead of it. But the handwriting is on the wall on this, on this agricultural transfer thing. The only question is, is it going to be done in an orderly, voluntary, mutually beneficial way, or are they going to take the water from agriculture? That's the question in California.

Question: Can you comment on how your three-way agreement group might compare with Governor Lamm's water roundtable in Colorado?

Miller: No, I'm not familiar with that process. No, I'm sorry to say. Well, it would be interesting if we knew what we were doing. I mean, I'm an engineer. I mean, we're stumbling along through this. Well, I guess that's the nature of these. They involve human beings.

Colorado River Operations: Coping with Changing Public Values

Rick Gold

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Glen Canyon Dam and the associated power plant is what's called "load following", sometimes called "peaking". That means the plant produces electricity when it's needed most. Electricity can't be practically stored. You don't put it over here in the bucket. I've said that before, and folks say, "Yeah, if you'd put it over here in this bucket called a reservoir, you can in fact store it", but electricity, the commodity can't be stored. Demand for it also is affected by seasons and weather, and the beautiful part of hydropower is that when power is needed, you simply open those gates and valves and you let more water be released through those turbines. It's quick. It's responsive, and it's efficient to allow the amount of power that is generated to be changed in response to demand.

Strangely enough, all people don't get that little pitter pat when they talk about that fluctuation. They see that fluctuation as the focus of this controversy. One of the primary reasons is that just downstream of Glen Canyon Dam is the Grand Canyon. The controversy is nested in the fact that significant floods have to bypass these facilities that are built and fluctuating flows occur on a daily basis. Those two changes are being cited, and were cited in the early '80's, as causing significant damage to the downstream environment. Keep in mind, what that downstream environment is. It's the Grand Canyon.

The controversy began as a result of another set of values that I think many, many people in the United States learn sort of the hard way. In the mid '70's we had an oil crisis. The country was looking for more energy supplies. Reclamation in response to that started looking at what can we do? We can add some generators at Glen Canyon. We can upgrade the ones we've got so we can get a few more megawatts out of each generator. And so we started looking at how we could add to the energy that we presently produce. We did some studies. One of the things we did was go out with an EA, Environmental Assessment, on the potential for adding generators and upgrading the Glen Canyon generation. We got some public input. It was strong, and it was against not only expansion of generation at Glen Canyon Dam, it didn't like current operations very much either. We found out a lot of things that maybe had been stored up for a lot of years, but the point of the matter is we now had a hot, public topic.

In 1982, Reclamation began the Glen Canyon Environmental Studies. And we began to study the impacts of current operation of Glen Canyon Dam on that downstream environment. We began in 1982. Guess what else began? Nineteen eighty-three, -four, -five, and -six were the four highest flow years in the history of the Colorado River Basin. And many of you probably watched as we did, our breath was probably held a little more than yours, as the spillways went into operation at Glen Canyon Dam, there were a lot of nervous folks in Reclamation. We created a whole lot of damage by bypassing some of those floods through the spillways. So, we were doing studies in the Grand Canyon to look at

the impact of current operations while the four highest years of record were flowing down the Canyon. We had no normal fluctuating, load-following, kinds of flows. We had high, constant, flood flows going on in the Grand Canyon.

That phase of the studies was completed in late 1987, and the reports in 1988, as they were reviewed and the conclusions were drawn. It doesn't seem strange to many of us, but one of the conclusions was that we didn't have enough data. We needed some more studies. This was primarily related, I think, to that fact that we had four years of extremely high flow and not much data on what would go on in a 1989, or a 1990, or a 1981, or '80. None of those other typical years was even in the data mix.

So we began Phase Two of Glen Canyon Environmental Studies, to look at normal operation plus start to get some additional data on economics, not only hydropower economics, but recreation economics, some of the other values that are of concern at Glen Canyon. Phase 2 began in October of '88. There was a lot of political pressure involved in that. A lot of people were not happy that we had studied this thing to death. A lot of people weren't happy that we did not have all the right answers.

Political pressure tends to yield to political decisions, in my view, at least. In July of 1989, the Secretary made the decision that he would begin the preparation of an environmental impact statement on the operation of Glen Canyon Dam. Some six months after we'd begun Phase 2 studies, we now had an EIS process to develop, we had some time frames that were not the same as we had originally laid out. We had originally planned a four or five year study for normal operations. EIS process required that data be collected much sooner than that.

It took Reclamation far too long, in my opinion, to get started on that EIS process. We were modifying the studies, trying to make a five year research effort compress into a couple of years where the data collected would be useful in an EIS process. It was frustrating. Most of the researchers on the river were about ready to throttle the Bureau of Reclamation for not being able to get it right the first time and get on with things. We designed a set of research flows, because now we didn't have five years to take a look at whenever the flows occurred. We designed research flows over a thirteen month period, to vary the flow, to look at what happens when there are high fluctuations, low fluctuations, constant flows, high minimums, low minimums, all that type of thing you might expect us to be looking at under research. Again, strangely enough, not everyone was satisfied. There were people who said, "No, it's going to take too long." "It's not going to take long enough." Every aspect of the studies and the EIS were under scrutiny, and I'll tell you, we really felt like we were operating in a fish bowl and still do. I think, in my view, at least, that's the name of the game. That's the way decision-making is, and that's the way it's going to be, and we might as well all get used to that.

We are scheduled to have a draft environmental statement ready in July of 1992. We've completed public scoping, during which we received 17,000 letters. We've just gone out with the public process listing our preliminary alternatives, where we got about 450 letters, commenting on the kinds of alternatives we've presented and how good a job our EIS team had done in formulating the alternatives. The EIS team is multi-agency, by the way. It includes many agencies, not just Bureau of Reclamation.

In the fall of 1993, we plan a final environmental impact statement followed by a record of decision. There's a lot of interest. We have, on a regular basis, a meeting of some ten cooperating agencies. I think I can name those for you. In addition to Reclamation, we have Western Area Power Administration, with the Department of Energy, we have the Bureau of Indian Affairs, Fish and Wildlife Service, National Park Service, Office of Environmental Affairs with the Department of Interior, and we have Arizona Game and Fish, and we have four Indian tribes: the Navajo nation, the Hopi, the Hualapai, and the Havasupai.

In addition, we have an interested parties group which we meet with about every other month, which is folks who follow the process. And every time we have one of those Cuisinart meetings, I host about twenty to forty folks in a room where we try to explain to them in a very open, informal question and answer type process, what we're doing, what the next steps are, what kind of progress we're making, and what our philosophies are in moving forward on the EIS. The cooperating agencies meeting, by the way, is something we feel is important and I think we're getting some credit for it in terms of being open, providing maximum information. Those aren't pleasant meetings. There are usually opponents sitting in the room, and strangely enough, many times it's this side of the room fighting with that side of the room. We sort of sit back and listen, because by the very nature of the controversy, they tend not to like each other.

The issue has major public significance. The stage is set for interesting dialogue, as you might well expect. It truly is centered on values, the values that the nation places on hydropower versus the values the nation places on the Grand Canyon. One of the real challenges we have is to try and keep the issue focused on the EIS steps.

There are some particular steps in the National Environmental Policy Act process. Everyone in this issue has a natural tendency to want to vote, to want to say what's right and what's wrong, vote this in and vote that out. NEPA, however, requires a more rigorous analysis, the development of a broad range of alternatives, an evaluation of all those alternatives, and then a selection. And it's very difficult to keep people from rushing to that decision day saying, "Pick my alternative; don't even consider their alternative." Very tough, over a two or three year period, to keep that step-by-step process in focus in the minds of the people who are helping us in the public involvement process.

The values are deep-seated, and I don't think that's a surprise to any of you. Let me simplify them. It's power generation versus environmental consideration. Gross simplification. Multiple issues on each side of that argument, but for me, that tends to frame the discussion of values. Those two are, I think, characteristic of the kinds of issues we are dealing with, certainly not the only ones, and I wouldn't want you to believe they are. But it helps frame this discussion.

The value of hydropower. In 1956, when the Colorado River Storage Project (CRSP) was authorized, construction began in the late '50's and early '60's. It was obviously a high value to the country. The Congress appropriated funds. Laws were passed. It's clean. It's efficient. It's reliable. All of those things are on the side of the value of hydropower. Some questions about that value. How much is enough? Should we meet an ever-increasing demand? If we meet it, where should that energy

be developed? This issue has high emotional content. I think it's characterized like this: you can either turn out the lights, the heat, and the air conditioning, or you can destroy the Grand Canyon. That's how emotional it gets. It's not that simple, but I think both sides use that emotionalism, and they use it pretty well. Want to talk about the values in the Grand Canyon? Fine. Turn the lights out and talk about it. Do you want to talk about the need for energy? Fine. You know. Tell everyone the Grand Canyon is no longer there. You can't float down it. The beaches aren't there. There's no place to stop. That's a highly emotionally charged issue, and unfortunately, in my view, that becomes the focus of this debate. It's not that simple, but it's certainly the kind of focus that we're getting in the debate.

Do we really need the electricity? Again, hot debate. What are your values? Energy conservation has broad support. Could conservation solve the problem? Not likely, in many people's mind. Is the alternative that we don't develop any new energy and live with what we have? If that's the case, as it is in the water supply issues in the Colorado River, are we going to meet our future power needs? Or are we going to say, "No, that's all there is. Let's manage within our basin", as the mayor of Missoula suggested to us yesterday. Will we meet them at all? How might price affect the demand? Is federal hydropower underpriced? It's certainly priced according to the law. Somebody thought that was the right price. It's priced at cost. Is it a subsidy? Leave that to your judgement. Depends on your values. But if it were priced differently, would the demand be the same? Should current law and policy be changed? If you don't provide the power at Glen Canyon Dam, and you decide to provide it, where will it be provided? Will you build a nuke somewhere? Will you bring another coal-fired generator on-line? Will natural gas combustion turbines be the answer? What's that all about? Depends on your values.

Environmental considerations are varied: beaches, endangered species, archaeological resources, riparian vegetation, wildlife, the overall ecosystem of the Grand Canyon. Many of those issues, particularly power generation, but also recreation, they have a market value. You know what those things are. You can go out and buy one. You can buy a trip to the Grand Canyon. You'd have to bring your checkbook, but you can buy one. You can buy electricity. You can buy thermoplants. They have a value that's monetized. How do you compare that with what we call non-use values? What's the value of a humpback chub? Or sand on the beach? Or the beach? Or the archaeological resources of the Grand Canyon? Or the existence value of the Grand Canyon? It's there. And my future generations can enjoy it, your future generations can enjoy it.

There's a value there called a non-market value, and there's a heavy debate over whether you can take these market values in dollars and compare them with these non-market values somehow converted to dollars, and can you say, "Yep, that balance is about right." There is tough debate on should you do it, let alone can you. Is it effective? Is it fair? Difficult debate.

Beach structure in the Grand Canyon seems to be the key. It seems to be the basic question. What are the impact of the flows, both fluctuating flows and flood flows, on beach erosion? Seems to become the focal point of what's going on in the Grand Canyon.

In general, this whole issue, in my view, is a value weighting issue. Here's the complexity:

everyone's values are the most important. Yours are, and yours are, and yours are. Everybody's values are the most important values. There isn't any comparison. How do you compare the values of one person, one group, one sector of society versus the values of the other. It's very easy to get into, "I'm right, and therefore you must be wrong." And vice versa, obviously. The key is that both sides of this argument, power generation versus environmental consideration, feel similarly committed. It results in polarized, strong emotion, sometimes hostile, and I'll tell you reasoned judgement in situations like that is very difficult, very difficult.

The process is well under way. Reclamation's objective is to develop a quality environmental impact statement. It's serious business. The evidence of that is the major public concern. What we're trying to do is prepare so that a well-reasoned decision can be made and documented at the end of the process. Reclamation probably isn't going to make that decision, and it shouldn't be of any surprise to you, it'll be made at much higher levels than we can reach. We recognize the challenge. We're committed to the best job possible. We think we're going the extra mile: we're meeting with interested parties, we're discussing the philosophies, we're trying to get people to focus on as many facts as can be put on the table rather than focus on that emotional level. That's a very difficult task. We recognize that the decision will have major and significant impact upon hydropower and environmental resources in the basin for years to come.

There are a few other issues I would like to touch on. A number of other kinds of situations have begun to occur in the Colorado River Basin that are affecting the way that decisions are made. One of the most significant is the Endangered Species Act, and I know Reed is going to give you a lot more insight into that a little later this morning. One of the things that we see is the Endangered Species Act is becoming a significant issue in Colorado River operations. We are seeing requests and requirements to change proposed actions, change projects, change operations, to change mainstem reservoir operations. And the philosophy we're seeing come out is to return to natural hydrographs -- higher spring flows, lower late season -- and these have primarily to do with the bigger fish, the endangered species in the Colorado River mainstem.

One of the questions I would pose is, if we go back to high spring flows, low late season flows, and we require our reservoirs to operate in that manner, we're really going against the very reason that those reservoirs were there, which is to store high flows and release it in late season for use. So there's a real dichotomy. There's continued objection to peaking power operations and resulting fluctuating flows.

One of the questions I'd like to pose, and maybe Reed can at least address it, and I'm sure we'll have plenty of questions about it. How much will be enough? How much change back to historic conditions will be enough? Will we return to historic conditions all the way? Will we manage primarily for endangered species in every stream? Unanswered questions, obviously, but I think good food for thought. A major task for all of us is to react to the new thinking on the river. Find solutions, help facilitate and define acceptable current public view and assure careful decision-making. That's the way I see the challenges of what the Bureau of Reclamation can do in its future. A major challenge for

Reclamation, and the states, is to find a more balanced approach to decisions and subsequent operations in the Colorado River System.

Glen Canyon Power Generation and Environmental Protection

Dave Sabo

**.Manager of Environmental and Public Affairs
Western Area Power Administration, Salt Lake City**

Lucy High asked me to briefly discuss some of the environmental issues confronting Western Area Power Administration. She also asked that I share Western's perspective on what these issues may mean to us and to our customers. Before I talk to those issues, let me set the stage for you to understand Western.

To help you understand Western's perspective, I'm going to go through some of the regulations which we operate within and the goals and objectives that we as an agency have set to accomplish those regulatory mandates. With that stage set, I'll delineate environmental issues and our perspective on them. And then finally I'll give you, at least from my perspective, some points for consideration that you should bear in mind as these topics are discussed and debated here in the near future.

Western is a power marketing agency, or PMA, within the Department of Energy. Western was formed as a part of the DOE Reorganization Act of 1977, which separated the power marketing functions out from Reclamation, then in the Department of the Interior. Western has five area offices that are charged with marketing and distributing federal hydropower generated at various projects within fifteen states in the western U.S. Western's mission is to implement national energy policy by maintaining a viable marketing program for federal hydropower over an efficient, safe, and reliable transmission system while protecting the environment and encouraging conservation and the use of renewable resources.

The Salt Lake City area markets federal hydropower generated at dams on the Colorado River Storage Project (CRSP). We also have several integrated projects that are associated with our marketing programs. In total, this includes ten hydropower dams selling ten billion kilowatts of energy each year. Western sells its power to generation and transmission cooperatives, rural electric co-ops, irrigation districts, municipalities, and federal facilities, those entities which are not-for-profit utilities. Rick held up a copy of Time Magazine, which characterized Western as selling for a profit, and that's not true. The customers of the Salt Lake City area reside within a five state region surrounding Utah and also include a small portion of Texas. We do market power within Colorado.

Western follows the legislative mandate set forth in key Congressional acts. By way of background, I think you really must understand the project funding aspect. I'll try to get through this fairly quickly and not bore you to death. The Reclamation Act of 1902 authorized a program for constructing dams and water systems for irrigating the arid West. That's why a lot of you are here. That act also authorized establishment of the reclamation fund that was designed from the beginning to be financially self-sufficient by recovering revenue from the sale of public lands in the West plus using user's fees and appropriations. Specifically, reclamation would use money from the fund to construct projects. Then, when completed, the fund was to be repaid by those benefitting from the water. This

concept lasted only until it was determined that water revenues would not be sufficient to repay irrigation investments.

In 1906, Congress passed the Townsites and Power Development Act, which authorized the sale of federal hydropower, and gave preference to municipalities for its use to repay the fund. During the Depression era, project beneficiaries, principally farmers, defaulted on their federal repayment obligations, and subsequently, Congress thought to extend the repayment obligations and provide relief to them through three various acts. But this did not change the situation. By this time, the project had grown to such size that it was beyond the repayment capability of the water users.

The Boulder Canyon Project Act of 1928 authorized the construction of Hoover Dam, a huge project, whose purpose was to restore and conserve Colorado River water, a resource already confined to strict limited use by the Colorado River Compact of 1922. Hydroelectric power at the dam was installed specifically to assist in the repayment of the unprecedented cost. In keeping with Congressional intent that reclamation projects be self-supporting, no work was allowed on the Hoover Dam Project until contracts were in place for the purchase of all of its power and water.

The Boulder Canyon Project also incorporated the concept of multi-purpose development of water resource projects to include not only considerations for irrigation, the prime reclamation purpose, and hydropower generation, a secondary consideration, but also municipal and industrial use, flood control, fish and wildlife mitigation and enhancement, water quality improvement, and recreation. Costs were allocated among these various users, with hydroelectric power paying its share and a major portion of the amount assigned to irrigation.

Since that time various reclamation and flood control acts, especially the Reclamation Act of 1939, have continued to direct the marketing of federal power to insure an equitable and timely return to the U.S. Treasury of appropriations advanced for project development. That return traditionally has included the repayment of annual operating and management expenses, construction investment with interest, and other fixed charges specified in the 1939 act.

Now let me mention several really important acts that pertain directly to the present discussion. First, Rick Gold went through the Colorado River Storage Project Act of 1956. This act, among other things, authorized the construction of certain dams, including the Glen Canyon Dam, the use of upper basin states' allotments of water, the direction for the use of generation of power and energy to repay the construction costs in that order. Also included in this important act were the secondary purposes of flood control and conservation, fish and wildlife enhancement, and recreation.

The hydroelectric power features of the project were of such interest to the upper basin states that three of those states, in commenting on the proposed project, wrote that, and I quote, "The hydroelectric plants of the Colorado River Storage Project should be operated in conjunction with other power plants, present and potential, in such a way as to produce the greatest practical amount of power and energy that can be sold at firm power and energy rates." They were concerned that the procedures for power generation be established that would produce the greatest future benefits possible for the upper basin states from CRSP power. Language in all the CRSP bills then before Congress reflected this concern as well

as the then present power policy of Congress that required that the large, multi-purpose projects utilize the water resources to the maximum in the generation of power without impairing the use of the project for irrigation, municipal and industrial water, or flood control. That language was written into the act.

The Colorado River Basin Project Act of 1968 is another important act that expanded on the CRSP Act, specifically for the usages of water. It authorized the Central Arizona Project (CAP) and the acquisition of lands for the CAP. Contrary to what some individuals may espouse, the Basin Project Act strengthened the priorities of use outlined in the CRSP Act. That is, power operation has priority over certain other issues. Specifically, Section One of the Act states that nothing in this act shall be construed to alter, amend, appeal, modify, or be in conflict with provisions of the CRSP Act. Additionally, 602C of the Basin Project Act entitled "Power Plant Operations", states that, "Section Seven of the CRSP Act shall be administered in accordance with the foregoing criteria." These laws then form the basis for Western's objectives: that is, to produce the greatest amount of power and energy that can be sold at firm power and energy rates.

In keeping with the previously mentioned regulations, and its mission statement, Western has developed power marketing programs to accomplish the task of repayment of project expenses through the sale of power. Primary among these programs is the sale of firm power and energy pursuant to the acts. As mentioned, these sales are made to rural electric cooperatives, municipalities, and irrigation districts, among others, not to private utilities which operate to make a profit. Western's customers are, for the most part, serving the rural West. Western also markets short term energy on the spot market when it has surplus capacity. The sale of firm power and energy is made according to certain criteria. Those criteria define the terms and conditions of the sale as well as who gets the power.

The Salt Lake City area office has three major public processes confronting it. These are first, the electric power marketing EIS, which I'll go into in a little detail in a second. Second is the Glen Canyon Dam EIS, which Rick talked about, and third are the Section Seven consultations under the Endangered Species Act ongoing at Flaming Gorge Dam and soon to begin at the Aspinall Unit, which my friend Reed Harris here is going to talk about. Let me elaborate a little bit on the three processes.

As I mentioned, Western sells power according to specific criteria. In 1980, Western began a public process to evaluate and modify those criteria. Through the early 1980's, Western held numerous public meetings, seeking public input on its criteria that would be the basis for the new firm power contracts to take effect in October of 1989. The marketing criteria was finished in 1986, supported by an environmental assessment and a finding of no significant impact. Subsequently, Utah Power and Light, along with 150 of its customers, filed suit against Western on a number of issues, including whether adequate environmental compliance under NEPA had taken place, with regard to those post 1989 criteria. After most of the issues and the law suit were won by Western, and settlement was proceeding on the remaining issues, the National Wildlife Federation and three other environmental and recreational organizations filed suit against Western, again alleging that Western had not adequately complied with NEPA. Prior to the ruling in that case, Western committed to complete an environmental impact statement on the marketing and allocation criteria. The court accepted that commitment, and required

Western to incorporate certain analysis in the EIS. Also, the court suspended the post 1989 marketing criteria, and ordered certain modifications to the new firm power contracts. These contracts did, however, go into effect in 1989. So, in order to explain the distinction between the two environmental processes, which I know will cause a lot of confusion, I'll go through what we're doing with our, with Western's power marketing EIS, and then talk a little bit more about Glen Canyon.

This EIS will address the following: the cumulative impacts on the environment and on power plant operations as a direct result of the Salt Lake City area integrated projects electric power marketing program; the impacts of CRSP power plant operations as a result of Salt Lake City area integrated projects electric power marketing programs; the impact upon the local and regional environment, including among other things, endangered and threatened species; impacts on recreational interests; power consumers' interests; air quality; and cultural resources.

Western will be developing alternatives within and to the Salt Lake City area integrated projects electric power marketing program, and the resultant CRSP power plant operation. Consideration will be given to connected actions, including but not limited to conservation and load management measures, power scheduling and transmission constraints, and rate design. Also included as a connected action is the provision of project use power. Finally, the EIS will develop mitigation measures for adverse environmental impacts of both a discrete and a cumulative nature associated with the Salt Lake City area integrated projects electric power marketing programs and the resultant CRSP operations for hydropower generation to the extent such impacts are identified.

The implication of this particular EIS could have far-reaching effect on Western's resources and its customers; however, it's too soon to determine what those impacts might be. Western's electric power marketing EIS is currently scheduled to have alternatives developed and presented to the public by October of this year. The draft EIS is scheduled for release in the spring of 1992, and the final EIS should be completed by late 1993.

The next concern to Western is the Glen Canyon Dam EIS and the Glen Canyon Environmental Studies (GCES), which Rick went through in some detail. The intent of that process is to assess the impacts of Glen Canyon Dam and the operation of Glen Canyon Dam on the downstream environment within the Grand Canyon. As Rick mentioned, this process began in the early 1980's with the GCE Study Phase One. Then in 1989, the Secretary of the Interior ordered that an EIS be prepared on dam operations. As Rick mentioned, Reclamation's schedule expects completion of that process in late 1993.

Of immediate importance to Western and its customers are the impending commencement of interim operations at Glen Canyon until the EIS is complete. The impacts of interim operations could have a significant impact upon Western from both a resource perspective and from a legal perspective. Should the interim releases be significantly different from current operations, the flexibility of Glen Canyon will be lost and Western will be unable to meet its statutory and contractual commitments.

I also mentioned the third process which is under way, and that's the Section Seven consultations at Flaming Gorge and the potential for consultation at the Aspinall Units. The U.S. Fish and Wildlife Service has been in consultation at Flaming Gorge since the early '80's. Fish and Wildlife has announced

its intent to issue a biological opinion on the operations at Flaming Gorge by this coming fall. That biological opinion will require that the operations at Flaming Gorge be constrained or changed during particular seasons. The report, which contains the recommendation for future operations, has just been finished, and we've not yet had an opportunity to assess the exact impacts on our generation resources or costs.

However, let me quantify some of the costs that we're talking about with all three of these processes. The cost for preparing the marketing criteria EIS is in the vicinity of 12 million dollars. As I mentioned, it's too soon to predict what the impacts, as a result of that EIS might be, and how those costs might stack up. When Glen Canyon Dam EIS is complete, and Phase One and Phase Two of the GCS studies are done, over 56 million dollars will have been expended. Interim flows, when initiated, could have the effect of costing as much as 30 million dollars per year. The Upper Colorado Endangered Fish Recovery Implementation Program is costing Western approximately 1.5 million dollars per year, and has for the past four years.

These costs are overwhelming when you consider that the sales of CRSP resources result in slightly over 100 million dollars per year of revenue. It is overwhelming to Western's customers who must foot the bill for all of this. Western implemented a 46% rate increase last October, and has begun the process to increase rates again, actually, as soon as possible. Western has been unable to repay either principal or interest to the basin fund for the past two years, and the future looks no better.

What does all of this mean? First, from a narrow perspective, it means Western's customers are going to be hard hit from a cost standpoint. Second, it could mean that Western's power and energy may become too expensive and possibly not a value to its customers. That is, it may not be the type of power they need. Third, it means that society's values are changing. That is, all of the intents delineated in those acts that I mentioned earlier, that it is to provide water and power to the West, have changed. Or at least they're in the process of changing. I'm not arguing that this is right or wrong, I'm only observing that at least some components of our society have become so concerned with preserving the environment, that they may feel that it may be appropriate to negatively change the use of renewable hydropower and depend on other non-renewable resources with the associated impacts from those non-renewable resources.

As a biologist myself, I strongly agree with preserving and protecting our environment. But my greatest hope is that all parties will agree to strike a balance; that is, that the dams will be used in such a fashion to prevent further dependence on non-renewable resources, while at the same time appropriate resource management techniques can be applied to preserve the imperiled environment. Such things as non-operational alternatives and mitigations must be considered. Beach armoring and sand pumping, for example, to restore the beaches in the Grand Canyon should be considered, along with the changes in dam operations.

Finally, while consideration is being given on all these processes to the many dams of the Colorado River, we must bear in mind that we have forever changed the natural environment around those dams by our actions. We cannot go back to what was before. Instead, as stated in Brian Brian

Brown and Stephen Carruther's new book, "The river is no longer natural. Instead, it is naturalized, a blend of the old and the new, a mixture of native and exotic organisms." The authors assert there's currently no guidance for coping with naturalized ecosystems. The challenge is then for us to develop and correctly manage this new environment.

Endangered Species and River Operations

Reed Harris

U.S. Fish and Wildlife Service

I'm happy to be here today to speak to you for just a minute about a subject that's not only important to me from the standpoint of my livelihood and my career but also one that's important to me based on my own value system. I am an environmentalist. I'm not a nasty environmentalist, like you heard about last night, and as we talk about some of the ways that the U.S. Fish and Wildlife Service deals on issues related to endangered species in the Colorado River Basin, I think you'll see that our approach has been one of trying to find out, based on scientific needs, what best we can do to protect the species in its habitat.

We've captured Colorado squawfish in the upper twenty pound range, upwards of thirty-nine inches long. These are some of the bigger fish that we find in the system today. There have been archeological findings, bones of the fish, that, when reconstructed, indicate that the fish may reach lengths of up to six feet and eighty pounds. Formerly, squawfish lived throughout the Colorado River Basin. Now, it basically has been extirpated from the lower Colorado River. It still exists in the upper basin in the San Juan, Yampa, Green, and upper Colorado Rivers, but its numbers have been dramatically reduced.

Humpback chub is another endangered species. The limited distribution of this fish shows that there are a few areas up around the Green River-Yampa River confluence, Cataract Canyon, Black Rocks, West Water, and a very good population down in the Grand Canyon.

A relative to the humpback and round tail which are fairly common out in the stream is the bony tail. We don't find many bony tail today. Of all the fishes, this is probably the one in the Colorado River system that could well be on its way out. We currently have some genetic studies going on now to look at this fish, the round tail and the humpback chub, to determine their taxonomic structure, and to try and determine how much speciation has taken place in the fish, to better be able to help us manage this species. There are several areas where the bony tail may still be found, probably some of the best populations that exist today are down in Lake Mojave and Lake Havasu, living in reservoirs. The fish live to be twenty, thirty, forty years old. Most of the fish that we find nowadays are old adults, especially the ones that are living in reservoirs. They're not reproducing, and once they die, that will be the end unless we can somehow get them to reproduce successfully, either in an artificial situation or in the wild.

Here's one that only a mother could love: the razorback sucker. The razorback sucker is proposed for listing as an endangered species right now. We're in the process of making an evaluation. We have delayed somewhat making that final determination for right now because of concerns about critical habitat, and other issues, but hopefully we will make a decision fairly soon on the listing of this species. I don't want to show you a lot of slides about river systems and dams and those sorts of things

because I'd rather talk generically to that.

Maybe I could give you some idea in a general sense what our concern is. If you'll take a look at this particular graph, which shows the Green River at Flaming Gorge Dam, the change in hydrology that occurred between the pre-impoundment in 1956 when the natural hydrograph, as Rick called it, prevailed on the river system, versus what happened once the river was regulated, which is shown in red. No doubt about it, the Bureau of Reclamation has in many cases, created some of the finest trout fishing around, below some of these impoundments, and the Green River is no exception. Probably one of the finest places for me to go out and fish for trout is the Green River below Flaming Gorge. Unfortunately, this is the kind of river system we need to protect native fishes. Here are some researchers in an Electra fishing boat out trying to capture some of the fishes. This represents the kind of water that we may need for migration, for spawning, and other things.

Just a week, ten days ago, we spent some time with a group talking about the value of this species. I anticipate that those are the kinds of questions that will come up. How much do you need? When will be enough? What's the value of this species? Didn't you once poison them? I guess there's a lot of things that I could philosophize about relating to this, but I guess I would just rather indicate that the species means a lot to me personally because it's part of my natural heritage. It's the natural heritage of my children, and their children, and the thing that I want to do is preserve not only the species, but as the Endangered Species Act says, to preserve the habitats on which those species depend. This is a habitat upon which those species depend, and I have to find a way to preserve that.

I live in Salt Lake City. I grew up south of Salt Lake City. I'm used to living in an agricultural community. As a boy, I remember going down to Utah Lake and catching a large number of June suckers, which are now also on the endangered species list, for a number of reasons. I certainly understand water use, I think, as much as most. I recognize that sometimes choices have to be made, and sometimes those choices have to be made between two good things, not always between one good thing and one obviously bad thing.

I've been asked to talk about Section Seven today. Many of you are already familiar with it, and rather than get into specifics of the Endangered Species Act, talk about opinions and all those sorts of things, I'd like to talk a little bit more about the intent of the act, and how it may specifically apply here. As many of you know, any federal agency that has an action that is pending that could have an effect on endangered species, must undergo Section Seven consultation. We do a lot of informal consultation with agencies as well as what we call formal consultation if the agency determines that there is a may-affect situation. In the cases of private developers or states or whatever, they also become involved in the Section Seven process if they require federal permit or license or approval. So basically, with water development anywhere in the West, you're going to need a 404 permit, you're going to do some sort of NEPA compliance, you're going to need a right-of-way to go across BLM land, something is going to normally require some sort of federal action, and therefore, would require that you get involved with the U.S. Fish and Wildlife Service through a federal agency, which then would be called the action agency.

Congress, subsequent to the passage of the act, recognized there were conflicts coming up. There

were a couple of ways that they tried to deal with that. One of them was through some amendments to the act which called for the Service to develop reasonable and prudent alternatives. If it was a jeopardy situation and nothing else could be done, we had to develop some sort of reasonable and prudent measures which if implemented, would allow the action to go ahead and take place. They also had a separate process that they called an exemption process that someone could take. But short of getting the entire Cabinet of the United States together and voting that this is such a high priority, the exemption process doesn't really prove to be a very effective way for people to get around compliance with the Endangered Species Act.

As it relates to water development out on the river system, the consulting process really started in a major way in 1977. And in that point in time I was working with the Bureau of Reclamation. We were working out on the Dolores Project, and it was nearing construction. They were ready to turn dirt, and the Fish and Wildlife Service basically in a meeting with the Bureau of Reclamation had determined that their actions might jeopardize the species in the Colorado River system. Not just in the depletion of Dolores but a number of other actions that were going on. So at that point in time, we came to agreement with the Bureau that in order for them to go ahead with the project and proceed with construction, they would need to be able to set aside at some future date their total depletion or some 131,000 acre feet of water to be delivered from some other facility, which meant Dallas, or Aspinall, or one of the other facilities in the basin. They would also have to come up with enough money to find out what the fish's requirements are.

From that point in time, I think the Service's position with respect to these fish was very clear. We were trying to find out what the requirements of the fishes are. We were trying to then hold in reserve enough water to provide for the fishes once those flows had been determined. And, based on those discussions, as you well know, the Dolores Project went ahead.

There were a number of other projects that were treated in a similar manner. The Bonneville Unit and Collection System over in Utah had to keep in reserve 108,000 acre feet of water. Dallas Project, 17,000 acre feet. The Jensen Unit, 15,000 acre feet. In the cases of the projects over in Utah, the water was to be maintained in Flaming Gorge Reservoir for release. We started at that point in time to do research, and the research, just like Glen Canyon, has come in spurts. We originally started the Colorado River Fishery Project, which started in '79 and went through '81, '82. Then we had a monitoring program that went on for three years. And then subsequent to that we have what we call a Recovery Implementation Program (RIP) for the Colorado River fishes, which John Hamill will talk about a little later, and over which he is basically the Executive Director. All these programs were undertaken with the idea of trying to find a way to take care of the issues of depletions out of the system and at the same time deal with the protection of the species.

We came to the conclusion at the time of the writing of the RIP that depletions in the system probably didn't have a major impact on the fishes as did the regulation of mainstem reservoirs. We include in the Recovery Implementation Program the responsibility that the federal agencies had to go back and look at the operation of those major facilities: Flaming Gorge and Aspinall being the two major

ones. The original concept that we agreed to was that we would look at all operating projects, Glen Canyon and Navajo being two that are being looked at in a different fashion, different time. The idea here was again, to look at them to see what the fish required. In most cases, what we're coming up with is that we would like to see at least a turning back toward a natural hydrograph, or a normal regime that the fish basically evolved to ecologically and biologically.

We run into another problem at Flaming Gorge. There's load following at Flaming Gorge, and the daily peaks at Flaming Gorge can be much greater than depletions, 100,00 or 200,000 acre feet over a year off of the Bonneville Unit. The major changes that occur in a river system come in the daily fluctuations. The research is expensive, it's time-consuming, and as you can see the system that we're working isn't the easiest to try and get the information that we need.

I want to go into some of the specifics of these projects. You've heard about Glen Canyon today. Our main concern in Glen Canyon now is humpback chubs down around the Little Colorado River. And I think that, as Rick has told you, they're dealing with that basically with our Region Two out of Phoenix.

Flaming Gorge. We're in the process now of preparing a biological opinion on Flaming Gorge. The details will depend on a study that's just been completed called the Consolidated Biological and Hydrological Report for Flaming Gorge that should be out within a month. I've seen basically the final draft of it. We're in the process now of trying to get it printed. And anyone who has an interest in receiving a copy of that certainly can have it. We anticipate that that opinion will constrain operations. It will constrain the summer-fall flows, to provide for better nursery habitats for these fish, as well as provide for some test flows in the winter and springtime.

Lucy asked me to address how this might affect other resources, but I don't want to jump out ahead of what our opinion will say or speculate on maybe what kind of impacts will be happen to the system. I can only indicate that we have had what we call test flows on Flaming Gorge for the last four or five, six years, with reduced flows in the summertime. Basically, I think if Reclamation were here, they would indicate that the drought that we've had over the last few years probably had more impact on conservation of the water than have any of the flows that we've recommended. I don't think it has affected, conservation of water, which is the main and primary purpose of the CRSP system. Fishing and rafting may have been impacted somewhat, but we have noted that larger and larger numbers of people are using the river system both in La Gore Canyon and below Flaming Gorge Dam for fishing and recreation. Those industries didn't seem to be impacted too much.

Western Area Power Administration (WAPA). I think maybe the first year was kind of a fluke in that WAPA was storing extra water and happened to be able to sell the water for even a greater value during the wintertime. I don't think that the first year of operation under our request was actually adverse to Western. But I do know that it reduces their flexibility to market power when they want to market power. And I think if there's probably one area where we're going to have a rub with regard to changing flows, it's in terms of Western's flexibility and their marketing of power. We're interested primarily in the Jensen area downstream, which does lead to some flexibility for operation at the dam.

We're not going and telling people how to operate the dam specifically, but instead we target habitats that are occupied by the fish and where we need the flows.

The Aspinall Unit. Studies are just beginning on the Aspinall Unit out here. We know quite a bit about the Gunnison and the Colorado River systems. We're starting to make flow recommendations regarding those systems. They're going through peer review, and hopefully, it won't be long before we'll be able to complete our studies in relation to the Aspinall Unit and to make some sort of recommendation on what flows we feel are required there. The one thing related to power on the Aspinall system is that most of the power that comes from there is not a load following, at least as I understand it. So the implications of these studies to power are probably not as ominous as they are over in say Flaming Gorge.

Navajo, I don't know quite what to say about Navajo. Recent events there are related to construction of the Animas/La Plata Project. It's not covered under the Recovery Implementation Program. We're continuing negotiations now with a number of the users, trying to get a signed memorandum of understanding (MOU) which would allow Reclamation to go ahead and to start construction of their project. We had worked with Reclamation regarding some sort of back-up system, and although there is no specific amount of water dedicated for final release to the fishes, after a seven year study period, we'll be able to indicate how much water we think needs to be released for the fishes. And we're looking again here at providing extra water out of the reservoir to be released at times when water has not traditionally been released, in order to preserve the habitats. We have caught a number of adult squawfish in June on the San Juan River, and one of those fish died. They were radio-implanted, and three of them were being followed to hopefully give us more information about where the fish spawn and a little bit more about their life history so that our recommendations can be scientifically based.

The final question that was put to me was, should protection of the endangered species determine the operations of the dam? I would like to respond back with a question. Should our nation's rare fish and wildlife resources not be taken into account when we're looking at the use of facilities that were built with public funds and were operated with public funds, to a large degree, and they're a public trust resource? It is not our intention to dictate the operation of facilities in the Upper Colorado River Basin. It is not our intention to hurt other resources. But our first and foremost thrust is protection of endangered species, of which the fish only represent a small number, to preserve the habitats on which they depend and also to protect what we deem to be important, not only for the future, mine and your future, but the future of our families.

Implications of the Re-Evaluation of River Systems Operations

Jim Lochhead

Colorado Water Conservation Board, Upper Colorado River Commission

We've heard about four areas of change in Colorado River operations. Rick Gold talked about the opening up of the annual operating plan and operating criteria processes, and about the reassessment of operations at Glen Canyon Dam. Dave Sabo spoke about the impacts on historical patterns of power operations as a result of the Western EIS, the Glen Canyon EIS, and Section Seven consultations that are on-going on the river. And of course, Reed Harris just spoke about the impact of those Section Seven consultations on reservoir operations. Yesterday, we heard a friendly discussion between Marc Reisner and Greg Hobbs about the challenges of meeting future water supply needs in an environmentally sound manner and the way that we can go about that. I think those discussions illustrate the conflicting and indeed, in almost all cases, diametrically opposed interest in system operations and the difficulty that managers and operators and public interests have in trying to balance those interests.

The endangered fish need high spring flows and stable lake flows. They need warm water. Rafting recreation industry needs high late summer flows and stable flows. Flatwater recreation requires full reservoirs. Trout populations require stable clear flows and cold water. The power industry requires load following, which necessitates rapid fluctuations in river levels and reservoir levels. The water allocation interest, because of the high degree of regulation that exists in the system is probably the most flexible interest and able to accommodate a greater range of these interests than any of the other values that I've illustrated. I think we have to remember, however, that under the law of the river, those water allocation interests remain primary. In all cases the scapegoats for those who would advocate changes in system operations have assailed the power and the water interests and in particular irrigated agriculture. They've also assailed the federally subsidized operations that have historically been undertaken to benefit these interests. I think it's no longer arguable that these operations need to be reassessed in order to accommodate other values on the river. However, we cannot simply toss hydropower aside, irrigated agriculture aside, or the prior appropriation document aside, in order to achieve a better balance in operations.

If you look at the power operations, the basis of the Colorado River Storage Project, the basin fund, was designed by Ival Goslin to pay for project construction, to allow for the development of water in the upper basin, while at the same time allowing the upper basin to meet its obligations under the Colorado River Compact. There is a total repayment obligation under the 1956 CRSP Act of about 2.5 billion dollars. That repayment obligation is for water project construction. This amount represents an obligation by the United States Treasury to reimburse projects already built, projects under construction, and projects to be constructed in the future. About a billion dollars of this repayment obligation is for projects that have already been constructed. About six hundred million dollars of this repayment obligation is for projects that are under construction. This repayment obligation is paid for by power

revenues generated at these facilities.

Contrary to popular belief, most of the CRSP power produced does not go to Los Angeles or Phoenix. It is used in the Upper Basin primarily by rural interests. Reducing the peaking power demands and production in the system will force a shift in the market for that power to other areas, possibly to Phoenix and Los Angeles, and will force Upper Basin utilities to look to other sources such as coal-fired power plants for power generation. Additionally, if the Upper Basin Fund is bankrupted, the United States Treasury will be shorted as much as 1.6 billion dollars in repayment revenues over the next 20 years or so.

Secondly, irrigated agriculture is not the only subsidized feature of system operations on the river. In fact, fish and wildlife and recreational values and benefits are non-reimbursable. Despite the value, and there is a true value ascribed to these uses, they do not repay any of the federal investment in the facilities which are made to create those benefits. Obviously, the system has created problems as well.

Well, where do we go from here? It's clear that there are going to be changes in river operations. It's also clear that there have to be ways to achieve a better balance in those operations. It's also clear that there will be changes in operations, with and without the participation of the Colorado River states. I'm happy to report to Marc Reisner that a lot of the changes that he has advocated are already occurring, and they're under discussion between the states and the Bureau of Reclamation. I think that those changes in operations that we're talking about, however, can be undertaken without dismantling the Prior Appropriation Doctrine, without renegotiating the Colorado River Compact, and without altering the primary water allocation functions of the law of the river.

Last year, the water interests of the seven states successfully reached agreement with the environmental interests on language in the Grand Canyon Protection Act, which would formally open up the planning processes on the Colorado River to the full range of public interests, and which would allow the adoption of interim and long range operating criteria at Glen Canyon Dam, which would alter operations to enhance the canyon environment while preserving the primary water allocation functions of the system reservoirs. That negotiated language has been introduced by Senator McCain of Arizona in this session of Congress. The states have continued to stand behind that language, and they support the adoption of that bill.

Additionally, in February, in response to requests by California to, in essence, perpetuate its dependence on over-deliveries of Colorado River water, Governor Romer proposed formal discussions among the seven Colorado River Basin states to address several long range issues. In your packet, I have provided a few handouts. One is a series of charts that were produced by the Upper Colorado River Commission that illustrates California's continued and increasing demand for Colorado River water and also illustrates that the situation in Southern California is not a matter related to the California drought. The Southern California coastal plain is going to require about a million acre feet of water between now and the year 2010, in addition to a firm supply that it would get out of the Colorado River through its existing aqueducts. To put that million acre feet in perspective, the firm yield of the Denver system is about 300,000 acre feet, about a third of that, so we're talking about three Denvers is what L.A. area

will need in the next twenty years.

The second handout that I provided is a copy of Governor Romer's letter to Governor Wilson in February which initiated the process where hopefully the states will get together to discuss and resolve some of these long term issues. Governor Romer expresses a willingness to cooperate on issues on the Colorado River on four premises. First, that the discussions should be undertaken on a state to state basis. The discussions in water allocation decisions on the Colorado River should not be made by private water marketers, but should be made by the states based on public policy. Second, the entire purpose of Governor Romer's initiative is to preserve and affirm the entitlements to the upper basin states and in particular Colorado under the law of the river. It is not a desire to renegotiate the Colorado River Compact and it is not a desire to provide for a perpetuation of overdeliveries to California. Third, Governor Romer proposes that California undertake a program to reduce its dependence on Colorado River water down to its basic entitlement of 4.4 million acre feet and in essence to allow California to do that, Governor Romer's letter proposes a change in system operations whereby the metropolitan water districts of Southern California can receive a full water supply during that period of time while it initiates the types of programs that Marc Reisner talked about yesterday and which are already underway in terms of agricultural conservation and providing additional water available from agricultural transfers within Southern California.

It's basically the position of Colorado that the solution is available within California, that California can and should be in a position to solve its own problems without creating an open market for water in the Colorado River and particularly in the Upper Basin. Fourth, Gov. Romer's letter expresses a desire of Colorado to work with the other states in addressing several long term issues on the Colorado River, including environmental and operational issues that are of common interest to all of the states.

Pursuant to Gov. Romer's initiative, the seven Colorado River Basin states met in Torrence, California, in June and initiated the discussions. It is our hope that those discussions will lead to a meeting of the governors in November. At the June meeting, Colorado presented a draft conceptual framework for those discussions. Each state had an opportunity to provide an opening statement at the meeting. I think that I'd like to share with you a portion of Colorado's opening statement because it summarizes Colorado's position in terms of Colorado River operations at this time.

It is the view of Colorado which we believe is shared among the Colorado River Basin states that the issue of California's water use cannot be considered on a year-to-year basis, and California's request was in fact for a short-term supply of water for last year. They renewed that request for this year, and it's been the concern of the Colorado River Basin states that that request will continue from year-to-year. Rather this issue must be addressed by the states on a long-term basis for several reasons. First, the issue of a full water supply for the Metropolitan Water District of Southern California is not one which is related to the California drought. It is a result of continued growth pressures in the Southern California coastal plain, in combination with increased demands in Arizona and Nevada, which have pushed total demands in the lower basin

beyond seven and a half million acre feet a year. Second, no state benefits by addressing this issue on a year-to-year basis. The Metropolitan Water District of Southern California desires the assurance of a firm supply of water; the other states desire the assurance that continued overdrafts by Southern California over its entitlement will not, over the long term, reduce the water that's available for their use. Third, all of the states recognize that any discussion, even short-term, which ostensibly focuses on California's water use will necessarily implicate and involve other issues of direct long-term interest to the other states. Colorado believes it is primarily for this reason that the seven basin states were unsuccessful in resolving the issue of California's request for additional water in 1991, and why we would also be unsuccessful in any single year. Fourth, it is not in any state's interest for issues of vital importance to the states to be resolved at either a political or legal level in Washington, D.C. As direct representatives of the public uses on the Colorado River, the states must retain primary control over the operation and allocation of the river.

Colorado has prepared a proposed framework document, again that's in your packets. We suggested to the states that one of the primary goals for this meeting be the adoption of a framework document which will establish the basis for discussions that we can take back to our respective states for public input and subsequent refinement. By suggesting a focus of these discussions of California's water use, Colorado does not seek to preclude the discussion of other issues. We recognize that other issues will be implicated in these discussions. Rather, it is Colorado's view that this focus is appropriate, because it was California's request that precipitated these discussions, and because we believe these discussions have the greatest chance of success if addressed at resolving a narrow set of issues.

As you've seen, the issues both in their range and their political complexity, are enormous. I think if we are going to be successful at resolving any of the issues, we need to start taking discreet bites of these issues and resolving them one by one. It's Colorado's suggestion that the issue of California's overuse of water is the most immediate in terms of water allocation, and that's the one that we should start looking at immediately. We also recognize there are many issues pending on the Colorado River which threaten the structure of the water allocation and operation schemes established by the law of the river. It is not in any state's interest to play Russian roulette as to the outcome of these issues. Rather, it is in all of our interests to cooperate so that the mutual interests of basin states are best served. Therefore, it is hoped that these discussions will lead to greater cooperation and communication between the states on Colorado River matters.

Perhaps these discussions will lead to the formation of a more formalized forum among the seven states to consolidate our positions on operational issues on the river. Among the issues which may be addressed are Nevada's increasing demands for Colorado River water, the long-term security of the Central Arizona Project's supply and financial future; the maintenance consistent with conservation, of levels and systems reservoirs for recreational purposes; the optimization of operations, with water conservation and allocation remaining primary in order to achieve a balance among multiple purposes; and the ability of the Upper Basin states to develop the remaining entitlements in an environmentally

sound manner and at a rate dictated by need rather than a political fear, contrary to the law of the river and the compact which essentially secures to the Upper Basin the right to develop our entitlements when and as we see fit, that inequities will develop based on overuse in the Lower Basin.

The Colorado River states have an opportunity to proactively, rather than reactively, guide the direction of Colorado River policy. Colorado believes this opportunity will not last long. These discussions carry both political and legal risks, but the risks inherent in any agreement we reach are, it's Colorado's position, much less than the risks associated with non-cooperation which will result in the issues being resolved in arenas outside our control. As a result, I feel we have a tremendous challenge ahead of us in terms of river operations. Colorado recognizes that system operations must be developed in a more open forum to address a broader range of values. It's also Colorado's position that the law of the river and in particular Colorado's entitlement and ability to develop its water under the compact must be preserved.

Finally, it's Colorado's position that the states of the Colorado River Basin must be in a position to effectuate these changes rather than having them dictated by the federal government or by the courts. Colorado stands ready to enter into full and frank discussions on these with the other states and the Bureau of Reclamation on these issues, and looks forward to cooperative arrangements which can be developed to the benefit of all the states in the basin.

Implications of the Re-Evaluation of River Systems Operations

Dan Luecke

Engineer, Environmental Defense Fund

Some years ago, I realized that environmentalists were invited to conferences like this, not because of the substance of what we had to say but in hopes that we would say something controversial or perhaps unpleasant. Having listened to Mr. Miller last night, I realize now that if we're going to keep up with our colleagues in California, we have to get downright nasty. I hope I won't disappoint you, but I'm not sure that I can get as nasty as they are out West.

I'd like to step back for just a moment and describe for you what I think dams do, how we got to where we are right now, and then what it means if we start operating these dams a little bit differently. I think of dams something like automobile insurance. We're concerned in a way about a cash flow problem. We're willing to pay a little bit extra on a monthly basis, or on an annual basis, to take care of the accident when it occurs. And over time, if we take a look at the way in which we spend money, we really spend more on the insurance policy than we ever get back to take care of the damage that's done. At least most of us do. There is some risk-sharing and some pooling that's going on, but basically that's what it's all about. If it weren't, the insurance companies would be in worse shape than they are right now. And, given the shape they're in right now, maybe they're not doing a very good job.

Dams regulate the natural flow of a river. They also cause some loss of water in the system. However, what you get in exchange for that loss and for the cost of the dam is a reduction in the variance of the system. You take that enormous fluctuation out of the system. And that's what dams do for us.

Now, on the Colorado River, we have really gone to great lengths to take that variance out of the system. In fact, let's look back at a paper that was written in the middle 1950's by Walter Langhine, a hydrologist with the U.S. Geological Survey. Walter developed the little queuing theory model. He took his queuing theory model, and he showed that given the extent or the amount of storage in that system in the middle 1950's, (this is prior to when the CRSPA projects were put in the system) there was already so much storage in the Colorado system, that not only had the mean yield been reduced substantially, but the useful water, the available water, the firm yield, as hydrologists or water engineers like to describe it, had actually been reduced so that each additional unit of storage not only reduced the mean further, but actually reduced the amount of useful and available water. That's where we were in the middle 1950's. Now, here we are almost forty years later, with several more dams in the system and a lot more damage done.

From an environmental point of view, what are the effects of dams that we environmentalists don't like? You've really heard them from others already. One, they do reduce the flow, the amount of water available. Two, they change the shape of the hydrograph from something that is natural within a system to something that is very different from what is natural within a system. They change the temperature, they change the sediment load. There are a lot of other things, but those are the primary

characteristics that we're looking at.

Well, let's suppose we have overdeveloped this system. We are living with the sins of our fathers, but we are about to repent. We have seen the light. We are going to begin doing good. What can we possibly do? Well, if we change the way in which we operate the dams, we can change the hydrology. We're not going to get back that water that's lost primarily due to evaporation, although there are some diversions that are associated with the loss as well. We can change the hydrology. We're not going to change the temperature a lot, although there are some from the Fish and Wildlife Service who may disagree with that. We're not going to change the sediment load a lot. We can change it some. We can change the temperature some, but basically, we can change the hydrology. We can change the pattern of releases. What are the beneficial impacts of that? Well, again, I'll turn to my colleagues in the Fish and Wildlife Service, and they can describe to you what the impacts are. How we affect habitats. How that affects spawning areas. How that affects areas where the young of the year survive, and so on and so forth.

The other side of the coin, and something you've heard a bit about, is that we affect the flexibility of the Western Area Power Administration to generate power. What is this worth? What are we talking about here? What is this reduction in flexibility going to cost? Well, there are a couple of ways that we can look at it. We can first look at the value of that water used for hydropower, and how does it compare with other values of water. Take a look at agricultural water. What is water worth in agriculture? Well, in the Colorado basin it's probably worth somewhere between \$30 and \$50 an acre foot. In municipal applications, it's probably worth somewhere between \$200 and \$400 an acre foot.

Well, what about hydropower? Well, a couple of things we have to look at. It's a non-consumptive use. The value of an acre foot also depends upon the depth of the water behind a reservoir. An acre foot of water behind a reservoir 100 feet in height, or a dam, 100 feet in height and one 500 feet in height is not the same. But you can do some averaging. You can also take a look at an acre foot of water that is associated with a facility that's producing peaking power and one that's essentially a base-loading facility, and so on and so forth.

Well, some work has been actually done on this. Diana Gibbons with Resources for the Future has looked at this question, has looked at the Colorado in particular. The highest value is a short run marginal value associated with peaking power. And in the Colorado Basin, that acre foot of water is worth something like \$57. Now what do you compare? It's not just that acre foot of water generating power, but you have to take a look at the alternative. What is the alternative? A coal-fired power plant, a gas turbine in some instances, or conservation in some instances. But about \$57 an acre foot, not nearly as much as we pay for municipal water, a little bit more than we would pay for agricultural water.

Well, how else might we look at this from a systems point of view if we were actually running a system? The Environmental Defense Fund did look at a systems question in that regard. It took a look at Glen Canyon and the interim flow recommendations for Glen Canyon and what that power interference, if you will, would cost if Glen Canyon were operated differently. And I would just like to read a portion from the executive summary of this analysis. This analysis was done using an electric

generating model developed by the Environmental Defense Fund about twelve years ago and used now by EDF and used by a number of utilities in the west as well.

Three basic alternative flow release requirements in areas were examined. The first scenario requires minimum releases to be raised from the current 1000 cubic feet per second in winter and 3000 cubic feet per second in summer to 8000 cubic feet per second year round. In addition, releases would not be allowed to change by more than 5000 cubic feet per second in any one hour. Currently there are no restrictions on how fast releases may be increased or decreased. Power system costs are estimated to increase by \$3.9 million in 1991. That was the year for which the analysis was done. A second alternative additionally constrained the maximum release rate to 20,000 cubic feet per second for power generation purposes, compared to the current maximum of 31,500 cubic feet per second. In this case, power system costs are \$4.7 million higher in 1991 than the base case. The third alternative would require constant releases each month, that is there would be no fluctuating flows. This alternative results in power system costs of \$8.2 million in 1991 above the current operating costs. There were some modifications on these to allow for flexibility in certain instances where system capacity wasn't available elsewhere and then some of these costs can be reduced.

But let me just summarize here. These costs are a very small percentage, significantly less than 1% of overall power system costs, even when allocated entirely to the utilities which currently receive Glen Canyon power. Emission impacts are even smaller, and in some cases, positive, since the load shifting would go to coal-fired or to gas turbine facilities. The change in operations slightly increased sulphur dioxide emissions, while nitrogen oxide and carbon dioxide emissions were generally decreased. In other words, even making some rather substantial changes in this major power generating facility does not have enormous costs when you look at it from a systems perspective.

I would argue that if we did a similar analysis on Flaming Gorge and on the Aspinall Unit, Blue Mesa, we would find similar results. In fact, the Environmental Defense Fund, when there is a release of this biological opinion on Flaming Gorge, will look at just that question. What are the power interference costs associated with the change in operation, both the short term and the long term costs?

One of the concerns we have here in the Upper Basin is the way in which water escapes our grasp, that it goes from upper basin to lower basin - that the enemy is Arizona, that the enemy is California, just as for California the enemy is the Pacific Ocean. You know, the water gets out there and gets salty. Here, we're worried about it ending up in swimming pools in Tucson or in Beverly Hills or something like that. What do we do about that when we start changing the way in which we operate these facilities? What do we do about the concerns that Jim Lochhead expressed as Southern California continues to grow? Won't they get hold of Upper Basin Colorado River water and never let go?

I think we can take heart, quite frankly, from a remark that Mr. Miller made last night that if you look at what is going on in California, you'll see that that state is going to have to clean up its own act, that it's going to have to think about what it does with agriculture in the Central Valley vis-a-vis municipal demand in Southern California. Imported water from the Owens Valley, imported water from the Sacramento Delta, imported water from the Colorado River that runs through Southern California

pipes one time and then goes into the Pacific Ocean. That water is going to have to be re-used. A portion of it is now; a lot more is going to have to be re-used in the future.

Also, this great concern about Arizona. Arizona has its Central Arizona Project. Nobody wants to buy that water. That water someday, I believe, is going to come on the market in some fashion or other. Maybe it will be as a result of these discussions that are going on concerning the Colorado right now. I think that it makes sense, that it's good public policy to look seriously at the way in which we operate reservoirs in the Upper Basin both for the environment, and I would argue in the long run, for the economy of this part of the West as well.

Colorado River Operations: Questions and Answers

Ed Toner: Thank you, Dan. OK, we're going to open it up for questions. I'll open it up. I have a question for Reed. If the San Juan's habitat is recovered, what is the possibility of the squawfish population being recoverable?

Harris: First of all, we have a recovery team that's looking at the entire relationship of all these species in the Upper Basin. Right now, the Colorado Squawfish Recovery Plan is being revised and should be out shortly, but the plan calls for, correct me if I'm wrong here, John, recovery in three river systems: the Green River System, the Colorado River System, and the San Juan. The listing of the species then could take place independently in either the San Juan or in the Colorado or Green River Systems. I believe that's the way the latest revisions stand. It's not completely out yet. Biologists have recommended that all three river systems be recovered before the species could actually be delisted and taken off the endangered species list. I think the way that we view it right now, we're looking at each river system and trying to find out what the needs of that river system are, and trying to recover the best we can in that particular river system. The San Juan is somewhat isolated from the Green and Colorado River Systems, which, you know, allows us somewhat to treat them independently. But overall, we would like to save as many of those river systems as we can to insure the continued longevity of the fish.

Question: Dan, I have a question for you. I'd like to use the illustration of the little Dutch boy standing in front of the leaking dam and putting his finger in the holes that are leaking, and they just constantly leak out ahead of him. And I see the California problem in somewhat a similar light after what I saw last night with Mr. Miller's talk. That little graph seemed to show that about 30% of their water was flowing into the ocean unavailable for use, 29% was committed or dedicated to in-stream flows, wild and scenic, etc. That was a pretty shocking graph to me. Maybe California could solve their problems internally, but I think what I was seeing there was there is a tremendous pressure from the environmental side, everyone knows about the Mono Lake case, for Southern California to develop water supplies. So if we are to encourage California to do that and not put pressure on the Upper Basin, what is there in the future in the form of environmental opposition to internal diversions, let alone the political opposition in California to internal solutions to their problem?

Luecke: I think that for California to solve its problems, what you have to do is you have to take a look at the water already developed and how that water is used. The numbers that were up there, in both the graphs and the pie charts that Miller presented, show that about 80% of the water goes to irrigated agriculture and about 16%, I think, goes to municipal and industrial applications. It's a shift there from agriculture out in the Central Valley and the Imperial Valley that is important. If you were to do a comparable analysis on value of water in California, compared with the Colorado Basin, you'd find the same sort of distinctions, what it's worth in agriculture and what it's worth in municipal and industrial

applications. There's currently a bill before the Congress, what is called and was actually referred to by Mr. Miller last night, the Brady-Miller Bill, Senate 484, that is concerned exclusively with the Bureau Central Valley Project. And it has provisions that will allow water to move from agriculture to municipalities, it has provisions, contract renewal provisions, that would require reduction in agricultural use for a renewal contract. I think that it is legislation like that that the Upper Basin ought to look at and support to force California to solve its own problems. That's probably the best protection there is for the Upper Basin, aside from the fact that I believe the compact provides an enormous measure of protection for the Upper Basin.

Question: Is there any contract between WAPA and Colorado Ute, and what is being done?

Sabo: Well, I don't know how familiar everybody is with what's going on with Colorado Ute, but in essence, Colorado Ute Electric Association is a large generation-transmission cooperative in southwestern Colorado, and it recently, because of financial pressures, agreed with Public Service Company of Colorado among others, to break up. Colorado Ute received a major allocation of federal hydropower, a fairly significant amount relative to other allocations. At present, Western is caught in kind of a quandary because of the way Colorado Ute appears to be being broken up. There's some question as to whether those allocations would remain with the individual utilities, the cooperatives that are a part of that, or how it would be spread around. In essence, if Public Service Company of Colorado were to take it over, we'd be in a similar situation to what Utah Power and Light was seeking when they filed a law suit against us. In other words, they were seeking to get an allocation of federal hydropower on behalf of members that they have. At this point in time, the talks are on-going, and I would imagine they're probably going pretty furiously here for a while while we try to decide just exactly how that's going to be handled. But I think our real intent is to keep the federal hydropower allocation going to those member cooperatives in some form or fashion. I know it's certainly not our intent to retract it unless we absolutely have to, there's just no other way. But I'm sure that because of the amount, the magnitude and the cost, that we'll have a significant financial impact to southwestern Colorado if we have to retract that allocation. So, that's where we're at right now. The talks are on-going.

Question: (Inaudible)

Lochhead: First of all, let me clarify that this not a reopening of compact discussions. One of the major premises of Governor Romer's initiative is that Colorado does not seek to reopen compact discussions, and in fact the basis of the proposal is an affirmance of Colorado and the other states' entitlements under the law of the river.

Secondly, as to what is being done to keep the public involved, Governor Romer's letter was made quite public, and the Governor has issued a couple of statements to the legislature, keeping the legislature abreast of what's been transpiring. We've had one presentation to the legislature.

Additionally, the Governor has appointed three people coordinated by Ken Salazar, the Executive Director of the Department of Natural Resources, David Walker, the Director of the Water Conservation Board, Jeris Danielson, the State Engineer, and myself, to be Colorado's representatives in these discussions. And we have been going around the state speaking to as many groups as possible in terms of informing them of the situation on the river and Colorado's position. We have been actively soliciting and seeking input into that process. Additionally, Ken Salazar has formed a formal advisory group consisting of a number of water users' organizations, Native American tribes, environmental organizations, to advise the Colorado representatives as this process moves forward.

At this point, six of the states have, I think, expressed a willingness to discuss changes in system operations based on the Colorado initiative. Now we're awaiting a proposal from California. California has not really stepped up to the mark and indicated a willingness and a desire to implement a program to reduce its uses to 4.4 million acre feet. As I indicated in my talk, California's position today has been more of what I have termed a definitional solution to the river. They've in essence sought to perpetuate their over-deliveries through definitions of surplus conditions so as to allow additional water to come down the river. Colorado and the Upper Basin states have opposed that and really, I think it's up to California at this point to come forward with a proposal as to how they are going to undertake the program to essentially keep their water uses within their basic entitlement. We have made and are trying to make every attempt to make the Colorado process as public as possible and receive input from as many groups as possible. If anyone has suggestions, input, criticisms, support, whatever, those comments are welcome and are solicited.

Question: I'm Laura Davis from Fort Collins. I have a question for any of you that are interested. Just listening to this morning's discussion, it seems to me that the controversy is more between power development and fisheries than between water use for agricultural and municipal uses. But considering all of those requirements, obviously they had competing interests, it may seem like a simplistic question, but one device that I'm familiar with that's used in other contexts for floodwater protection in a municipal area, is to use on-stream detention, or off-stream detention to mitigate flows downstream. There may be multi-uses made of that detention area. It may be that it's dry part of the year and you can use it for recreational uses. Another situation in which you use on-stream or off-stream, I guess usually on-stream detention is where you have diversions for, say, placer mining, and you have fisheries downstream. And you can use settling type devices to affect temperature and sediment loading, and so on. Again, it may be too simplistic, but I haven't heard anybody mention it. Obviously economics is a consideration, but if the daily fluctuations are a significant problem for fisheries, could those problems be reconciled to some extent by using additional either on-stream or off-stream detention below the point of hydroelectric generation?

Gold: At Glen Canyon, one of the alternatives that was proposed to solve this problem is what's called a re-regulating dam, and that's exactly what you're referring to, although maybe on-stream detention

implies a lesser volume or smaller structure than some might envision, but certainly a facility downstream of a peaking power plant that would tend to smooth the flows that create a downstream impact, while allowing the upstream reservoir to fluctuate. One of the things that we've heard so far in spades is that if you think you've got problems now, try building another dam in the Grand Canyon. I think that's pretty typical of the kind of response, and I'd sort of be interested in Dan's reaction to that too, if we were to propose any kind of significant structures below most of the facilities of concern. The mention has been made that we've got some blue ribbon trout fisheries below most of these dams. Try to put a re-regulating structure in the middle of that. There's a lot of people who don't think that would be a very good idea. The one advantage that Aspinall Unit has is strangely enough, that's the way it was constructed. That's what Crystal does on the tail end of the system is tend to re-regulate, so that's one of the reasons that it's probably not in as much dilemma relative to impact from hydropower as some of the others. There are facilities that have been constructed throughout the West where there is an afterbay, a re-regulating structure. Those seem to work pretty well if they were implemented initially. But if we try to retro-fit, it seems, at least from my perspective, that we're obviously accused of wanting to engineer another solution, build another dam. It's not well liked by the vast majority of the people we're hearing from, at least, whether it's right or wrong.

Luecke: I don't know that I have much to add to that. Rick's right, and we certainly don't want to see more structures in the system, and I think if you were to do an economic analysis, it would be very easy to demonstrate that you could, by modifying the way in which you operate the existing facilities, affect the flow regime downstream for much less than what it would cost to put additional concrete in and do the consequent environmental damage associated with that.

Harris: We're looking at structural versus non-structural ways to save endangered fishes. Now part of the Recovery Implementation Program is to look at whether there is an engineering fix. I guess part of the problem with doing that and looking at the system the way we have now with the number of exotics in the system, we obviously don't want to put something out there that's going to create additional problems for us. I tend to think that most biologists would be opposed to structural ways of fixing the problem versus trying to find some natural way to solve the problems in the system. We're not opposed to finding any way we can to save the fish, but I think, you know, it's inherent in the Endangered Species Act, at least, to recognize that it's not just protecting the individuals, it's protection of the native habitats from which they evolved. Sometimes it's pretty hard for man, I think, to go and decide just exactly what these fish need and accommodate them with a structure. That's the part that I see being difficult.

Sabo: The only thing I would add is that I don't know if I agree completely with what Dan was saying, that the economics clearly demonstrate that it is not justified. But I think that before the idea of re-regulation structures are completely washed out, they do need to go through the rest of the NEPA process

that's on-going right now. I think it probably would benefit everybody to have that, the finality to that, rather than the people are, as Rick said earlier, let's jump to my alternative and forget about the rest of these. I think we need to go through an analysis all the way and look at all of these particular features and aspects before we start washing some out now.

Question: I thought I heard Dave say that changes in power generation at Glen Canyon would cost \$30 million. Dan said the top figure, I think, was 8.2 million. Do either of you know why you're so far apart?

Sabo: Well, I'll go first, if that's ok. I said as much as \$30 million. Our analysis and our assumptions were put out for the public record. What we're looking at is the purchase of firm capacity and energy as a replacement for the federal hydropower generated. I've seen the analysis that's been prepared by Environmental Defense Fund, but I don't know the assumptions that have gone into it, so I can't really speak to the differences between them. I know that our powerflow modeling is somewhat different than theirs. Theirs is more of a broad spectrum look at the West in general, and it's not so specific to the utilities that would be impacted. Dan?

Luecke: With respect to one of the fundamental differences, by changing the way you operate a system, you're not throwing out capacity. Your capacity is still there, all your turbines are still there. You're changing the way in which you generate power. You're changing the pattern of power. So, you don't have to then compare that, the alternative with changing the pattern, with going out and purchasing capacity, what you're doing, is you're going out and purchasing kilowatt hours as a substitute. And it's the difference in what you have to pay to generate those kilowatt hours on site and the cost, the operating cost of purchasing those kilowatt hours elsewhere. But you don't buy capacity because you're not losing capacity when you change the pattern of operations. That's one of the differences, I think, that exists between the way in which the Environmental Defense Fund did the analysis and the way that Western did the analysis.

Sabo: I guess I have a question then. It was my understanding from the power side that we don't lose energy. But the capacity, when we talk about capacity and energy, maybe if I could take just a second, capacity is the amount or capability of each unit to produce power. The amount of energy is generally what we're talking about in terms of kilowatt hours, the amount of energy that's evolved over a period of time, each hour it's measured the amount that was put out. Because of the limited amount of fuel, for the generators, or water, which is our fuel, we can use the generators either to attain their maximum capacity, that is go all the way up to hit a certain amount for a short period of time because we don't have the fuel to run it that way all the time, so we use it when we need it, and then we run it back down when there's not the demand. So I would disagree. We do need the capacity because if we're constrained from operations, we're not able to use the maximum output of those generators. We instead

would have the same amount of energy available, we'll just be able to put it out, a small amount over a long period of time. The purchase of capacity is extremely expensive here in the West. If we have to go and purchase a resource, a capacity resource, generally we're talking about increasing our cost by several orders of magnitude. I think Dan's right, that's probably the big distinction. If they're assuming that we don't have to purchase capacity, if we only have to purchase energy, which is relatively cheap, then there is going to be a big difference in our estimation of cost.

Gold: Let me add a little bit to that too. I think the idea of not reducing capacity needs to be framed in perspective of what happens with interim flows. Currently at Glen Canyon, use it as the example, we're allowed under the criteria to operate all the units of the plant up to about 31,500 cubic feet per second. And, at maximum head, that's where, if you do that, you can generate some 1300 megawatts of energy at Glen Canyon. If interim flows restrict that maximum, and I think the number that Dan used which has been on the table and has been analyzed, is something like 20,000 cubic feet per second, and you're never allowed to exceed that flow level, then you'll never be able to reach 1300 megawatts of capacity. So in essence you are limiting capacity depending upon the situation that surrounds interim flows, or any other flows, for that matter. If there are opportunities for you to use all of those generators during some short periods of time, then certainly the objective is to not force the purchase of capacity, but to rely on the ability to buy energy from some other source. So, I think that issue is out there and alive and well.

My understanding also is that Western's assessment of the cost, the \$30 million, comes from a financial analysis of what are we going to do next year? How much energy do we have to buy? What is our cash flow? What do we buy, what do we sell? How much extra money might it cost Western to operate during a given year under research flows? The EDF model is more based on an economic assessment of what are the alternate costs of producing the energy that can't be produced at Glen. So one, in my view, is rather an economic analysis of what is the economic cost value of that lost energy, the other is a financial assessment of what's in the bank and what's not in the bank. What's my cash flow situation? They are looking at the issue from two different perspectives.

Lochhead: I'm sure glad Rick clarified that. Let me add an additional concern in terms of water allocation and repayment. As I mentioned, the power generation system repays the cost that are embedded in the concrete at Glen Canyon and these other facilities. If the repayment of those facilities is put in jeopardy, then the United States is certainly walking away from a resource that is otherwise available and that's going to have to come from other areas in the United States Treasury.

The second concern is the extent that we narrow the band of operations, in particular Glen Canyon. There is a great deal of flexibility in the water allocation system, but at certain points, you start impacting the monthly and annual amounts of water that are run through the system for compact purposes. It's the position of the Upper Colorado River Commission and the Upper Basin states that those purposes remain primary, and there needs to be some flexibility in those operations in wet cycles

in particular to exceed those levels so as to allow those operations to continue and not adversely impact the ability of the Upper Basin states to make their compact deliveries.

Mitigation Banking

Charlie Jordan, Denver Water Department
Jack Dale, Trout Unlimited

David Baumgarten, Moderator

I'm David Baumgarten, the County Attorney for Gunnison County. I appreciate the opportunity to welcome you to Gunnison County and to moderate this session on Resource Mitigation Banking. When we meet as we do at the Colorado Water Workshop, we acknowledge both the very real consequences of water issues confronting us and the very serious efforts we're making to resolve those issues in a shared, disciplined, and face-to-face process. But more than that, we demonstrate the resolve and power of a professional community that is committed to learning together. It's a testimony to that commitment to learning that this morning I can present to you two guest speakers, Mr. Charlie Jordan of the Denver Water Department and Mr. Jack Dale of Trout Unlimited, to speak about Resource Mitigation Banking. I've asked each of our two guests to make a fifteen minute presentation. The presentation to be followed by a five minute rebuttal by each, and then the remainder of our hour for questions between our guests and from the audience. Our first guest is Mr. Charlie Jordan. Mr. Jordan is by education and experience a marine engineer, attorney, and land use planner. He's currently the Director of Public Affairs for the Denver Water Department. Charlie, working with others of varied and perhaps conflicting development and environmental interest, was instrumental in conceiving and outlining the concept of mitigation banking, which has been enacted as Colorado law on June 7, 1991, in Colorado Senate Bill 91-120. Although Charlie may have some reservations about the Senate bill as it was enacted, he is presented to you as an advocate of mitigation banking here in Colorado.

Jordan: I want to go through a little bit where we are with mitigation banking and share with you what is the bill that passed, at least what I think it is, and maybe what opportunities we have with it, where it might go, why I think there's some promise for mitigation banking, why Colorado should pursue this. If you haven't seen it already, everyone has a copy of the act in the red folder that you got at registration. It's in with all the materials on the left hand side inside the folder, and you might want to pull that out and look at it. I'm going to just go through the bill initially and highlight some aspects of it that I hope will sum up to an overall view of what mitigation banking is about. I want to present this as overlooking maybe some of my reservations in a positive light. Mr. Dale is here from Trout Unlimited to debate the issue today, and we're back to an adversarial system that we were told yesterday is obsolete. But, we'll try to work this out. It's very useful, actually, for Denver to debate environmental groups from time to time. Otherwise, we'd be left fighting with the suburbs.

In going through the bill, I'd like to bring your attention to one paragraph that almost everyone

skips in legislation and that's the Legislative Declaration. But I think it's worth looking at here. The General Assembly found specifically that the purpose of the article was to establish a structure to address compensatory mitigation. And I think that's important. Those words "compensatory mitigation" are very precise words in the federal system, and it means that when mitigation is appropriate, this is a vehicle, an optional way, to address it. If mitigation is not appropriate for some reason, then it falls outside of the purpose of this legislation.

On the next page, the General Assembly defines "resource". And it's defined very broadly. It says, "A natural resource which may be considered under governmental permit and/or recreation." So it's as broad as any permit requirement may need to be, and it can envision expansion in the future if the law is interpreted differently, if new resources are considered. This is broad enough to address those.

Basically, the General Assembly has indicated that the mitigation bank would be in the Department of Natural Resources directly under the director's office as part of what is now there as the Joint Review Process, which is basically a procedural place where state agencies are coordinated. There is a clerk and recorder for the bank that is created. Clerk and recorder. That's a term that you're used to hearing in county government, looking for in the Court House. The function of the Department of Natural Resources once the regulations are in place is largely as a recording body. A clerk and recorder keeps records. There are relatively few decisions for the Department to make in actually applying credits that may occur out at the bank. It specifically says, "Nothing herein shall be construed to prohibit the market transfers of banking credits." The attempt, and this really has not been done very much in other uses of mitigation banking around the country, the attempt is to allow this to be an entrepreneurial system. So that the marketplace can determine how valuable these credits might be, how valuable the mitigation work might be, and allow it to move to where the dollars are that will pay for it and use it to put it into place in the system. And I'm going to come back to that a little bit later on and explain it.

The Section 105 is one of the key provisions in the program. Basically, as you go through 105 what it says is that even though the bill passed, it hasn't been written yet. It adopts a framework for mitigation banking program and then delegates it all to the Department of Natural Resources to work out the rules. Well, that didn't just happen that way. In fact, the bill, as it started into the General Assembly this year, was a very specific bill, and it had very specific procedures laid out, left very little to the discretion of the Executive Director. But I think because it's a somewhat unique concept, and it's being approached here differently than it has in other parts of the country, I think the General Assembly was uncomfortable with trying to make the decision on specific procedures in the necessarily hurried format of committee hearings. They just simply had too much on their plate with a limited session to get into the kind of detail necessary to address the rules. So they assigned it all to the Director of the Department of Natural Resources, and then specified that he get a lot of help. And they told him to include a number of state agencies and members of the public, and to come up with management guidelines under the Administrative Procedures Act which includes requirements for public hearings. It basically says that all of us who are interested get to work out the details of this. They then provided for all of these to be brought back to the General Assembly again before the program goes into effect. So even though they

didn't want to work out the rules, they wanted to look at them and be sure they had a shot at it, before the program went into effect.

I want to talk about mitigation a minute because I think if you talk to people generally about it, it is largely misunderstood. The way it is being applied today and the way this act treats it, mitigation of a resource means improvement of that resource in almost all cases. It means you have to take the resource and enhance the value of that resource and the value that you get credit for is the difference between the two. So what you look for, generally, is a resource that can be improved, which very frequently is a resource that's been damaged in some way that has not been repaired in the past. And it may be from water being diverted out of stream that has caused wetlands to dry up in the past. It may be from wildlife that have been displaced or it may be from wildlife habitat that's been degraded in some way. You're looking for something that you have an ability to improve.

There is an exception to that in Section 106 Sub 2 that provides for preservation of a site, and this is, I say this is an exception, provided the Executive Director of the Department of Natural Resources determines that the resources of such site is of special value to the state. And there was talk about leaving that out entirely, but those that worked on the bill agreed that if you had a resource of special value to the state, it would be foolish to let that be destroyed in some way and not be included in the bill if there was a chance of protecting it and saving it. But it has to have special value to the state.

In going on through the bill, at the beginning of Section 107 is a key phrase that says, "Nothing herein is intended to authorize any person or agency other than the permitting authority to authorize or prohibit application of banking credits." It only applies to permitting systems that are already in place somewhere, already in place or created in the future. They have to be created by a bill separate from the mitigation banking bill, and nothing removes the authority from the permitting authority, whoever it might be, to make the decision of how this is applied. The primary permitting authorities are federal agencies. Not exclusively, but that's the process that most all of us find ourselves in from time to time. There are other permitting processes. There are local government permitting processes. And the bill is worded broadly enough to apply to those, and a lot of the questions during the session came from local government, and some of the language in here was placed there by local government to be sure that there was nothing in this bill that told a group of county commissioners, local decision-making authority, that they had to make a decision any differently than they wanted to make it under the authority that they have. So it doesn't change their authority in any way, it gives them another option to consider.

The role of the Department of Natural Resources is in keeping accounts on the bank. They record where the property was before it was improved. They record the scientific data necessary to determine what it was like then, what the values of it were then, and if it's requested by the permitting authority, go back out and determine to what extent it's been improved. The permitting authority doesn't have to request it. They could simply take the base data from the Department and go out and make their own inspection, depending on how they want to do it. The value that's certified to the federal agency when the Department of Natural Resource requested to make this inspection is the difference between the value that was there before someone started improving it and the value of where it is at the time that the

permit is actually to be issued.

There is a section then that talks about the rationale behind this being to allow some flexibility in where mitigation is performed. Not to require it to be performed on-site exactly where a resource damage may occur. There are some guidelines that are set up and the General Assembly recognized that the permitting agencies may want to establish their own guidelines, but suggested some here along the lines of basins or sub-basins of the state and there are 13 of them outlined in the bill.

Having gone through that, I need to add a couple of things that aren't so apparent in the bill. One is that there is no money appropriated to put all this into place. There is a person in the Department of Natural Resource who can perform the recording, but a lot of preliminary work needs to be done and there's no money there to do it. In the absence of contributions or grants or some independent funding source, there is no way for the Department of Natural Resources to move forward with this program right now. There's also a sunset provision in here which terminates the act in 1997. The legislature may or may not renew it, depending on what has happened between now and then.

I want to point out just a few things about it, and then I'll sit down and finish my portion. There really is nothing this broad anywhere else in the country. Mitigation banking has been used somewhat widely in this country and in Canada, but there's nothing quite this comprehensive that addresses as many potential resources and covers a whole state area like this mitigation bank does. However, there are other examples of mitigation banks out there in the country that are working. Some of them are not working so well, but there are lessons to be learned from looking at what's happening around the country. I think it's also important to understand that there's a lot of impetus for mitigation banking right now. It is mentioned in a number of federal documents, it's mentioned specifically in the Corps of Engineers-EPA memorandum of agreement that was executed a year and a half ago. It's present in three of the wetlands protection bills that are pending in the Congress right now, all of them encouraging it. Almost all of them doing it in such a way that it would be imposed by the federal government. This bill was an attempt to get in front of the federal government on it and have a state-run mitigation bank.

The final point I want to make is just a little piece of history. We didn't hear the term mitigation much until we got NEPA, the National Environmental Policy Act. When that was passed, and people began to do Environmental Impact Statements, they looked at mitigating the effects of resource losses or resource damages by improving resources in areas that are priorities for improvement. But as the federal agencies looked around the country, the federal agencies didn't have priorities established. And they looked at the states, and the states didn't have priorities established, so they fell back on the only thing they could fall back on. If we don't have priorities established, let's mitigate resources like kind, on-site, as closely as possible. And that was sort of a fall back position. The mitigation banking concept is designed to take us back to what made more sense logically and set some priorities. Where are the places that could best be improved when we're mitigating resource damages or resource losses?

In addressing that, you need to be aware that a number of cases where the on-site, in kind mitigation has not worked because the site itself or the geography of that area didn't really allow for it. It does not work very well to try to create wetlands where there were never wetlands before. We've had

a very bad track record on that. It does not make a lot of sense to try to improve a deer herd, an elk herd, in an area where we're already having problems with large game encroachments on other uses and conflicts with other uses. It makes better sense to do that in an area where those herds need to be expanded. Recreation is the same way. Just because recreation has lost at one place doesn't mean that you can put it back at that same place and have the same experience. So this was designed to address that.

Baumgarten: Jack is presented to you for his critique both of the concept of mitigation banking, and of Senate Bill 91-120.

Dale: I only have a couple of problems with the concept of mitigation banking. The first one is philosophical. The overall concept of mitigation banking I think is problematic, and then there's mechanical problems with the bill itself and how it might apply in Colorado. Philosophically, I see mitigation banking as a way to separate the problem from the solution. I think that with mitigation banking there's very little relationship left between cause and effect. Specifically, this act says that you don't require mitigation to occur at or even near the site of resource damage. Part of the problem with that is that resource damage is site-specific; therefore, the remedy has to be site-specific. The concept there is that if I'm hungry, I can mitigate my hunger by eating. If you try to mitigate my hunger by telling me that you ate last week, I don't think it's going to do me a lot of good.

I'm also concerned about the concept of not requiring avoidance, and not requiring minimizing damage as a pre-condition to credit applicability. Philosophically, separating the problem from the solution, and a remedy from the damage, just doesn't make any sense to me, and I think that if you look at the possibility that loss of a resource, or loss of a trout stream, or loss of something else is going to be mitigated by putting Port-a-Potties downstream or something similar, I think you'll see what I'm talking about. Mitigation is only a partial solution to a problem. Minimizing and avoidance are essential parts of that solution.

Another problem with the concept of mitigation banking is in this state, as broadly as it seems to be being applied, how are you going to value the resource? Who's going to do that valuation? And then, how is that credit going to be applied? If someone spends cash to create a mitigation credit, are they then vested with that credit? What happens if that credit is valued differently from someone else's credit? I think there has to be a resource inventory, and then a standardization of valuation in order to be able to make a system like this work. I think a study like that would be extremely expensive.

I'm also not sure how you would determine the market value of a resource and then factor in the non-market value as Rick Gold was talking about this morning. I have an overall problem with the concept of applying global averages to specific resource damage and specific instances. The concept of being able to average all the mitigation in the state and say that we have a net gain as opposed to a net loss has a certain amount of face validity, but you're dealing with site-specific damage, and I think you have to deal with site-specific remedy. The logic is the same as you would use if you tried to decide

which was better, a watch that was stopped, or a watch that lost a second a day. If you average it out, take a general average, then you'd say that the watch that was stopped was better because it's right twice a day. The watch that loses a second a day is only right once every 236 years. I think you'll see the problem with that. You look at a watch for a specific measurement, either what time it is now, or how long it's been since something, or how long it's going to be till something. What you're not looking for is an average. Mitigation is repaired damage. Resource damage is site-specific, and mitigation must be site-specific.

Baumgarten: Thanks. Questions that either one of you would like to ask the other? Charlie?

Jordan: Well, I guess in one context I would like to ask about the comment that avoidance and minimization is left out. Actually, I wouldn't mind avoidance and minimization being left out, but I don't think that there's any reason why it needs to be in the state bill. If you go back to the Legislative Declaration, it said the purpose of the bill is for compensatory mitigation. The federal rules right now, the memorandum between the Corps of Engineers and EPA say that the way that those federal agencies will approach permitting is that at first they will look for environmental impacts to be avoided, secondly to be minimized, and only then will they consider compensatory mitigation. Jack, do you think it's incumbent on the state to adopt federal regulations, and these aren't even written in the federal statutes, when the regulations are subject to change by federal agencies and might effect Colorado law?

Dale: Well, rather than answer that specific question, I'd like to go back to the overall idea of what you asked which is, should avoidance and minimization be a part of that? If you have an entity that is going to create a project that will cause environmental damage, and if that entity has a large number of credits in the bank already, what is the motivation to minimize the environmental damage that's going to occur? Is there any? I don't see it.

Jordan: I was asking the question first, Jack. But I'll answer it. I don't mind. The incentive for a developer today, of course, is to avoid permitting at all cost, if he can do it. The situation, the procedures today are not based on incentives for developers, the incentive is to avoid as much pain and cost as you can. I think that the real question is are the federal agencies going to be intimidated, somehow, because we've spent money in advance, into going ahead and issuing a permit the way the developer wants it issued? I don't have a very good track record with Denver Water Board of intimidating federal agencies, and I guess that's not a problem that I see.

Baumgarten: Charlie, a question that I have for you that might follow up on that. Given that the federal agencies have not been participants in the Senate Bill 91-120 process, what are the chances that the bill will successfully accomplish what it's goals are?

Jordan: Well, I think that's a very relevant question. For the mitigation bank to be workable, federal agencies have to be included. They have to be partners in the bank in some way. My own feeling is they would need to be tied in with some sort of written document, a memorandum of agreement in some way with the state. I think that has to come from the executive branch of the state. There was an attempt last fall to talk to federal agencies about this prospective program. The general answer that we received from the agencies was. "We're busy. We have a lot to do. We don't know that Colorado's really willing to do this. Is this just someone's idea, or are you serious about mitigation banking program?"

By passing the bill in such a way that the rules are yet to be written, I think the opportunity is there now for the states to say, "We are serious about the program. We need the federal agencies at the table. We've got to work out something that meets federal regulations." Frankly, it's an entrepreneurial system. I don't think anyone is going to be willing to make an investment in the environment, spend the dollars necessary to improve a resource on the chance that the federal government might say yes down the road. I think they need a little better assurance than that.

Let me add that based on the history of some other mitigation banks around the country, that even with an MOA with federal agencies, you still do not have iron-clad assurance that they will honor it. The track record has been that with other federal banks over a period of time, when something has been done in the banks, something added that the federal agencies disagreed with, they have not granted the credits in those cases. It's not automatic. There's a certain amount of business risk involved in making an investment in any case.

Baumgarten: Jack, a question that I had for you please. Since all the rules and regulations required by Senate Bill 91-120 are yet to be written, and in fact when they're written must be reviewed by the legislature, aren't the objections that you have premature?

Dale: I don't think so. The mechanical problems with mitigation banking are problems that grown-ups of good conscience and good faith can solve. And I have no doubt that through the process, the best mitigation banking bill that can be written would be written. The problem is I don't believe that mitigation banking is a good idea. I think that some of the underlying impetus for the bill is pretty positive, the idea of getting entrepreneurial money into natural resources. Getting private parties to improve the environment is not a bad idea on the face of it. But I'm concerned that one thing that will happen is that introduction of entrepreneurial endeavor into the program will end up creating a commodities market in public resources. I think the philosophical objections that I have to mitigation banking are fundamental. I think that no matter how well written a mitigation banking bill is, it's still going to be the best application of a bad idea.

Baumgarten: But Jack, given that Senate Bill 91-120 is now current law, how would you advise the environmental community to live with it?

Dale: Well, I think the only real hope the environmental community has with mitigation banking is that the overall difficulties in implementing it are going to extend past the sunset date.

Baumgarten: Questions from the audience, please.

Question: (Inaudible)

Dale: No, I'm not suggesting that you trash the project or trash the river rather. You're asking me to solve a problem, or at least address a problem, with which I am completely unfamiliar and with which your people are familiar. However, I would suggest that if the law required that the mitigation take place on-site, that you all, being very bright people, would figure out a way to do that. And I think that's proper.

Jordan: Let me say that the question illustrates something I think is worth bringing to everybody's attention. This bill, Senate Bill 91-120, is not a water bill. It is not a bill to address water development per se. It applies to anyone who needs a permit, and your example is a very good one where you're building a trail. Where mitigation banking has been used in the past, where I think it's most effective, most needed, is not for large projects, it's not the kind of things that make headlines for the Denver Water Board, although we are certainly involved in a lot of smaller things. It is the small project. In the course of discussions through the State Legislature, I was asked from time to time who is likely to make the most use of mitigation banking? And my first impulse was to say, probably counties in the road building business as they widen roads and improve bridges and work around areas in the wetlands. Certainly trail development is another area where you're dealing with such small amounts that the on-site, in kind mitigation rule just doesn't make sense for it. Even if you could put back twenty square feet of wetlands, who's going to go maintain it for you and keep it up? It just becomes something that you know is not going to work over time, and it makes sense to put it together in a banking proposal in a priority area where this can be done with other people. The bank's not there today. The bank won't be there unless Colorado can pass something and get some kind of initiative started so that people will put money into doing that kind of improvement and have it for you.

Question: Charlie, as you pointed out, this is a pretty ambitious undertaking. Seems like it puts a big burden on the Department of Natural Resources with very little additional resources to accomplish that. How big a problem do you see this being?

Jordan: The burden placed on the Department of Natural Resources was obviously something the General Assembly was worried about. They didn't have the dollars to put into it. In order to set resource priorities, you need to know something about the resource. You need some sort of inventory information. I don't think that this is a requirement to go map the state for every resource, and we've

done that for things in the past and found it to be extremely expensive. You don't have to, for example, have the precision mapping here that you would have for flood plain identification or natural hazard identification. But it is important to look at the resource and identify region by region maybe the top three to five priority areas that could be rehabilitated.

Now the extent of work needed varies by the resource. I think the Division of Wildlife in fairly short order could tell us where the priorities areas are for terrestrial wildlife and probably for fish species, without a whole lot of additional investigation. The Division of Parks and Outdoor Recreation has a plan that identifies priorities for recreation, region by region throughout the state, and the legislation specifically ties in to that plan. On the other hand with the wetlands, we're at a very low level of information. But there is an on-going, funded project, at work right now in the Department of Natural Resources, funded independently from this, that will start to amass that kind of information. I can't give you a dollar figure, but I recognize that that's a starting place and that's something that needs to be done before you can get into a program like this.

Question: Mr. Jordan, could you explain the amount set in the appropriation session on the last day to arrive at \$30,519? What was the basis for that later appropriation?

Jordan: I can't explain it, George, but I think there may be someone here that worked on that. I think that that was an appropriation that was assigned to the person who's already working in the Department of Natural Resource, and that was appropriation for that slot that already exists.

Jordan: I think all the appropriations work that way.

Question: (inaudible)

Dale: I agree with him. I think it's a fairly silly issue. On the other hand, as long as the regulations are drawn, you are going to have to deal with them. I think the solution there is to re-write the regulations. Twenty square feet, I'm not sure that a project would have to be drawn such that it would destroy that twenty square feet. I think with such minuscule area, maybe there's an alternative to that. But, again, unless I looked at the plan, I wouldn't know what it was.

Jordan: I certainly agree that dwelling on the twenty square feet would certainly be a big waste of our time and it's certainly been a waste of Longmont's already. I can see that there are ways of addressing that. There are nationwide permits for fairly small impact. It sounds to me like this should fall into one of them, but maybe it doesn't, since you've had this issue raised with you already. Let me put this in some perspective. I was kind of glad to hear Jack say that he's not too fond of using macrostatistics to prove a case because those are frequently thrown at us by environmental groups in some way that make it sound like there's a big problem, and we just happen to be an accidental casualty of it because we've

stumbled onto it, but the problem's bigger than our little piece. As you look at statistics of the losses of wetlands, for example, a lot of the losses that continue to occur today are occurring in small projects. The larger projects are expected to mitigate and expected to replace their losses, and usually do it by a fact of two or three to one, so they actually come out ahead. And yet we continue to lose wetlands. There's a portion of that that's unregulated activity, and a portion of it that's small projects in which sometimes people look the other way, or they mitigate it and can't maintain the small mitigation that they have. So there's a level of mitigation that can be addressed effectively in a mitigation bank. And most of the mitigation banks that have been set up nationwide are wetlands banks that have been set up for highways. Highways and road building, and it's because expansions of highways, new bridge building, affects relatively small parcels, and it doesn't make sense to try to go along putting in a whole bunch of small new wetlands. It makes sense to put them together into one that works better.

Question: I have two questions. One, what can you tell us about the current prospects or expectations on further implementation of this bill? Is there a time table for developing these guidelines or regulations? And secondly, I always find a new program abstractly like this somewhat hard to relate to. Can you, I guess this is for Mr. Jordan, perhaps give us any of Denver's thoughts on how you folks might intend to use this mitigation banking?

Jordan: I don't know the schedule. That question is really appropriate for our luncheon speaker today, Mr. Salazar, because he's the one that would start it and move it forward. I have not talked to him, I don't know what his plans are from this point on. But the initiative will come from the Department of Natural Resources.

As far as ways of using the bank, let me say there are a lot of scenarios that might work for this in the future. There was an attempt made in this bill, and this is really the thing that is unique to Colorado in addressing it, to make it entrepreneurial, to encourage some private money to go into the environment. And if the federal agencies were tied into this with a memorandum of agreement, I could envision people starting a business in environmental enhancement without any attempt to develop projects themselves in the future. Rather they would go out in the priority areas identified by the state and enhance the environment and maintain that enhancement so they have a marketable commodity that they could then sell to people who developed in that region so that they could actually make money out of it, in the same way that water rights have traded. This would be rights, or credits, in environmental enhancement. It seems to me that in a marketplace environment like that, the natural environment will always come out ahead, because unless the market is 100% efficient, and I don't think there's any market that works that way despite the Economics 101 textbook, there's always more money in the environment than you've taken out in credits.

The danger is, and I think this business risk would be built into the value of those credits, that you may not get credit for everything that you've done. That's the greater danger than that somebody would give you more credit than what you've done because you do the mitigation in advance, unlike the

current system, where you create the impact and then do the mitigation. With the mitigation bank, the mitigation is there at the time you get the permit. It's measured specifically in this bill from what you've improved at the time the permit is issued. So you don't have to worry. The resource agency, permitting agency, doesn't have to worry about, is this going to work? They can go look at it. The only question is, what does it take to maintain it? But they're way ahead, in the process.

Now, how Denver might use mitigation banking. I don't think that, if we had our Two Forks Proposal active today, we would need mitigation banking for Two Forks. You know that if we're going to go ahead with something that size, then we have the resources to do the mitigation work. And it's a large enough area that you have a lot of options for in kind on-site mitigation approaches. But what was suggested to us during the Two Forks process as an alternative approach by an environmental group, was what they called a "small projects alternative". Where instead of a large project, we do a series of small projects. Depending on how small some of those are, and I recognize that small to the Denver Water Board is not necessarily small in some cases, but depending on what size those turn out to be, we may have places where the amount of resource impacted is small enough that it doesn't make sense to try to put it back right there. And it would make sense to fit it in the mitigation bank. So that's how we might use it in the future if this were to pass.

Question: Charlie, you raised an issue there. Are you seriously suggesting that we create a commodities market in public resources with no standard evaluation and allow entrepreneurial government in that market?

Jordan: Well, when you say no standards for evaluation, I think that we're doing that today. We're making these valuations determinations. This allows the marketplace to turn them into dollars which is the way it works in a number of markets, including water today as a resource the value of which is being decided in the marketplace. But as far as what is actually credited on the permit, that's happening today. Anyone today who wants to go get a federal permit, whether it's for 20 square feet of wetlands or whether it's for something much larger than that, faces a dilemma in having a federal agency and state agencies offer their gratuitous advice on this, to determine how much is necessary to overcome that. And what they're doing today, by and large, they know they can't do with precision, so they put in error factors and we wind up with a requirement like we had on Two Forks, where Denver was required to replace three times the area of wetlands actually affected by the project. Well, the three to one is there because they're hoping a third of them survive. In this case, you would be able to look at it ahead of time and see what survives. Maybe a third survive, maybe a half survive, maybe a quarter survive. But you've got a real figure and you know that you're getting the resource replaced.

The Status of Colorado's Wetlands

David Cooper
Biologist

What I want to do in the next twenty minutes is give you an overview of some of the wetlands that we do have in Colorado, what some of the issues are with them, and perhaps my perspectives on what we should do about these kinds of things in the future. The reason that we're even talking about wetlands in an audience like this is probably for three reasons. One is that for the last 80 or 100 years there has been a lot of water development in Colorado that has dried up a lot of areas, changed the hydrologic regimes of many streams, and created wetlands in other parts of the landscape where they never existed before. A second reason is that the federal government has, under the Clean Water Act, taken jurisdiction over many activities in waters of the United States which include wetlands, and so the federal government is involved in regulating lots of activities that developers and agriculturalists and other people do. The third reason is that as wetlands were being lost through water development and as the federal program was being developed, we started to collect some pretty significant scientific data bases on the values of wetlands for cleaning water, providing wildlife habitat, and lots of other things like that. So, simultaneously, as we were losing these things, we were realizing how valuable they were, particularly in an area like Colorado where there are so few wetlands.

It has become quite an issue today. How do you know which wetlands to protect? The State of Colorado as you're going to hear later on from Peter Evans, is trying to develop a wetland protection or wetland conservation policy. How do you know how to protect them and which ones to protect? To do this we really need a very good scientific data base about what kinds of wetlands occur in a state like Colorado, how they function, and thirdly, what can you do to manage and use those wetlands for agriculture and other uses and still maintain some of their functions and values. That's kind of rough.

Another thing I want to touch on is the federal government's activities in regulating wetlands in Colorado. You have to understand, and maybe some of you already do, that the federal government only regulates wetlands, it does not protect wetlands. And it regulates certain kinds of activities which you're going to hear about later on from Ken Jacobson. Does the federal government really protect wetlands in Colorado? What kinds of wetlands does it protect, and what kinds does it not protect? What kinds of activities does it regulate, and which kinds of activities that affect wetlands does it not regulate?

Colorado's wetlands are really different from the kinds of wetlands that people have been concerned about nationally. The federal definition of wetlands describes, in sort of circuitous language, what a wetland is, and then it explains that the particular kinds of wetlands that are important are swamps and bogs and marshes. In the western United States, we don't have swamps, and we don't have bogs, and we really don't have the kinds of marshes that they're talking about. We really have very different kinds of wetlands systems here. And the federal approach has some real problems regulating the kinds of impacts that we have here on the kinds of wetlands that we have here as well.

Most of our systems are linear. They start at the top of the mountains where the snow is. They flow downstream. They're all connected together, and because we range from 14,000 feet down to 4,000 feet, there's lots of variety in the kinds of wetlands that occur and how they function. And our impacts on these different kinds of wetland systems, again, are very different. Now I want to talk about types of wetlands, especially those that we have in Colorado. Swamps are wetlands where there's generally some standing water at some part of the growing season. They're dominated by trees. They're forests. They occur along flood plains where there's abundant water, and there's really no issue in providing abundant water for these kinds of systems. Swamps have been drained, they've been dyked, but it's not like there isn't enough water in these areas to provide water for them. We don't have any swamps in the western United States.

Bogs are systems where there's again abundant precipitation, and these are peat systems where the peat builds up so that the peat is actually independent of the water table. They can be affected in minor ways by drainage. They have been in England and other areas, but they can't be affected by water diversion projects.

The kinds of peat lands that we have in Colorado are not bogs. They are something very different, and they are intimately connected to the water table. And they are very easily impacted, then, by water projects.

Marshes are dominated by herbaceous plants. There's usually some standing water. The coastal marshes affected by tides are very important in the United States for fish and wildlife production and other sorts of things. We don't have marshes quite like this in Colorado. We have marshes more closely related to the prairie potholes in North Dakota, small potholes connected to water tables. This means that the ground water system is very important for water fowl and other types of things.

In Colorado, at the head of Cross Creek in the Saguache Range, is an area where there's a little bit of controversy. This is a valley where snow accumulates in the upper part of the watershed. It flows down valley, and whenever there's a topographic low, some place that water can accumulate, slow down, saturate the soil, wetlands occur. And these wetlands in valley bottoms high in the mountains really control the movement of sediment and water through these valleys, and they're really very critical ecosystems in our mountain areas.

Now the issue is, how do trans-mountain basin water diversion projects that have headwater diversions affect these kinds of systems? We've been fighting over this for several years, as you might imagine. In Cross Creek, the controversy is whether these kinds of wetland systems are connected to streams. Can you divert the water out of a stream, in other words, and not affect the wetland? Or are these wetlands directly connected to the stream? Again, we don't have enough hydrologic data to really understand this. We do know that these wetlands are really valuable on a watershed basis. Most of them are pristine and in larger areas of the Rocky Mountains, but a lot of them are affected by ski area development. And some of these are independent of ground water from the slopes. They're integral with the stream.

Another aspect of our high mountain wetlands is kind of unique to a certain area of Colorado

called South Park. The west side of South Park is the Mosquito Range, which has limestone bedrock. This limestone bedrock creates very calcium carbonate rich waters. As these waters flow down, and as the ground waters flow down, it creates unusual kinds of wetlands which we think are unique in the Rocky Mountains, unique to South Park. One example is a wetland fed by ground water and this wetland, called High Creek, supports a lot of species which only occur in South Park. They're tied to this calcium-rich water. This wetland has been subject to some channelization down in the lower part. There's been peat mining in the upper part. There are many different threats to these kinds of high mountain systems. This example in particular has lots of species which are endemic to South Park. They only occur there, or they only occur there in South Park. So they are found only in South Park in the United States. There's a lot of biodiversity issues which are really key to address in South Park. We need to preserve these kinds of systems. They are unique in the United States.

Another thing about these high mountain systems is that many of the plants that occur there are more common in the Arctic and Subarctic throughout the world. We find little tiny populations of them in our high mountain wetlands in Colorado. For example, there is a species of sedge in Alaska which also occurs in the high mountains of Colorado. And in Colorado we find distribution of many plants that are common all over the Arctic but really don't occur elsewhere in the United States except for in our very high mountain wetlands in Colorado. These things are irreplaceable. They can't be mitigated once they're lost.

There's so much hype these days about ancient forests and protecting ancient forests. But ancient forest issues are dealing with trees that are two, three, four hundred years old. Well, here's a very different angle on it. Our wetlands are dominated by herbaceous plants like this sedge, and these sedges are basically underground organisms. Their rhizomes and roots live for a very long time. They're like aspen trees. Aspens are clonal, they spread vegetatively, the root system lives a very long time, and they don't reproduce sexually. You don't see new individuals or new populations starting. Sedges like this that dominate our high mountain wetlands are probably many, many, many thousands of years old. The individual plants are that old. We don't know how to start new populations of these things, so once they're destroyed, they really are not mitigatable.

Peat mining activities, draining and dredging, and diversion of water from these high mountain systems are things that we really don't know how to cope with. We've done some studies of peat mining in South Park. They've taken all the peat out, and the remaining material has been sitting like this for a long time, and it could sit like this for hundreds and hundreds and hundreds of years before anything happens. We really don't know what'll happen to say the least.

So what's the status of our high mountain wetlands? There are a lot of pristine areas, particularly in Rocky Mountain National Park and a few other areas, but lots of these systems have been affected by water projects and other projects as well. We really don't know what we have and what we've lost. We're still learning what plants, even, occur there, and what functions some of these have.

Probably the most important wetlands systems in Colorado are what are called riparian systems. These systems are the ones that the federal laws and the federal regulations address in the poorest

manner. The government doesn't regulate most impacts to riparian systems because the areas where these cottonwood trees are have a water table that's a little bit too deep to be considered jurisdictional wetlands according to the federal perspective. It's really unfortunate, because these kinds of riparian systems, particularly those dominated by woody plants, cottonwoods and willows, are some of the most important wildlife habitat in all of the United States, particularly for songbirds.

The Rio Grande River in the San Luis Valley is an example of a very dynamic riparian system. It moves around a lot. There's a lot of water and sediment moving in that valley, and I really need to emphasize the importance of both water and sediment. This morning, people were showing you hydrographs of the Green River in 1950 versus 1980. A hydrograph is just one part of the story. Remember, every stream also carries a sediment load, and if you restore the hydrologic regime of a stream without restoring sediment, I think you've done a tremendous disservice to a stream. I don't think those streams can really deal with all that water without the sediment. The sediment is important because many of the plant species that are important along these streams are really triggered to deal with the sediment. Let's take a look at cottonwood trees along the San Miguel River. Cottonwood trees produce catkins with seeds, and their seeds are dispersed very early in the summer, and the timing of seed dispersal is about the same time as our stream hydrographs are starting to drop. So as these streams are starting to decrease in flow, they're depositing sediment on the flood plain. These seeds are being dispersed, and these seeds have to land on wet, mineral soils, sands and silts, in order to germinate.

Along the San Miguel River where we still have some semblance of a natural hydrologic regime, we're still seeing recruitment of new cottonwoods into the populations. And here on the flood plain there are many new cottonwoods coming in. And the flood plain does have some realistic semblance of what lots of riparian areas in the western United States probably used to be. Lots of large trees, there's a different age of trees here and a different age there, and this is fairly healthy. Take away the flooding, take away the sediment movement and there's no recruitment of cottonwoods.

If you travel along the Colorado River, or any other river in the West, you can see that the cottonwoods are mostly old. Cottonwood trees only live a maximum of about a hundred years. And what is going to happen to our streams in the next fifty years as all our cottonwoods along all our rivers die is something that we really don't know.

It has been realized over the last fifteen or twenty years that the large trees falling into the river are the most important things structuring the habitat within streams. Trees lying across the channel create a pool above it, a waterfall there, and there's a riffle below it. If you take all the wood away from these stream sites, all you have is a riffle. It's the wood, the input of wood, that really structures these stream habitats, and so preserving the riparian systems adjacent to high mountain streams is really critical. The trees also provide a lot of shade, which keeps the water temperature cool and the dissolved oxygen high. The woody vegetation also anchors the stream banks. Another less noticeable role of riparian trees is all this leaf litter which they dump into the stream like organic rain late in the fall. That organic matter is what fuels the food chain in the stream. In other words, the large insects that live in the stream are eating the leaves. Without this leaf litter that enters the stream, there's no aquatic food chain. The whole

thing collapses.

What's the status of streams in Colorado today and the Riparian systems associated with them? It's very complex and mixed. A few streams still are in very good shape, but most of these are obviously modified. For example, let's look at the Poudre River out on the plains east of Fort Collins. There's no flooding. There's no recruitment of cottonwoods. There are no riparian zones. There's no shading. There's no organic input. There's nothing. This is not a riparian system anymore. It's extinct. It's gone.

Another example is the Blue River downstream of Dillon Reservoir. You can see this right from Highway 9. There's a beautiful stand of willows there. It's the nicest stand of willows on the whole river. Looks great, doesn't it? But the one thing you can see going on here is that there are lodgepole pine trees invading the willow stands. What does lodgepole pine tell you about the nature of this ecosystem? It tells you that the soils are no longer saturated and flooded and this ecosystem's really not functioning as a wetland anymore in some respects. It's drying out and in a period of time it will disappear as well because there's no more flooding.

Another impact is from cattle, who really are controlling the nature of a lot our streams in the West and a lot of our wetlands and a lot of our landscapes. In South Park, a stream like this looks healthy on one side of a fence, but if you go downstream a hundred yards, you find that the stream has been trampled, the riparian vegetation destroyed. Obviously, the functions and values of this downstream side for cleaning water, maintaining stream bank, trout habitat, and lots of other things, even recreation, are very different than this kind of situation.

Our ability to restore this kind of system is very limited. We don't really know how to do it. We've been experimenting with some livestock management. We've been experimenting with planting willows and other kinds of things, but for the most part we have only a limited knowledge of how to do it. And in a situation like this, if you were to restore the hydrologic regime, if this had been a stream that had had reduced flow in it, this stream could not handle increased flows at all. The healthy stream could. But the trampled stream, there's no way. You'd blow the whole thing out of the water. The vegetation really is a key element in maintaining the stability of these stream systems.

And what do these things look like all over Colorado? This is the Yampa River. No riparian vegetation along this. The White River. Same way. These are just sort of typical examples of the kinds of problems we face, all stream-related. How we can restore the hydrologic regime? How we can maintain the fisheries in these things? How we can increase the riparian values? These issues are very complicated.

I just want to discuss one more thing before I wrap up. This is the San Luis Valley that was mentioned at lunch time. The San Luis Valley wetlands are very different from the things we've been talking about. In high mountains, wetlands are connected to snow banks. They're linear for the most part. The riparian systems are linear as well. In contrast the San Luis Valley is a closed basin. The water table is very high throughout, and the sand dune formation has created depressions in which water can accumulate or in which we have standing water because of the high water table. This creates lots

of ponds and small lakes, and wetlands like you find in the Russell Lake area, a State Division of Wildlife sanctuary. These areas are very important for waterfowl. The wetlands of the San Luis valley are probably the most important waterfowl area in the southern Rocky Mountains for shore birds, ducks, sand hill cranes, other kinds of things.

It is essential to understand that you don't have to go very far above the water table to be in salt flats, to be in grease wood. And what this tells you is that all you have to do is change the water table a little. If you drop the water table a foot or two, basically you've lowered it below the level of these basins and there's really going to be some very severe wetland impacts. Water table preservation, then, is really important for protection of wetlands in areas like the San Luis Valley or South Park and other areas like that.

Obviously, by diverting water out of the river and spreading it on the fields to grow hay, we have created a lot of wetlands. For example, in South Park, lots and lots of wetlands were created by irrigation. We know that. Are these the same value as the riparian systems we've destroyed to create these? For wildlife, for water quality issues, there is no way. They're not comparable at all. Of course, as far as human values, there are some differences there.

In Colorado there are many different kinds of wetlands from the high mountains down to the plains. There are salt wetlands. There are fresh wetlands. There are peat systems. There are stream systems. There are all kinds of things, and they provide a lot of very important values, whether they're water quality values for removing nitrates and heavy metals from the water, whether they're recreation values, whether they're fishery and wildlife values. Lots of different kinds of values. How do you protect them? How do you protect those different kinds of values? I would just suggest that for every kind of wetland system, the way you would protect them would be very different, and the way you would approach a wetland protection policy, or plan, would be very different as well. For streams, just restoring a hydrologic regime is not the answer. You have to restore the sediment as well. The geomorphic situation of these streams is just as important as the hydrologic. Total flow of water, as well. The salvage of water from ground water tables like the San Luis Valley is something that will be tremendously important in the future. I think we're going to see ground water mining areas around Las Vegas. There's a big project proposed there, and these are going to be tremendously destructive projects, as well.

Wetland Definitions, Regulations, Implications

Ken Jacobson

U.S. Army Corps of Engineers, Grand Junction

Lucy asked me to come here and talk about definitions, regulations and implications: the what, and how, and why can't I, in terms of wetlands. We're still talking about the Clean Water Act, and we know that the purpose and intent is to restore and maintain the chemical, physical, and biological integrity of the nation's waters, including wetlands. And we know that we're moving more from a chemical date base. We're moving toward a biological type theory in terms of determining the biological health of our nation's waters. I agree very much with Dave in terms of the definition of wetlands and the illusion that since wetlands have to be bogs or swamps or marshes, we don't have any.

What is a wetland? In most people's minds, there's no problem calling a naturally inundated area a wetland. From a regulatory standpoint, it has an Interstate Commerce connection because there are waterfowl using it. Aside from that, it appears, in looking at all the various types of wetlands that are associated primarily with inundation, on a year-long basis, we have no problem as a public interpreting those as being wetlands. If you walk in to it, and you get wet, it must be. If it walks like a duck, so to speak. But, as you move further away from the pure inundated areas that are by everyone's definition wetlands, it becomes less and less perceptible by the public that we still have a wetland issue here.

You have at least three different wetland types. Dave would probably find six. But it's really difficult to provide the public with a definition that states that, in fact, these are wetlands. Let's look at an area which is a wetland by definition. It has a specific hydrology. It has hydric soils and it has wetland vegetation. However, someone is irrigating this area. The Corps chooses, and has dictated in a preamble to our regulations, not to regulate wetlands that are solely due to the application of irrigational water. Not to say that we won't regulate seeps, return flows, lower elevational areas associated with waste water on irrigation. Another real problem, and it's going to get worse if the manual proceeds in the way it seems to be going in terms of providing a wetland analysis, is that some of these larger mature riparian areas actually are wetlands. In the example shown in the slide, there are wetlands within the riparian corridor here, a smattering, that only make it because of the current hydrology criteria.

A wetland definition carried for years by the Corps and the EPA is:

Wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal conditions do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

I think the important thing about the definition is that it was just fine until they got to the last sentence. They should have left out the last portion of the sentence there where we get to the point that we start

· talking about "generally includes swamps, marshes, bogs, and similar areas." Much of the ado about the federal manual is being revised or may be revised right now as we sit here, was consternation between definitions of the agencies involved in performing wetland delineations in dealing generally with wetlands. As I said, this was the Corps and EPA's definition, and it persists.

The Soil Conservation Service may have had the best definition. They simply stated that wetlands are defined as areas that have a predominance of hydric soils that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support and under normal circumstances do support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions. Essentially, you take away the last line and a half there and it's the same definition and, I feel, probably a better definition.

Fish and Wildlife Service at the same time had a definition that read somewhat differently. Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface of the land, or is covered by shallow water. For purpose of this classification, wetlands must have one or more of the following three attributes. Those three attributes were: they had to support predominately hydrophytes, the substrata was predominately undrained, hydric soil, and it had to be saturated or covered by shallow water at some time during the growing season of each year.

If you look back into this original Corps definition, that's the one I'm most familiar with. It dictates the way in which the manual was constructed. You find the three parameter approach which initially came out of the old Corps of Engineers delineation manual back in 1987. It alludes to the three parameters in that definition. The prevalence of vegetation typically adapted to life and saturated, and then you continue with soils, pick them up, and so you essentially have covered all of the three parameters. And essentially what the manual is now is a three parameter approach, recognized, at least, in terms of guidance as the manual for regulating jurisdictional wetlands. That's a wetland. Wetland criteria that I just spoke about, hydric soils, the prevalence of hydric vegetation, and wetland hydrology are bound up into the old Corps manual, the '89 federal manual, and will continue into the revised manual no doubt. Hydric soils are defined as either saturated, ponded, frequently flooded, and support hydrophytic vegetation. I disagree with this last criteria, because based on my observations, by definition, sometimes it does support hydrophytic vegetation, sometimes it doesn't. You can have hydric soil characteristics without hydrophytic vegetation due largely to degradation of the area and loss of hydrology.

The Soil Conservation Service office provides the most immediate information available about an area's soils. Using soil maps, you can determine whether or not you're dealing on-site with a hydric soil. Unfortunately, not all of Colorado was surveyed. There may be an opportunity to get unpublished survey data from a local SCS office if they've been working on it. In the absence of that, you have to go to the field. There are various approaches to determine wetland soil types in the field. Most common is using the scale Munsell chart, which is a colorimetric method of determining whether or not you have a wetland soil. Basically, the lower you get in terms of hues and values, the darker the soil is, the more likely you have a hydric soil.

Another problem we have in this part of the country is that some of the heavy organic soils that

were created over time may be labelled hydric-based on the chart but aren't necessarily hydric in character. In this case, you can look at manganese nodules to see if there has been water influence on the soil itself. Mottling is a characteristic you frequently see. It's an indication that oxidation has occurred. The rust colored particles in the matrix of the soil are simply due to rusting.

The other criteria we're talking about here is the prevalence of hydrophytic vegetation. It's not easily learned science. You don't often have to identify the specific species, but nearly always you need to identify at least the genus in some of these areas. There's a myriad. I'd say that if you knew a hundred and fifty species by sight, at least in western Colorado, you could probably do a pretty good job of evaluating any wetland.

The third part of the wetlands definition is wetland hydrology. Either an area must be saturated within 18 inches of the surface, or inundated. One good technique you can utilize in the office, if you have aerial photography to cover some of the drainages, or you have access to it, is to try and proof through some of the lower elevation areas and drainages, and get an idea of what possibly might be wetland or not a wetland on sight. If you take that information to the field, and dig some holes, you make a determination as to whether you have the hydrology or not.

Another method is USGS stream gauge stations. They give a prediction of what flows can be expected and you can interpolate where the water table might be during the growing season.

Then of course there's the old scientific method of digging a hole. If there's definitely some hydrology within at least at 18 inches, no problem. Other things can give you a clue or tip you off, and you learn these things as you go through a regulatory program. There's a million subtle things out there that can give you an indication of whether it was wet or not. Often times, you can test the soil from near the surface and you'll get a glistening if you hold it into the sun. These are just common sense things to do in terms of trying to prove hydrology.

There are numerous wetland protection-related acts. I'm not certain that the Rivers and Harbors Act of 1899 which the Corps also administers, afforded much protection to wetlands except by coincidence. The Duck Stamp Act of 1934 definitely did in terms of providing and approving habitat, as did the Fish and Wildlife Coordination Act. NEPA, the National Environmental Policy Act of 1969, identified wetlands as areas that must be included in impact assessments, and the Corps in general has been involved as a cooperating agency and in performance of EIS's, as we all know. The Federal Water Pollution Act of 1972, revised to the Clean Water Act in 1977, vested responsibility to the Corps to administer Section 404 in cooperation with and alongside EPA. The Endangered Species Act of 1975 comes into play particularly for the Corps of Engineers in those areas that have projects located in the fifteen mile reach down near Grand Junction on the Colorado River. We coordinate a lot with Fish and Wildlife Service on endangered species. The Food Security Act of 1985, probably has the newest, biggest impact in terms of the agricultural community in Colorado. I won't say too much about it except that the Corps does interact with the SCS. We put on joint presentations. We are trying to define the differences and similarities in our programs and to help each other in the field in determining whether or not either agency might have a permit requirement in case of the Corps or whether it might affect

some kind of financial aid for the applicant in the future under Swampbuster.

I'm not too familiar with the Wetland Conservation Act. Executive Order 11-990 was essentially directed at federal land management agencies and requires them, to the extent possible, to provide all the wetland protection they can on lands to be administered, specifically Forest Service, and BLM lands. Now I'll get to the permit program.

Section 404 of the Clean Water Act, which is specific to the Corps, requires a Corps of Engineers permit prior to the discharge and dredge for fill in the waters of the United States. Our jurisdiction extends to all wetlands within the jurisdictional criteria and policy of the Corps, which excludes all irrigated wetlands. Obviously, during the development of the Clean Water Act, the agricultural community had a very strong lobby, and there are numerous exemptions available to the agricultural community that many people aren't aware of. There are exemptions for normal farming, silviculture and ranching practices. Now what does that mean? You can interpret that from one end of the scale to the other. In general, the Corps applies it to terms of normal cultivation, planting, harvesting, and crops. Construction of stock farm ponds is also in there, which I'm not sure that people are aware of.

Of course, obviously the exemption that affects most people is irrigated wetlands. We do not regulate the diversion of water in terms of irrigation, nor do we regulate the wetlands that are created directly as a result of irrigation.

There are a number of nationwide permits, twenty-seven on the books right now, that allow certain events to occur when they're minor in nature and have low level impacts associated with them. These have been authorized on a nationwide basis. The three that come to mind in terms of wetlands are work above headwaters, utility line crossings, and minor road crossings. Minor road crossing will allow you to cross wetlands a hundred feet on either side of an abutment for approach to a bridge crossing. Utility line crossing essentially will allow you to place utilities buried in wetlands provided the area is restored to its original contour and provided all excess material is disposed of and not on site. I want everyone to know that I don't agree with everything I say, I'm just telling you what it is. Probably the most damaging of the nationwide permits from an environmental standpoint authorizes work above headwaters, which is that point at which a stream is five CFS or less, or an isolated wetlands. And essentially it allows, without benefit of notification of the Corps of Engineers or EPA, an individual to fill up to one acre of those areas.

You might be interested to know that these nationwide permits are currently being revisited and revised. There is a total of 39 that are proposed now. One that's anticipated to change is the nationwide headwater one. It's rumored that it will go to one-half acre, and the limitation will only extend to five acres. Under the current dialogue, if you exceed one acre and it's less than ten, you have to go through a notification procedure with the Corps which coordinates the project with the EPA and Fish and Wildlife Service. The Corps and the EPA determine under what conditions you might be able to do the work between the one acre and ten acre limitation and at what level you would have to automatically invoke an individual permit and go through the public notice process. According to the proposed limits, one-half acre will trigger notification of the Corps and five acres will require an individual permit. So that is the

headwaters situation.

Ordinarily when we receive an application from an applicant, the Corps of Engineers determines the adequacy or completeness of that application. It may require an exchange with the applicant of information to get the application to a level where we feel we can adequately portray the project to the public in a public notice. At that time we issue a public notice. There is a thirty-day comment period. During that period, the courts perform their own analysis and take comments from individuals, special interest groups, local agencies, state agencies, and the federal agencies, specifically to include EPA and Fish and Wildlife Service, which we rely heavily upon for integration for the permits. At the state level that we are involved with, health departments, because they have to authorize 401 certification, or the Corps, without prejudice, can deny the application. We also deal with State Engineer's office in terms of conflict with the irrigation water rights and those issues. Once we've collected all this data, we massage it and we try to bring out any differences that we have. The only organizations we are really required to directly coordinate with by memorandum of agreement (MOA) are EPA and the Fish and Wildlife Service. We have informal and formal consultation measures where we try and resolve our issues and take a hard look at the project if we don't agree on issuance. If there's rationale with good reason, the Corps of Engineers will hold a public hearing. Hearings are not the rule, they are the exception. I've only had two in the last two years. All comments are included in an evaluation of the application.

There are three Corps districts that operate in the state of Colorado. Each has a really unique set of rules. Grand Junction has a field office out of the Sacramento District that handles western Colorado and all the drainages west of the Divide. Omaha has a field office in Littleton that handles the South Platte drainage, and the Albuquerque District has an office in Pueblo that handles the Arkansas/Rio Grande drainage.

How can you best approach a 404 permit process? Plan your project and, if there is a wetland issue, contact the Corps, see if they're available to make a determination. Or we'll provide you with a list of consultants who say they are qualified to perform delineations. Check the area. If it's an irrigated situation, make sure you really have a wetland that's regulated under Corps jurisdiction. Check with the Corps. See if it's either exempt, if it meets the nationwide general criteria, or a regional general permit, which I haven't spoken to because none of them really involve immediate wetland issues, they're all more or less stream permits. Or whether or not you might need an individual permit. Take advantage of your local expertise. The SCS has a lot of people who are more familiar with the field situation than Corps or EPA personnel, and they have a good understanding of what wetlands are. If you do that, maybe you can avoid this interagency meeting at a project site, which I call delineation by committee, which very seldom gets anywhere and strings the process out long because sometimes biologists in the field are like lawyers, you know, they all have their own opinion.

Wetlands Protection and Agriculture

Roger Mitchell

Vice President, Colorado Farm Bureau

When Lucy was trying to get a farmer to come up here and voice some of our problems on the wetland issue, the first requirement she stipulated was that we know the definition of a wetland. Well, she finally dropped that requirement and she got me to fill this position. I'm real honored that I got to do it. I went to several SCS offices around the San Luis Valley, trying to get the definition, and we still don't really know.

I'd like to borrow a phrase from President Roosevelt. December 23, 1985, a date that will live in infamy. On this date, the Food Security Act was signed with the provision entitled "Swampbuster". The Swampbuster provision of the Food Security Act of 1985 is aimed at discouraging the conversion of wetlands for agriculture purposes. With some exceptions, if you convert a wetland area to crop land, you lose eligibility for the USDA program benefits. Not just on the converted acreage, wetland area, but on the entire land that is owned by you, or farmed by you. Therefore, wetland classification is not only a legal issue for the agriculture community but an issue of continued uncertainty for the food producers of the United States.

A speaker will generally introduce a topic of information with a funny correlation or a joke or an analogy. Some farmers and ranchers that I talked to considered the wetland issue as a joke in itself. I'd like to therefore continue my talk and relate to you some of the following background as we understand it, as it pertains to the wetland classifications. Wetlands have a predominance of hydric soils. They are inundated or saturated by surface or ground water and under normal circumstances they support a prevalence of hydrophytic vegetation, typically your cattails, your willows, your water grasses. Probably most people here aren't from the ag community. Might be a few ranchers, farmers here, but I'll go back a few generations. When you went out to Grandfather's farm and you saw the cattails growing there, that could be construed as a wetland because that land supports this cattail.

"Farm wetland" is the next classification I'd like to touch on. These are certain wetlands that were manipulated and used to produce an agricultural commodity prior to December 23, 1985. They had not been completely converted prior to that date and therefore are not prior converted cropland. These areas still meet the wetland criteria and include potholes, or areas that seasonally pond or are flooded. I think some of the roads around the campus here might even qualify for wetlands. Prior converted cropland can either be a pothole or a ponded or flooded area that was completely drained and no longer meets wetland criteria or is saturated hydric soil that was manipulated or cleared of trees and stumps and used to produce an agricultural commodity, prior to the Food Security Act of 1985.

Converted wetland. This means a wetland that has been drained, dredged, filled, leveled, or otherwise manipulated that makes possible the production of an agriculture crop. You'll find a lot of the land that is being farmed today was put into production when the settlers first came over into Colorado.

They would see a swamp or something like that right out in their farm ground; they'd drain it and raise fantastic crops to feed the people.

Artificial wetland. This is an area that was formerly non-wetland, or prior converted wetland, but now exhibits wetland characteristics. In the San Luis Valley, for instance, someone earlier explained how we pump water out of a confined aquifer below the surface of the San Luis Valley. We can pump that thing down. I can remember years and years ago when we had a lot of pumps there. We were pumping and it was a dry year, and we lowered the water level 20 or 30 feet. During the last twenty years, we have about 90 to 100 miles of drainage ditch through the San Luis Valley that go east and west. They go about every mile and then they meet into a lateral and go into the Rio Grande River. What we're doing is putting our water rights into these drainage ditches, letting it seep into the underground aquifer, and building our underground water level up so that we're able to go ahead and pump through our sprinkler irrigation. Very few of the farmers in the valley now resort to flood irrigation. It's just about all sprinkler irrigation.

There are ponds that are being dug in corners of the fields to enable tail water to reach the underground aquifer. But those things grow cattails, they grow vegetation that should be on a wetland. We are very concerned about this. They come in and say, "You cannot clean that drain ditch or damage those cattails." It is useless as a recharge area. The winds blow down there in the valley and they will deposit dirt, sand, whatever, in those drain ditches, and after a couple of years, if we don't reclean them, they lose a considerable amount of their ability to recharge.

Why do I as a farmer/rancher need a wetland determination? I need it in order to remain eligible for USDA benefits, which can include one or more of the following: price and income supports, crop insurance, farmer's home administration loans, commodity credit corporation storage payments, farm storage facility loans, conservation reserve programs, and other programs under which USDA makes commodity-related payments. My eligibility is based upon a wetland determination, one that will decide if I can alter my wetlands or if I can maintain existing drainage systems or how I can farm without losing my USDA benefits

If you receive a determination that you disagree with, you should request a reconsideration with the appeals process. As of today, about 60% of the farm program participants have received notice of determination in the form of aerial photos. All the participants will receive notice before December 31, 1991. A participant will be notified of negative wetland determination by confirmation of SCS. And of course, there's a great amount of land owners who do not participate in any of these federal farm programs, and they will not receive wetland determination from SCS because they are not subject to the swampbuster regulation although they are still subject to the Clean Water Act regulations.

At a later time this year, farmers will be notified by mail that their wetland determination has been reviewed and certified. If a farmer thinks a mistake has been made, they may request a reconsideration by the SCS staff. Such requests will be accepted indefinitely, but any request filed within 45 days after certification may be appealed to state or federal levels.

There are lots of horror stories out there about certain things and I won't go into those, but I'll

just touch on a couple. There's a recorded case of a farmer from Pennsylvania that received clearance under Swampbuster to convert his pasture to vegetable production. For years he'd been a cattle rancher, and he'd been feeding his cattle on this grassland. Well, he finally saw the potato price was coming up, so he says, "I'm going to go to the SCS and see if I can plow that and plant some vegetables." So, the SCS says, "You've got our blessing. Go for it." So they went in there and got ready to go and all of a sudden he was forbidden to do so under Section 404 of the Clean Water Act. But since January of 1989, the SCS, the Corps of Engineers, the EPA, and the U.S. Fish and Wildlife Service have agreed to use the same wetland guidelines. Due to the numerous land owner complaints, however, the guideline manual is now in revision. Even with revisions, I feel the regulations would need to be interpreted by a court of law.

Another way of addressing the issue of land owner complaint relating to determination, is through present use. Permits may be needed to drain or alter farmlands. Both state and federal permits may be required to do so. Ken covered this pretty extensively a while ago. An exception subject to the Swampbuster provision may occur if you began the conversion of wetlands before December 23, 1985, or if the wetlands were created artificially through irrigation. The federal Clean Water Act also requires permits from the U.S. Army Corps of Engineers for the discharge of dredged or fill materials into all natural waterways, rivers, lakes, ponds, and wetlands. If you drain a wetland without a permit, you risk being in violation of state and federal laws, with resultant penalties.

What is the history behind the 1985 Farm Bill as it relates to this wetland issue? What was the reasoning? The writers of the regulation have adopted many views that they felt reflect these necessary guidelines and definition. It's only fair, I think, that we take a look at the reasoning. The bureaucrats state that half of the 200 million acres of original wetlands have been destroyed. Historically, Americans have viewed wetlands as useless swamps. In response to this loss, the National Wetland Policy Forum set two goals for protecting and managing the nation's wetlands. First to achieve zero overall net losses of the nation's remaining wetlands, and two, to increase the quality and quantity of the nation's wetland resource base.

One of the other reasons people want to protect these wetlands is for flood control. Everyone will admit that they feel the wetlands help control floodwaters by absorbing water during heavy rainfall and slowly releasing it on downstream. Another purpose is erosion control. Wetlands are often located between bodies of water and buffer the shorelines against erosion. Another reason to protect wetlands is fish and wildlife. Most fish and shellfish that we eat live in wetlands when they are young. Many wildlife migrate through wetlands, as do many endangered species. Nearly all the fish and shellfish harvested commercially, and half the recreational catch, depend on wetlands for food. Boating and hunting, that's self explanatory. People like wetland areas for canoeing and other types of recreation. Migrating birds depend on wetlands. Water quality is a big issue that's facing us in Colorado. They contend that the wetlands act like a giant kidney. They help purify water by processing nutrients and suspended material and other pollutants.

The reasoning behind the wetland regulations are deep points that should be considered, and I for

one would be the first to agree with each wetland benefit. However, agricultural related fields are forced to rely on more than benefits. Farmers and ranchers face ever-changing regulations, conditions, and policies that are often adopted and forced without taking their knowledge, experience, and livelihood into consideration.

Four federal agencies, the EPA, Army Corps of Engineers, SCS, and U.S. Fish and Wildlife Service, adopted the wetlands delineation manual in January of 1989. This was done without notice or opportunity for public input or Congressional oversight. This new manual brought 60 million acres of cropland under regulation as waters of the U.S. by expanding the definition of wetland. There now exists a federal definition of wetland that includes a great deal of land that no one would ever recognize or consider to be a wetland.

This expanded definition is having an adverse effect on farmland values and overall economic growth. A little example of this is a lot of the farmers buy a lot of equipment so they can handle so many quarters of land. A tractor nowadays will run you close to \$100,000. A harvester, \$40,000. You get into so much money that it's staggering. The only way a farmer can exist is he's got enough quarters of land to make this pay. All of a sudden, this wetland determination has come forth and he can't farm that one quarter anymore. It is taken right out of his production and it's devastating to him.

Here is another example of how wetland determination can hurt a farmer. I have a neighbor who's probably about 70 years old now. All his life he's never really saved any money. He's put his money back into the land. His land is probably worth three-quarters of a million dollars right now, but if they come in with this wetland determination, this land will not be able to be farmed, so he will not be able to sell it or live the remainder of his days on this money. He'll be broke. Because I know I wouldn't want to buy that corner of land that I can't farm. So these are just some of the problems that we're facing out there in agriculture.

The U.S. House Small Business Committee Chairman, John J. LaFarz, a Democrat from New York, has called for the four organizations involved to initiate a moratorium on the use of the 1989 delineation manual. Under the Clean Water Act which governs the use of wetlands, a property owner may be denied the permit to develop, build on, or farm a piece of land that has been classified as a wetland. However, the Fifth Amendment of the Constitution of the United States states that private property cannot be taken for public use without compensation.

We all know that Congress passes bills, the President signs the bills into law, and the bureaucracy writes the regulations which ultimately have the greatest impact on the individual farmer and rancher. The agencies writing the wetlands regulations must be having a heyday, because too many of us who are producing food and fiber to feed Americans and others around the world are having a miserable time trying to figure out the rules. Can any of you people out here who are not farmers or ranchers imagine what it would be like to start farming or ranching when you first have to read and understand all the rules before you can start? I think we'd all die of starvation. You can't go to the bank and borrow money for your equipment without first knowing what the final outcome is going to be on the wetland determination on your land. This is awfully difficult.

Again, the four federal agencies are writing rules on wetlands. One agency is issuing 404 permits to landowners who request it so they can protect their property from floods, or for cropping or livestock watering. Sometimes the permit isn't issued until the flood has already hit. The next agency can veto the permit because of water quality impacts or threats to wildlife. Another agency wants to inventory all wetlands from a simple mud puddle on up. Another agency is taking aerial pictures of anything that looks like a mud puddle and shows up as a dark spot on a photo that may only be a pile of rocks. The farmer and rancher has to deal with all these agencies or be fined or jailed or be refused benefits from the farm program or whatever. The farmers can live without some of the subsidies, but they sure don't want to go to jail. They'll let the country probably starve before they do that. How can anyone know what to do to comply?

Let me dig a little deeper into the wetlands story, how it's a problem for agriculture, and then I'll tell you what we're trying to do to solve some of the problems so that the government will not rule us out of business. Colorado has a semi-arid climate with a very diverse agriculture. Wetland areas in the mountains can be very different from wetland areas in the San Luis Valley, eastern plains, or along the river valleys. I am told that in the Mississippi delta area, natural forces erode fifty to sixty thousands acres of wetland annually. In my mind this says that no net loss to wetlands is impossible to achieve. It is very difficult to have the no net loss policy site-by-site or state-by-state. A coherent and rational wetland policy must be flexible enough to adapt to state and local variations and must also balance the competing economic and social forces.

What research or data collection is necessary in working toward a goal of no net loss? I strongly object to the continued use of the often cited figures from a 1983 U.S. Fish & Wildlife report which estimates ag conversion of wetland at half a million acres per year, and to the 1984 Office of Technology assessment report which estimates conversions taking place at 275,000 acres per year. These estimates were derived from data collected 15 to 35 years ago, and do not reflect current economic trends and the effects of the Swampbuster provision of the 1985 Food Security Act. EPA studies show that in counties where Swampbuster regulations have had effect, wetlands conversion has virtually ceased. U.S.D.A. reported in 1990 that wetlands losses on private land slowed significantly during the 1980's. Their study did not reflect increases in wetlands as a result of the Conservation Reserve Program. Nor did it reflect wetland created by irrigation methods.

The public should not be misled by extreme environmentalists who would try to make it sound as if wetlands are being destroyed everywhere. I'm not saying anything against environmentalists because farmers are some of the greatest environmentalists as far as I'm concerned. A wise old man once said that the two times that you're closest to God are when you're having a baby or arranging something from the farm. I'll leave the first one to the women, but the environmentalists, we take care of our ground out there like any of the environmentalists around the country, probably even more so.

We have taken some action to support HR-1330 by Representatives Hayes from Louisiana and Tom Ridge from Pennsylvania and a soon-to-be-introduced Senate version by Breaux from Louisiana. This bill makes the following changes in Section 404. One is a realistic wetland definition. The current

criteria used to define wetlands is too broad and results in regulations on large amounts of land that, from a practical standpoint, do not have any wetland value or functions. HR-1330 defines wetlands in a manner that protects true wetland areas. The Hays-Ridge Bill requires the presence of all three indicators: water, soil, and vegetation. Before a delineation can be made, the surface must be saturated for 21 consecutive days during the growing season in years of normal rainfall.

The second thing in this bill is the exclusion of prior converted crop land. All prior converted ag land would be exempt from regulation of the Clean Water Act 404 Program. These lands no longer exhibit any wetland characteristics and should not be regulated as such.

Thirdly, this bill clarifies normal farming practices. Current law provides an exemption from individual permit requirements for normal farming and ranching activities on farmed wetlands. This bill clarifies and reinforces this important exemption.

The bill also provides a system of wetland classifications. Wetland legislation should recognize that all wetlands do not share the same values and functions. HR-1330 would result in the classification of wetlands by evaluative function.

Compensation. The regulation of wetlands has emerged as a federal land use policy that limits, restricts, and prohibits economic activity on much privately owned land. HR-1330 requires compensation be provided to land owners for the loss of economic use on private lands. We need to exclude man-made or artificial wetlands such as the ponds and the irrigation ditches that I was mentioning before. They are not naturally occurring waters of the United States.

We have talked to state congressional delegations across the country to request their support and co-sponsorship. Agriculture is not alone. Some of you may have read in the papers about the property owner in Arvada who has been refused a permit by the city to build homes on his property that has wetlands on it. Environmentalists are using their threats to stop the homes from being built. In another example, Jack Kemp, the U.S. Secretary of Housing and Urban Development, reported in the Wall Street Journal recently about the case of a critically needed homeless shelter built up in Juneau, Alaska. These people drastically needed this housing, but the town said that they had to have a parking lot. So they got a quarter of an acre adjacent to it and were turning this into a parking lot. This land was construed as a wetland and the Army Corps of Engineers stopped the development of this parking lot, so therefore it stopped the building of this housing development. So, the homeless families went someplace without decent housing, and the patch of wetlands is safe and sound.

The state has decided to get into the wetlands act too. As some of you know, Gov. Romer has just signed legislation by Senator Don Ament and Representative Dan Williams for a wetland mitigation bank in Colorado. I talked to John about this a few minutes ago. At first we were very skeptical of having another level of bureaucracy, of government getting involved in a wetland program, especially since the federal government has already created so many problems for agriculture. As I understand the new law, it is an attempt to create a system that would help continue the development of our water and land resources while at the same time preserving true wetlands. We said that any program like this must be voluntary for everyone who participates. John was telling me that it is voluntary. Just as long as it

stays that way, we will probably go along with it.

Let me give you an example of how this new law may actually help agriculture. Farmers and ranchers typically view a wetland as a nuisance with no economic value. If a farmer or rancher has a true wetland on his or her property, which has not been used for agriculture purposes, he or she could deposit that wetland into the mitigation bank as a mitigation credit. That wetland would continue as a wetland but with a higher environmental and economic value than previously held. The value is created when someone else needs to develop or utilize a wetland somewhere else in the country, and he could purchase the mitigation credit from the farmer or rancher who holds this wetland. The farmer or rancher could then sell the credit to that person for the negotiated price. It makes economic and environmental sense to me as long as it's totally voluntary and the state does not try to inventory and regulate means to save these wetlands. It's worth a try, but we all know that Congress will ultimately have to solve the problem.

I think this problem of saving wetlands can be solved and not with unrealistic regulations from bureaucrats who don't understand what it means to own private property and deal with the elements of nature. Everyone here knows what private property is. If you're not into farming, you have a lawn, you have a house. That's your private property. No one should come take that away from you. Farmers and ranchers are not destroying wetlands. Of course, there are isolated instances where something may occur, but we must remember that wetlands are part of an individual private property, and private properties must be protected under the U.S. Constitution. Let's not legislate our rights away from us. Let's keep food costs down as I've explained earlier. Without the ability to raise plentiful food like we're getting now, the cost is going to rise higher and higher, and the one that's going to pay the price for the food is the consumer out there.

Let me end in quoting from a recent editorial in the Rocky Mountain News entitled "Into the Wetland Swamp", which I think is quite relevant to this wetland issue. "Over the last sixty years, Americans have ceded enormous power to the federal government, often with the best of intentions but little forethought. Government must therefore exercise its power with discretion by writing more restrictive wetland definitions and thus limiting their own power. Federal bureaucrats can show that they have not entirely forgotten about the sanctity of private property or the benefits of economic growth."

Wetlands Regulations and Agriculture

Steve Chick

Colorado Soil Conservation Service

Beginning with the 1985 Food Security Act (FSA), SCS was charged with determining if a specific area is wetland or converted wetland and whether certain wetland exemptions apply. Under the FSA, a person is ineligible for USDA Program benefits if wetlands are converted after 31 December 1985, for the production of an agricultural commodity.

Wetlands are defined as areas that have a predominance of hydric soils and that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions.

SCS completed an inventory of potential wetlands on all cropland and potential cropland adjacent to cropland. Wetland inventories were prepared by trained photo interpretation teams using current available aerial photography, soil surveys, U.S. Fish and Wildlife Service National Wetland Inventory maps and other data. Determinations will be done at the local Field Office by the District Conservationist, using the inventory and on site information. Producers are to be notified of the wetland determination on the land they operate. The wetland classifications used in FSA wetland determinations include the following:

Prior converted cropland (PC). A prior conversion is a wetland alteration that was completed prior to December 23, 1985. Such areas, unless abandoned, will be labeled prior converted cropland (PC) and are not subject to FSA wetland rules.

Artificial wetlands (AW). An area is an artificial wetland if the area was formerly nonwetland or prior converted cropland, but now exhibits wetland characteristics because of human activities.

Irrigation-induced wetlands (IW). A wetland area is an irrigation-induced wetland if it was created by irrigation or seepage from an irrigation delivery system; but was nonwetland in its natural state.

Wetlands (W). The production of an agricultural commodity is possible on wetland as a result of a natural condition, such as a drought. This means that a wetland can be cultivated or farmed under natural conditions, but cannot be altered or manipulated such that wetland characteristics no longer exist.

Minimal effect (MW). The production of an agricultural commodity on a converted wetland, in connection with all other similar actions in the area, would have minimal effect on the hydrological and biological functions of the wetland.

Farmed wetlands (FW). Wetlands that were manipulated and used to produce an agricultural commodity prior to December 23, 1985, but had not been converted prior to that date, and therefore are not prior converted croplands. These areas include potholes and playas that still meet the wetland criteria, or areas that are seasonally ponded or flooded for an extended period of time. Alterations made

on FWs prior to 23 December 1985 may be maintained. For example, irrigation and drainage ditches installed prior to 23 December 1985 are allowed to be cleaned out and structures may be maintained. Further alterations, however, are not allowed.

These wetland classifications apply only to FSA rules. Other Federal, State, and Local rules may also apply. For example, a 404 permit from the Corps of Engineers and EPA may be required. Contact these agencies for their rules.

Producers who converted wetlands to non-wetlands between December 23, 1985, and November 28, 1990, are/were in violation of FSA when they planted an agricultural commodity on the converted wetland (Swampbuster). The 1990 Food Agriculture Conservation and Trade Act (FACTA or the 1990 Farm Bill) changed the Swampbuster trigger. A producer is now in violation of FACTA if wetland is converted after November 28, 1990, making the production of an agricultural commodity, pasture or forage crop possible.

Producers who are in violation of FSA are ineligible for commodity program benefits, FmHA loans, and storage loans and payments. FACTA expands the ineligible list to include Agricultural Conservation Program (ACP), Emergency Conservation Program (ECP), Conservation Reserve Program (CRP), Agricultural Water Quality Protection Program, Environmental Easement Program, and the Small Watershed Program (PL-566).

Appeal procedures provide a mechanism for reviewing disapprovals of wetland determinations made by SCS. The purpose of an appeal is to determine if technical decisions were correctly made and if the rule was properly interpreted and applied in a specific situation.

Wetlands Protection and Water Development: The Muddy Creek Project

Eric Kuhn

Assistant Secretary/Engineer

Colorado River Water Conservation District

What I want to do is go through a little history of a relatively minor water project, as water projects go, and kind of go through what we went through over the six years of our history of dealing with wetlands on it. It's not quite over yet. If we weren't having this wetlands discussion, as I understand, Ken would be back there working on a record of decision. But anyway, we're pretty close to resolving the issues on Muddy Creek.

Back in the early 1980's, a number of West Slope entities, including the Colorado River Water Conservation District, or the River District, signed a memorandum of agreement with the Northern Colorado Water Conservancy District Municipal Sub-District. The Municipal Sub-District at that time was trying to obtain court approvals or permits for the construction of the Windy Gap Transmountain Diversion. A part of a very comprehensive settlement on that was the anticipated construction of a compensatory or mitigation reservoir on the West Slope. It was originally intended to be Azure.

Azure is located on the main stem of the Colorado just to the west of the town of Kremmling. Azure is from a geotechnical standpoint a wonderful reservoir site. However, it has one problem, one minor problem, and that's that there's a railroad running through it. Now if those people who think they've got problems with the Corps or the EPA or some of these other federal agencies, believe me, those agencies are just pussycats compared to railroads, especially land grant railroads. If you move the railroad, you only do it at your cost and you only do it in a way that they'll agree to. So as a general rule, a reservoir site is not a reservoir site if it has a railroad running through it. Anyway, we quickly found out for various reasons that Azure was not the site we thought it would be.

The parties to the agreement, including Grand County and others, met with the Municipal Sub-District. We amended our original agreement, and in the process, we agreed to look at alternative reservoir sites. I would call them off the main stem. They are actually on creeks. One of the reservoir sites was going to be on Rock Creek and one of them on Muddy Creek. The Muddy Creek is just north of Kremmling, the Rock Creek site is just west of Kremmling. Basically, one is to the east and one is to the west of the Azure site. They're all within about 30 miles of each other.

Now, when we originally decided to look at alternatives, we went to see the Division of Wildlife in Grand Junction. We basically explained what we were doing, and their initial advice was go to Rock Creek. In fact, the Division of Wildlife has 640 acres of land in the Rock Creek Basin, and the reason they bought that was to build a reservoir. So if the DOW can build a reservoir there, they figured that's got to be a great place for us to build a reservoir. Not only that, at that time they were very concerned about the Muddy Creek site because of big game, deer and elk.

In 1985, the District applied to the Forest Service for a federal permit in effect to trigger the NEPA process. However, we knew from our previous discussions with Grand County that the Grand County folks were very concerned about having a reservoir close to them. The Muddy Creek site was closer than the Rock Creek site. We basically made a commitment to Middle Park, Grand County, and others, to give both the sites on Rock Creek and a site on Muddy Creek equal consideration. And the permit application to the Forest Service triggered that process.

Now I'm told this is one of the few times in the 20-some year history of NEPA that we actually used NEPA to decide which project was better. But nonetheless, the original advice of the Division of Wildlife did not turn out to be the best advice. If you look at wetlands and other issues, it becomes very clear that from an environmental standpoint, the site on Muddy Creek was much better. We presently call that the Wolford Mountain Project, so I might slip and call it Wolford Mountain, but I'm basically referring to reservoir sites on either creek.

Now if you look at the two sites as far as their topography and their use, the site on Rock Creek was on Forest Service land, a big part of it was owned by the Division of Wildlife. There was some grazing on it, very little. There was some big game use in the summer. There again, very little. There was some fishery use. It was supposed to be a secret among certain people as to how good the fishery really was, but nonetheless, it was what I would call a pristine site.

On the other hand, the site at Muddy Creek had been farmed and ranched for about 100 years. So the wetlands there had been grazed, they had been inundated, there had been additional wetlands that had been created through irrigation. Effectively, this was a site that had been very much impacted by man. On the other hand, the Rock Creek site was something that had been visited by a few people and that was about it.

In 1987, we issued a draft of our environmental impact statement and asked for public comments on the two projects. The federal agencies reviewed those comments, and in 1988 they issued a draft supplement environmental impact statement identifying the site on Muddy Creek, or Wolford Mountain, as the preferred alternative. And one of the major reasons, if not the major reason for that preferred alternative decision was the high value of the wetlands in the Rock Creek Basin when you compare them with the Muddy Creek Basin.

Now when I say the high value, that does not necessarily mean in terms of quantity. Depending on how you define wetlands, there may have actually been more wetlands in the Muddy Creek Basin than there were in Rock Creek. So we then ran into a big problem, and that's what we really want to talk about. And that is, how do you define a wetland?

The Corps, Ken Jacobson, was involved in some of this as was the Fish and Wildlife Service, the EPA, the BLM, and many others. But if you look at the definitions of the three-parameter approach (soils, hydrology, and vegetation), perhaps as much as 3/4 of the surface area of the proposed reservoir would have one or more of those characteristics. Eight hundred ninety-two out of 1200 acres of inundation should have some wetland characteristic. Unfortunately that 892 acres found its way into the documentation, and it was hard for us to get rid of it. What the 892 meant was that each of those 892

had some value to wetland type species somewhere, whether it was one plant, or whether it was a true wetland, they didn't make a distinction.

Now in originally evaluating this 892 acres, the Fish and Wildlife Service thrust on the other federal agencies, who were doubting it at the time, the idea to use what's called Habitat Evaluation Procedures, or HAP, which is a model used to quantify the wetlands. In effect, they said let's take species that are commonly used to identify Rocky Mountain wetlands. i.e. beaver, elk, and yellow warbler. Let's go through an analysis, let's determine the value of those wetlands. If you did that for Rock Creek, you came up with a high number. If you did that for Muddy Creek, you came up with a low number. Well, that's great for looking at the comparison of Muddy Creek versus Rock Creek, but now that we had decided that the site on Muddy Creek was preferable, the agencies decided to take it one step further.

Let's use that same HAP process to determine how much wetland was there and how we can mitigate it. And that's really where the process kind of fell through and basically failed. And so the HAP process was very much a value in deciding which of the two sites was better, but it was not, as it turned out, a good approach to determine, or at least a good consensus approach, to determine whether or not, or how to mitigate those wetlands at Muddy Creek.

Now, when we looked at mitigation, we came out with certain results. In the analysis, we had an unfortunate situation where the original Fish and Wildlife Service person had some health problems and was replaced, and the new Fish and Wildlife person didn't like that approach. So, right in the middle of the process, the Fish and Wildlife Service switched their tactics, and said, "No, you can't use the HAP process. You've got to do something else." Well, the Forest Service and the BLM, who had been throughout the process with the same personnel said, "No. We started this approach, you put it on us, we're going to continue with it." Meanwhile, we have gotten some valuable lessons from it and I think we actually believe in it. We ended up basically splitting the process, satisfying the BLM and, to a lesser extent, the Forest Service.

Once we decided Muddy Creek was a preferred alternative, the Forest Service gave a sigh of relief and said, "Well, thank you. We're still a cooperative agency, but the BLM can take it from here." So we continued on that approach, but we also had to go through at the time a jurisdictional survey.

The jurisdictional survey cut the 892 number down to about 290 acres, during the transition from the Corps evaluation technique to the 1989 delineation manual. So then using that 290 acres, we proposed a mitigation plan that has about 440 acres in it, and that mitigation plan coincidentally satisfies both the HAP approach that the BLM uses, and another approach that the EPA was using based on risk. The EPA approach, I think, has a lot of merit to it if you look at it by itself. The EPA says that if you're going to replace a wetland, we want you to redo something, or to take a mitigation strategy that brings into the picture the fact that if you inundate one acre, and you have a mitigation plan that you propose to replace an acre, you have a 50% chance of success; therefore, you need to start with two acres in your mitigation plan so you can replace the one. So the EPA approach by itself made sense. The HAP approach by itself made sense, but the two really never meshed. They still haven't. It just so happens

our plan satisfies both approaches.

I might also add that since that time, I think we've looked at the inundation area and under a new definition that's being proposed, there could be as little as 60 acres of wetlands. So, you can see, is it 900? Is it 290? Under a new definition it could be as little as 60. And this is because of the history of Muddy Creek. You wouldn't have that problem at Rock Creek. But because of the history of Muddy Creek Basin where it has been pasture land, it's been irrigated. The stream is cut down. There are all kinds of problems there. The simple definition, something that comes out of a textbook, just really doesn't fit very well.

Now, in the process, we also went out into the field to collect a lot of data. Consultants actually looked at every acre. They looked at the vegetation on every acre. They looked at the hydrology on every acre and that included digging wells. They looked at the soils. Some of the wells were inconclusive so we went back the next year and took some transects, some lines between say here and the next building, and had a series of wells in that line. We read those wells twice a week, during the spring as the runoff started, when the runoff peaked, and then as the runoff dropped off, and we could see where the water level was with relationship to the surface. That information basically just verified the 290 acre jurisdictional determination.

I think as far as we're concerned there are some lessons here. The lessons are that in those areas that have been heavily impacted by man, heavily impacted by not just irrigation but grazing practices, where the stream has been cut down, is incised, where there is no real clear definition of what a wetland is, continuing agency discussions will help, but I have not seen anything that's being proposed that would have solved our problem. My understanding of the national policy is that it's not no net loss of wetlands, it's no net loss of wetland values. And that's a good objective.

On the Muddy Creek project, I think our wetlands issues now are behind us. I think we resolved them. I think our mitigation plan is going to work. I like it because the mitigation plan is immediately downstream of the reservoir and we're proposing to manage the reservoir and mitigation area as one continuous area. And I hope that in about ten years if you're going to be coming through the Kremmling area, you'll go north and take a look at the mitigation site as well as the reservoir.

Colorado Department of Natural Resources Report on Wetlands

Peter Evans

Colorado Department of Natural Resources

The Colorado Department of Natural Resources includes a wide array of agencies and interests, ranging from wildlife and parks to water resources, state lands, mining, and soil conservation, most of which, in one way shape or form, get involved in wetland issues. Now there are a couple of other state agencies, departments, that also have significant interests in wetlands, including Health and the Colorado Department of Agriculture.

I would like to respectfully disagree with one of the last statements Roger Mitchell made. I think maybe part of the reason we have such a controversy over wetlands is because we have all waited for Congress to solve the problem. I think that we need to be grateful for the federal government and for the national interests that have brought the value of wetlands to our attention, but wetlands is one of many areas of controversy where I think the solution is going to lie in all of us: in state and local governments, private citizens, corporations. Everybody needs to get more involved, figure out what the issues are and find out both how we can protect important wetlands and at the same time protect important property rights and development opportunities.

Having said that, I gather you've already heard that for a long time wetlands were regarded as relatively useless land. Today the controversy is between those who would like to preserve them for their intrinsic values and those who would prefer to develop them for other productive purposes. You've also heard, no doubt, that wetlands are scarce in Colorado. The numbers I hear from David and others are that wetlands constitute somewhere in the neighborhood of 1 to 3% of the land mass within our state boundaries. Some of the other numbers that we hear and which alarm us are that we continue to lose wetlands in the state of Colorado at the rate of about 5,000 acres a year. These numbers, to my knowledge, are not well documented, but they're certainly the best numbers we have to go on. They raise in my mind and in a lot of other people's minds significant concern about the consequences of continuing that loss rate.

There's a national wetlands policy forming, and it has already affected the way that we do business in Colorado. For over the last 20 years, federal government has expanded its authority and responsibility for the protection of wetlands to the extent that when any states have gotten involved, their efforts have been vastly overshadowed by that of the federal government. Federal efforts were already well underway when President Bush made his now famous comments about the no net loss policy, one that I suspect he regrets and is now trying to redefine. Since that time, the President has asked his domestic policy task force to look into just exactly what he meant. They've had a number of conferences around the country, and I gather from their silence that it's not easy for them to answer his question. At this point, there's no indication, however, that the no net loss goal will be abandoned.

Existing federal programs for the protection of wetlands significantly affect Colorado land and

water allocation decisions today, and we expect them to continue to do so in the near future. The question that arises then is whether there is an appropriate and an affordable role that the state of Colorado can find for itself to begin exerting the responsibility and authority that many of us believe rightfully is placed with the state under our federal system. How can the state begin to regain control over some of these fundamental policy decisions, land use and water allocation being primary among those?

I think that we should stop for a moment to recognize that wetlands represent one of a larger handful of environmental issues that are pressing in on us as a result of national policies, national trends, at a time when our leaders in Colorado are out promoting growth and development today. Growth and development, which will require the development of additional natural resources for human use necessarily at the expense of the natural environment. This comes at a time when, according to the Denver Post a week or so ago, 74% of the American public supports tougher environmental protection even if it means slower growth and development. Fifty-four percent, still a majority, support greater environmental protection, even if it means a loss of jobs in my community. I think it's remarkable when 54 to 74% of the American people agree on anything, but certainly if these kinds of numbers are true, it would suggest to me that we have a major conflict on our hands and our community leaders are pulling us in one way while the vast majority of the American people are pulling us another way. This comes at a time, of course, when we have all kinds of other environmental issues pressing in on our leadership, none of which make us very comfortable.

If you go and listen to some of the hearings before the House and Senate Agriculture Committees, where most of our environmental legislation begins, it becomes pretty obvious that they have not yet endorsed the no net loss goal. Nor are they very comfortable with the idea that wilderness areas need federal reserve water rights. Nor are they very comfortable with the idea that the protection, the recovery of endangered species, means that we need to sacrifice some of the resources we've already developed or even relinquish some of the expectations we have about future development. I think that we have all the indications of a nice controversy that will be with us for a while.

The state of Colorado is already under pressure from a number of different sources to adopt a state wetlands conservation plan. I'm sure most of you are aware that the federal government has had a tendency over the years to use its deep pockets to pass along a number of policies to us that otherwise don't have legal authority. Some of the most obvious ways that the state has begun to feel this pressure can be seen in some of the monies that we have received under the Federal Land and Water Conservation fund, which collects money from a variety of sources, but I think it's mainly taxes on hunting and fishing equipment. The federal government passes this money along to states for the acquisition and maintenance of parks and things like that. Colorado to date, I believe, has received approximately 45 million dollars under this program, and we've maintained our eligibility to receive those funds by approving a wetlands program. It's a fairly vaguely worded program at this point, and it was originally approved in 1986. Our approval expires this year, and I don't know what attention has been put at this point into taking that same document, dressing it up, or rewriting it, or maybe just carrying it back to the National Park

Service and asking them to re-bless it. But unless we secure their blessing for another five years, we lose out on a bunch of money. Now we don't know how much. The act has been in effect since '65, and throughout most of the Reagan era, those monies were embargoed, as a means to help under Graham-Ruddman and some of the other budget magic acts.

It's also my understanding that the Colorado Department of Highways has been under pressure to adopt wetlands policies, and specifically there's been a lot of interest among officials of the Federal Highway Administration in seeing the state of Colorado adopt the mitigation bank. As you just heard, Roger told you that we do now have a mitigation banking act. Whether this resolves their concern or not I don't know.

It's not uncommon for federal funding programs to carry with them policy requirements. So what the Department of Natural Resources has done is to coordinate with some of its sister departments and agencies to put together a process for evaluating the options that are available to us. It's a bit like putting together a federal regulatory puzzle. If there are any holes in the puzzle, the state has an option to fill those. So we're in the process of looking at those options. We expect to have a draft report available by the end of August which will look first at the federal programs, second at what other states have tried, because many other states have already adopted wetlands programs. We may soon be among a small minority that has not moved very far in that direction.

Some states have developed inventories, real inventories, not just maps, but inventories that tell you which wetland types are abundant and which are scarce, which are large and which are small on a drainage by drainage basis or a county by county basis, which could be very useful to use for planning purposes. Other states have taken over regulatory programs. Some have exceeded federal regulatory requirements. Other states have used their state lands as a means of pursuing the no net loss goal on their own. Others have pursued non-regulatory means, such as tax and financial incentives, land acquisition, some of these kinds of things.

What we'd like to do is to lay all of these out in a draft report, convene a conference in Denver which we've tentatively penciled on the calendar as September 26th and 27th, and this year use a very generous grant from the EPA to fly officials in here from a variety of other states to tell us whether they've had a good experience or a bad experience with wetlands protection as they have pursued it. Would they do it again? Would they do it differently? Why did they do it? We are trying to educate ourselves, our legislators, our lobbyists, about the options that are available to us, and, very importantly, the cost to us of not doing anything. Following the conference, we will try to wrap all that information together and put it into a final report which, to the extent we can, will include recommendations for legislative action, for administrative agency action both at the state and local government level. Also, if there are programs that look like they are productive in other states that have been undertaken by non-profits, or by private corporations, these will be included. Everything's on the table at this point, and I would encourage you all to come to our conference, and to comment on our draft if and when we manage to free it from the typewriter.

This study will help us evaluate options for Colorado. We are evaluating our ability to protect

valuable wetland resources, protect important property rights, development opportunities. We are examining the efficiency and equity of the various decision processes that any development or protection decision typically goes through. We want to look at both regulatory and non-regulatory means of protecting important wetlands. Finally, we want to look carefully at the allocation of responsibilities and the associated priorities between the local, state, and federal levels of government.

We're not proposing a new program or a new policy. I hear lots of people express reluctance to see another government agency get into this. But to the extent that I have any say in this program, we don't have an agenda. We don't have a preconceived outcome, and so we'll be very dependent on special interest groups, individual citizens, corporations, municipalities, county governments, federal government agencies, everybody, looking at what it is that we're laying out in terms of state options and helping us pick one or more that makes sense.

Wetlands: Questions and Answers

Question: Mr. Mitchell, what would be an incentive to you to maintain wetlands on your property? And what sort of incentives would encourage the people of Gunnison to create wetlands?

Mitchell: It's awful hard to fight the incentive to make a living. I mean that's my incentive, to buy food for my family. When that's threatened or taken away from me on the farm, that's the way I'm making my living. If that's designated a wetland, there's no incentive that I could construe that would ever outweigh making a livelihood for my family. As far as wetlands, there are some wetlands that there's no problem with. I mean I'm for keeping wetlands, but when they're right there in the middle of my field that I'm trying to farm and make a living, that's a number one priority to me is to make a living and pay taxes.

Panelist: I think maybe the mitigation bank will help to address that problem by providing a means of compensation for a farmer or rancher who has wetlands on his property, finds them useless, finds them a frustration, but may be able to sell some kind of mitigation credit, which would leave the wetlands there, at least for the life of some project, and result in money in that farmer or rancher's pocket.

Panelist: Can I add something? One other thing that should be thought about this is that wetlands in an agricultural landscape are very, very, very valuable, because agriculturalists use a lot of herbicides, and fertilizers, and things like that. We really have a lot of ground water pollution problems in our agricultural landscapes, and wetlands are the ecosystem that can deal with these problems, particularly nutrient issues. Nitrates, which pollute most of our groundwaters in the interior United States can be denitrified in wetland systems, and we really need wetlands integrated into fields like Mr. Mitchell's and other areas. And if we have to work with them to help them develop wetlands in areas that aren't problems for them, then we need to work with them. But we can't just mitigate all these wetlands and get rid of them, because we have some real groundwater problems, and ignoring them is not the issue.

Question: I have a question also for Mr. Mitchell. Where do you draw the line as to whether the private landowner can or cannot destroy wetlands? I understand you need to make your living, but everybody can say that and people are developing our wetlands and growing agricultural products on wetlands, etc. (Inaudible). As a continued discussion of wetlands, where do you draw the line that says you just can't destroy wetlands?

Mitchell: I think the main issue is to come up with a workable definition of what a wetland is. Like Ken, I think, was explaining up here three of the different means of identifying a wetland. If they meet that criteria, you know, we might be able to live with it. But if there's just one criteria, like your vegetation out there, those cotton-picking water grass or willows will grow anywhere, right on a flat area.

But if there is a wetland that will meet those three requirements, I mean I think we could talk about that. I think it's all in the definition of what the wetland is. As far as I'm concerned, yeah, it hasn't really been decided, or at least explained to me.

Question: Mr. Jacobson, when you're looking at some land and trying to figure out if it's a wetlands or not, the land must fit all those three criteria to be a wetland, right?

Jacobson: It has to meet all three criteria, and it can't be irrigation-induced through artificial application of irrigation water. I want to say something about what Eric talked about earlier in terms of Muddy Creek. The reason that Muddy Creek became such a problem is because when the proponents' consultants came to us early to coordinate in terms of the wetland issues on Rock Creek and Muddy Creek, they asked if we cared if they used the Cowarden Approach to delineating wetlands. That was very much an error that the Corps made at that point in time. We were not reluctant to do that, because the proponents' consultants indicated at that time, well, it doesn't really matter how many wetlands there are because they're going to mitigate for all of it. The Cowarden Approach is the old approach used by the Fish and Wildlife Service wherein the Fish and Wildlife Service agrees that it takes three of these criteria to really make a wetland. They've furthered their definition by stating that there need be only one of those parameters to be a wetland. And that immediately threw their project into a state of flux. We were a little bit naive, you know. I have no problem calling areas wetlands if they aren't by the three parameter approach if they're going to be mitigated for. I mean I would be foolish as a wetland proponent to do that. But I think, in terms of the definitions of wetlands, there's a relative consensus among the agencies that all three parameters must be met in order for an area to be called a wetland. I think development of the Federal Manual has come a long way in drawing those agencies together, and a lot of problems are going to be avoided in the future.

Mitchell: I think it was David over here that brought up the issue of water contamination. This is a major issue with us in agriculture, because we have families, we have kids that live in the area. The wetlands, no matter how many, they're not going to take care of a problem that may be starting. The only way it can be taken care of is for the farmer to take care of it himself. We have a chemigation law in Colorado. It takes about \$2000 per sprinkler to safeguard that sprinkler so no nitrates, no chemicals will get into that underground water. In the San Luis Valley, I'd say it was 100% participation and compliance with this law. It costs the valley a lot of money, but we live there and we want to keep that underground water clean. And it's miraculous how we are cleaning that up. The only reason we use the nitrates is to keep the food produced so there's an ample supply so the cost isn't so high. If we had to go back to the old type of manure fertilization, well, for instance, when I was a little kid, we were raising 50 to 100 sacks of potatoes per acre. We were one of the better farmers in the valley. This was 35 years ago. Now, through the conscientious use of nitrates and certain chemicals according to label, we're raising 500 sacks. This gives you an ample supply of food. There's so many more people coming

into the country now. They need to be fed. If we go back to the manure-type fertilization, they're going to be paying a lot of money for that. We're going to have to convert more wetlands to agriculture in order to have enough land to produce enough food to feed all the people.

Question: Mr. Cooper, it appears to me that as farm people more and more try to increase our on-farm efficiency, we heard numbers yesterday approaching 95% on-farm efficiency, that you could get to point that an increase in on-farm efficiency could hurt wetlands. Do you see a collision path ahead on issues like that?

Cooper: So you're saying these wetlands will become so valuable as agricultural land that we'll have to drain them or fill them?

Question: The improved on-farm irrigation systems could dry up wetlands.

Cooper: Right. Well, clearly, agricultural impacts are the biggest in the country. There's no doubt about that, and it's something that we really don't have a very good handle on, you know, how much wetlands are dried up each year by agricultural uses. I really can't answer your question. I'm sure it's a huge issue, but it's one that we haven't looked at at all.

Question: Question for Mr. Mitchell. You mentioned your 70 year old neighbor whose ability to continue farming was threatened, and I was curious if you could elaborate on that a little bit. I understood that under the '85 Farm Bill, prior converted wetlands were grandfathered and people were allowed to continue to farm, and under 404 there's a normal farming exemption. What sort of a determination is threatening his ability to farm?

Mitchell: The way I understand this, this individual that I'm talking about, wants to get out of the farming game. He wants to sell his farm to a neighbor. And from my understanding, if this ground that he has there is declared a wetland and unsuitable for agriculture, he is not going to be able to sell that for farming, because if I buy it, I can't farm it, so I'm not going to pay him X amount. It would be worth, actually, nothing. He'll be sitting there with it and no one will buy the thing.

Audience: I don't understand that.

Audience: Interesting. It's different from what other people seem to have said about how the acts work.

Question: Eric, in regard to Muddy Creek, will you explain what was done in the way of mitigation and how that will over a period of time be enhanced?

Kuhn: The mitigation package on Muddy Creek included basically three components. First, we're taking grazing off of some existing areas, and I'll call that the most minor component. The second is that we're restoring vegetation in the mitigation area, putting vegetation improvements. And the third thing is we're putting in four separate irrigation systems to improve the water supply to existing wetlands and provide water to areas that have historically been wetlands but now no longer have the hydrology because the stream has cut down through the banks and the hydrology isn't there. Those impacts are on a total of about 440 different acres, 440 acres downstream of the dam. I think area that will actually receive irrigation water is about 350 or 360 acres. So effectively what we're going to be doing is the same thing that ranchers have done historically in there except we're going to grow vegetative type species and not allow grazing in there.

Audience: We've heard that we're looking at a national wetlands classification system. How would you do that? You've shown us the different varieties in Colorado, they're quite distinctive. How would you rank wetlands nationally?

Cooper: Boy, that's going to be a mess. This is the Corp's new initiative, obviously, to somehow come up with a matrix of different wetland types and different wetland functions, and a value of each wetland type for each of these functions: groundwater recharge or discharge, or some nutrient functions, or wildlife. For Colorado, we don't even have a start on a classification of what kind of wetlands we have. I mean we have a start, but it's very meager. And then to try to develop a data base on the value or functions of each of those wetland types in Colorado so that we can develop a ranking, we're a long way from that. I think you could do it. It's kind of the way I've been doing things in my work in South Park, or Telluride, or Boulder, or other areas, is to go out and develop classifications of the kinds of wetlands in each region of the state. You can develop a state-wide classification and then for each of those major wetland types, do some individual studies and develop some perspectives on how valuable those wetlands are for each of the different functions. But it's going to be a long process, because, remember there's only a couple of people actually doing scientific work on wetlands in Colorado. There's a lot of complaining, but not much data being put out there that we can use to advance our perspectives, so that's the problem. You know, my answer's not very good. I know how to do it, but we're talking about a small team of people taking a lot of years to forward that.

Audience: Mr. Jacobson, you referred to the federal program for wetlands being under revision, and going through some kind of review process or projection. What is happening?

Jacobson: I don't know what the projection is. I've seen draft as to what it may look like. The significant revision is the definition of wetland hydrology. Right now if you can demonstrate that at a level 18 inches, that would suffice to meet that criteria. Under the new revision, that would be extended to inundation or saturation to the surface. That's the major component change that I see. I don't know

when it's going to be available. I do know it's available in draft, and there's an EPA hotline that can be contacted to get access.

Endangered Fish Recovery Program

John Hamill, U.S. Fish and Wildlife Service

Tom Pitts, Engineer, Pitts and Associates

Dan Luecke, Engineer, Environmental Defense Fund

Moderator: Eric Kuhn, Colorado River Water Conservation District

Kuhn: We heard a little bit this morning about endangered species from Reed Harris. The panel we have today, or this morning, is going to go into it a little bit more. My name is Eric Kuhn. I'll be the moderator. On the panel we're going to have Tom Pitts, John Hamill, and Dan Luecke. I'm going to give each one of them a few minutes to give a little opening statement, and then I think we'll all have a couple of questions, and then we'll open it up to the audience. To give you a little background on each, Tom Pitts represents the water users in the recovery program effort. Tom works for the water users in the Upper Basin, including the states of Colorado, Wyoming, and Utah. The Colorado Water Congress has a special project that funds his efforts. Tom is a consulting engineer from Loveland, and he has a great deal of experience on this and many other matters. The second member of our panel is John Hamill. John is in the hot seat. He is the program manager for the Endangered Species Recovery Program in the Upper Basin. John is a biologist, I believe, by profession, and a politician in reality whose job is to make this program work. Finally, Dan Luecke. Those of you who were there this morning heard the introduction on Dan. Dan is the representative of the Environmental Defense Fund. He's been very active in Colorado Basin issues. We'll start with John Hamill who can give you an overview of the program, then we'll go to Dan, and then we'll go to Tom, and then each one of them will take ten minutes and we'll leave ten minutes or so for questions and time to get over to Keating Hall for lunch.

John Hamill, U.S. Fish and Wildlife Service

I think the process that we have for addressing endangered species issues in the Upper Colorado River Basin is really a lot like the process that B.J. Miller described yesterday in trying to deal with some of the water resource issues and environmental protection issues in the Sacramento Delta area in California. The Endangered Fish Recovery Effort really came about as a result of an almost unresolvable conflict between water resource development and recovery of the endangered fish in the Colorado River Basin. There were several unsuccessful attempts by water users back in the early 80's to try and amend the Endangered Species Act and to go to court to try to get relief from the Endangered Species Act as it related to these endangered fish. Ultimately, I think there was recognition that such relief was not going to come from either from the courts or Congress, and the best thing to do was to sit down and intelligently try and work towards recovering these fish in a way that was going to allow for water

development to continue in the Colorado River Basin.

I think one of the key ingredients, and B.J. Miller talked about this, was participation by all of the involved parties. In this case we have three states, the states of Colorado, Utah, and Wyoming, several federal agencies, the Bureau of Reclamation, the Fish and Wildlife Service, the Western Area Power Administration, Dan's contingent, the environmental groups, also the National Audubon Society, and Colorado Wildlife Federation, Wyoming Wildlife Federation were involved, and the Tom's constituent groups, Colorado Water Congress and parallel groups that existed in both Utah and Wyoming.

What came out of about three and a half years of fairly intense discussions was this Recovery Implementation Program for the endangered fish. It was signed in January of 1988. Through a formal cooperative agreement it was signed by the governors of the three states and the Secretary of the Interior and an administrator of Western Area Power Administration. Subsequently, there were formal resolutions supporting the program from environmental groups and water development interests. It's really, I think, a very unique example, of not only how you deal with water issues in a cooperative manner in the state, but also endangered species issues, and there's no parallel example in the country that I'm aware of where there is this kind of collaborative effort to try and solve problems through cooperation instead of confrontation.

What I would like to do is focus on two or three things. Basically, focus on the discussion, and I think the topic of our panel is kind of the relative role of water acquisition and protection of in-stream flows versus stocking and use of hatcheries in the recovery of these fish. Those are two very different aspects of the program. The program makes provisions for both of those. There's different philosophical perspectives on how you should use hatcheries versus going out and trying to protect natural habitat. What I'd like to do is give you an overview of kind of what the program says about stocking and acquisition of water rights and then give you some of the Fish and Wildlife Service perspectives and philosophies, and then we can get different perspectives from Dan and Tom as they see fit.

There are five elements to this program. Two I just referred to, habitat management and stocking. And I'll spend a little bit of time talking about those in more detail. There's heavy emphasis on in-stream flow protection in this program. And in fact, over half the budget of this program over its fifteen year life which is estimated at about \$60 million, is directed towards protection of habitat. And we'll talk a little bit about why that's the case. The other elements, habitat development and maintenance, are commonly referred to as non-flow types of alternatives. What can we do from an engineering standpoint; it was what Reed Harris called an engineering fix. Can we build fish ladders? Can we build habitat in the river structurally to take care of these fish? There are about forty-some species of introduced fishes in the Colorado River System which play havoc with the native fish community. Sports fishing in certain areas also has an impact in terms of incidental take on the populations.

The final component of the program is research monitoring. There's a lot we don't know about these fish. We've only been studying them intensively for about a decade, which may seem like a long time, but in terms of real knowledge, that is not a long time. We've been studying trout for four or five

hundred years, and we still don't know a lot about trout. So anyway, that gives you a flavor for what the major elements of the program are.

Before we go very far in understanding the relative role of stocking and water acquisition in the recovery program, I think it helps to look at the goal of this program which is to establish self-sustaining populations and protect the habitat upon which those populations depend. That's not only consistent with the Endangered Species Act but it's also the stated purpose of this program. The fish population maintains itself over the long term by natural reproduction and recruitment. That's the goal of the Endangered Species Act, and that goal has been carried forward to this program. The program will try to achieve this goal in fifteen years, and ultimately, we hope, after the populations recover, the three endangered fish can be removed from the endangered species list.

What about habitat management in between flows? Also, water acquisition? What's the goal of this program? It's to protect sufficient in-stream flows to support self-sustaining populations of these fish. And by that we mean providing water at the right location and the right quantity at the right time of the year. And these fish occur over about 800 miles of habitat in the Upper Colorado River Basin. And how are we going to do that? Well, the Fish and Wildlife Service has developed some preliminary flow recommendations for the Colorado River System, and basically, in summary form, and I think Reed and others refer to this, they call for a kind of restoration to a more natural type of hydrograph in the river system. Those are preliminary recommendations. They are not generally accepted within the program, and they are undergoing refinement.

The strategy for trying to meet those flow recommendations is to actually go out and acquire water rights from willing sellers, and this would all be done in the context in the state system, Colorado's in-stream flow program, or Utah's in-stream flow program, and then convert those water rights to in-stream flows. The blue areas shown in the slide are priority reaches for the fish, and they're also areas where there's no major dam which we can tap to provide water for those fish in those regions. These other areas, Aspinall and Flaming Gorge, are two of the areas that Reed Harris talked about, and the intent there is to re-operate those facilities to provide flows in the orange areas of the map. So, a lot of the in-stream flow needs of these fish is going to come out of federal reservoirs. That's why there's a major focus in this program on completing those Section 7 consultations.

Rudeye Reservoir has been in the news lately. We had a previous agreement with the Bureau Reclamation to provide 10,000 acre feet of water out of Rudeye. We advanced another request to the Bureau this year to provide an additional 10,000 acre feet. It's my understanding that the Bureau is going to respond favorably to that request. But that water is targeted down into the infamous fifteen mile reach just above Grand Junction, which has been an area of focus in the program for quite a while. We're also looking at other alternatives for providing water in those sections of the river. So that's a short review of what's going on in in-stream flow protection.

What about stocking the native fishes? The goal of our Propagation and Genetics Management Plan is to produce hatchery-reared fish to support research and recovery activities. And by that I mean there's a need; we can learn a lot by having hatchery-raised fish. In a controlled environment you can

do experiments to assess what their habitat requirements are. We also have a need for stocking some of these species like the bony-tailed chub, which is almost on the verge of extinction. The only way we're ever going to get it back in the system is to stock it. Razorbacks have not reproduced in 25 years or so, and it's very likely that we're going to be introducing razorbacks. Squawfish are not in any imminent threat of extinction and they're not as high a priority in the program right now as far as reintroduction or stocking.

Another important aspect is we have wild fish out there, and if any of you are familiar with the problems in the Pacific Northwest, you'll know that one of the major problems is that there hasn't been much regard paid to those wild stocks of salmon, and they've built hatcheries and just dumped jillions of hatchery-raised fish into the system, to the detriment of the wild fish. So one of the things we're doing is being very cautious about not messing up the genetics of the wild populations. And so one of the priority things is to do genetic surveys of all the wild populations to figure out what kinds of different stocks we have.

We also are trying to establish refuge populations. Many of you are familiar with the recent news on the Sacramento River up above Shasta Reservoir in California where we had a train that went into the river and killed forty miles of the river. That's a very real possibility in the Colorado River Basin. And the way we protect against that is having refuge populations of fish and bringing them into the captive environment so that if something like that happens, we always have a stock that we can rely upon.

The state of Colorado is doing a study to look at the feasibility of building a hatchery in Colorado. And that study will be completed in about March of next year. We also have a facility in Utah that the Fish and Wildlife Service has developed. We received a million dollar appropriation last year for expansion of that facility.

Another interesting aspect that relates to stocking is many of these fish are migratory. Squawfish used to be called the Colorado River Salmon, largely because it migrated several hundred miles to and from spawning areas. One of the things that we don't understand very well is how does it go back to the same spawning areas every year? That's a critical question that has to be answered. You just stock fish back into the river without knowing how they imprint or home back in on an area, it's very likely these fish could be kind of wandering around aimlessly, looking for a place to spawn. God help us.

So, in conclusion, in-stream flows are very critical to meeting the fundamental objective of the recovery program: establishing self-sustaining populations. We look at hatcheries and stocking as an important tool, with emphasis on the word tool, toward achieving that goal. But it's not a solution by itself. I think those are principles that are embedded in the recovery program, embedded in the Endangered Species Act, and I think that's what's guiding our efforts to implement both of these aspects of the program.

Question: How much does the program cost?

Hamill: How much does it cost? It's a fifteen year program. It has an annual budget of about, I think,

\$2.7 million. There's also a fund that we look to Congress to ultimately appropriate up to at least about \$10 million for acquisition of water rights, another \$5 million for capital construction projects like building hatcheries or fish ladders. Total cost is about \$60 million over a fifteen year period. Well, I used to say it's the largest recovery effort for an endangered fish, but I think now that we have salmon in the Pacific Northwest it would probably be much smaller than that.

Dan Luecke, Environmental Defense Fund

In talking about the recovery program, I wish I could say the EDF really had used foresight in thinking about what it was doing in becoming involved in this process, which we didn't. It was very incremental. Some years ago, an attorney who was on our staff at the time, Jim Martin, who has since gone to work with Senator Wirth, was kind of hanging out at the office one day with little to do and a call came in from somebody in Trout Unlimited. They were getting tired of going to these meetings and wanted to know if someone else would go for a while, and so they said, "Jim, you're low man on the totem pole, you go." So we did become involved almost by chance, but it wasn't as though there weren't some principles behind it, some concerns that we had. The first one being, I think, concern as much for the Endangered Species Act as for the endangered species.

The environmental community is always uncomfortable with attacks on the Endangered Species Act, and also, with political problems that the Endangered Species Act has caused us over time. For example, Tellico Dam and the snail darter, from another era. These odd little species that seem to be holding up these very important projects. And since we don't like to answer questions about species that have funny names, we look at the Colorado River and the squawfish and the razorback, and thought, "Oh, man, that's not going to do us any good in the newspaper. Maybe we should get involved in this somehow so we don't have to deal with hand wringing over saving those species at some time in the future when someone wants to build a big dam someplace." So there was that kind of concern.

The other part of it, at least in my view, and I don't know how widely this might be shared in the environmental community, but we don't see many new, big dams in the Upper Basin. In fact, personally, I don't see any new, big dams or projects in the Upper Basin. So I wasn't terribly concerned that by participating in this recovery program, I was thereby making it possible to build projects that I might otherwise object to for some reason or other.

Once EDF became involved and the environmental community became more involved and started thinking about what we really wanted out of this process, in addition to providing some measure of political protection for the Endangered Species Act. Well, we thought what we wanted was flows. We wanted water in various places. That was the habitat characteristic that was most important. And we looked first at purchased water. At the purchase of water from conventional uses, agricultural, or municipal, and then conversion to in-stream flows. You saw the chart that was put up by John and showed those stretches of the river where the purchase of water could make a difference. It's primarily

the mainstem of the Colorado, it's the White River, it's the Yampa River.

The other component affecting habitat is the change in the way that federal reservoirs operate. Dam operations effect habitat in the Green River downstream of its confluence with the Yampa, and then the Gunnison River, and then the mainstem of the Colorado all the way down to Lake Powell. Just in terms of miles, you can see that there were more miles of habitat affected by dam operation than by withdrawals by appropriation. From my point of view, that's the more important place to look, although all of those reaches are priority reaches. In addition to that, we haven't seen much progress on the purchase and conversion of water rights. It just hasn't happened. And I've come to the conclusion, and this is only my conclusion, that what we need to examine is the way in which the federal reservoirs operate. Basically, Flaming Gorge and Blue Mesa or the Aspinall Unit. I would like to go back to a little debate we had in a previous session in terms of what the cost associated with that might be.

You may recall that in that previous session, in referring to an analysis that was done of Glen Canyon, the Environmental Defense Fund concluded that even in the worst case, which was the base load Glen Canyon and run the same amount of water through there, day in, day out, year in, year out, we're talking about a change, an increase in operating cost at Glen Canyon of about \$8.9 million. Western was saying, "That's not right. It's probably closer to \$30 million." And the basis of the difference between the two of us seemed to be this question of capacity and the purchase of capacity. I'd like to use this chart just to lay out what I think the difference is in our arguments. We have Rick here who can give his view on it at some point if that's necessary, but let me give you my version of it right now. Let's say that this is time, all right, and we'll make this vertical axis kilowatt hours of electricity and a pattern of generation that might look something like that. Or, if you want to use it differently, we could say this is the way we use our capacity in kilowatts. And if you multiply it, and you say this is a one year period from January through December, and if you take the full area under this curve, then you have the kilowatt hours of electricity generated during the year. And this might be the way in which you'd use a peaking facility. And if you used it differently and base loaded the facility, generating exactly the same amount each day, day in and day out, you're generating the same amount of power during that period.

Well the question is, basically, what do you do if you have only one facility, and that is Glen Canyon? And that's the only place you produce power. And this is the pattern of demand for that power, then the fact that you can produce some out here on the shoulder and out here doesn't do anybody any good because nobody wants it. All right. But the point is Glen Canyon fits in a larger system. And in fact, that larger system has other units of capacity. If we said now here's the river and here's the dam and over here, we have a power plant, all right? These two units are part of the same system. And we have other power plants around as well.

What the Environmental Defense Fund would argue that you can do is when you're not producing this because you're running the system this way, then you purchase power from this facility, because in the short run, there is excess capacity in the system in the Southwest. All right. So you don't have to go out and buy a power plant. You don't have to purchase capacity, because it's already there. That capacity's already there.

What about the long run? In the long run you're going to have to do something different, and you're right, and in the long run you will. But in the long run, the larger question becomes one of, do you try to shave the peak? Do you invest in conservation in the long run, both to shave the peak and perhaps reduce this entire volume, or reduce at least the rate at which it grows. And if you do have opportunities for shaving the peak, or for investing in conservation, then the analysis that you do is not an analysis against the construction and purchase of new capacity, it's against the next least expensive alternative, which in almost all cases is conservation.

So in the short run, you don't have a capacity problem, because it's the capacity of the whole system that you have to look at. In the long run, I would argue, that it is not only system capacity but alternatives to capacity both being conservation or peak shaving that you have to look at.

I think that the real test of the recovery program in the Upper Basin is going to come in the way in which we manage or analyze or assess the change in operation of Flaming Gorge and the Aspinall Unit, primarily, Blue Mesa. If we can change the way in which those dams are operated right now, and if we truly analyze the cost of doing that, we will come to a change in flows in the river which will improve habitat, improve the chances for the endangered fish species and will realize as well that the costs aren't the costs associated with building the capacity, they're costs associated with changing the way we manage the overall system of the Southwest.

Tom Pitts, Pitts & Associates

We've been requested to discuss the role of stocking and the role of water acquisition and recovery program. John mentioned that there were five recovery elements. Water users support implementation of all of those recovery elements but think all of them are necessary if we're going to achieve recovery within this fifteen year time frame. We're pretty serious about the fifteen year time frame. We'd like to see that done within the fifteen years that we agreed upon, so there is some pressure there. By the way, we're now in our third fiscal year of the recovery program.

We're recommending full pursuit of all the possible means of recovery including stocking and water acquisition for in-stream flows. Concerning stocking, when this program got started, or at least we got involved in it back in 1984 and started having negotiations with the Service and the states, there was a lot of concern by the federal and state biologists that one of the parties of the program, such as the water users, or one of the states, or all of the states, might come in and say, "Well, the answer to this problem is to stock fish, these endangered fish, throughout the Upper Basin. And that'll solve the problem." Then frankly, there were some other people who thought that would be the solution as well. But as we move along now in the third year of the recovery program and the fifth or sixth year of dealing with these endangered fish, I think we've come to a more sensitive or intelligent conclusion about how we ought to be using stocking.

Stocking, from our viewpoint, ought to be used to meet recovery goals. It's an essential part of the program. It should be used intelligently. We think that we should consider the maintenance of the genetic diversity of the endangered fish in the basin, and the water users have supported some of these very long term and expensive genetic surveys which John mentioned to identify the genetic diversity in the basin, what the stock is, and to see what we need to do to maintain it. Because it tells us something about how we're going to do stocking programs. We're looking at different populations, the razorback sucker, and chubs, and squawfish, and if those populations are genetically the same with any species, it says, here's one approach you can use to augmenting populations. If they're different, then you need to use a different approach to augmenting populations to maintain that diversity. We support that.

We also support the other activities John mentioned, about the establishment of refuges to protect the genetic material. That needs to be done. The Hatchery Feasibility Study, which is being conducted by the Colorado Water Conservation Board and others who identify what a hatchery believes a species would look like, and how it should be used. And finally, there is some degree of research that's needed to find out how we operate a hatchery, how we can maintain these fish in a hatchery. So we're supporting that and, like I said, we think that's going to be an element of the recovery program.

We don't envision that there will be the kind of stocking program that you see to maintain our trout fisheries. A lot of those fisheries are put-and-take fisheries, and we've put a lot of trout in the river and a lot of them are taken out by sportsmen. That's the objective. We don't see that level of stocking occurring with these endangered fish. We think that the stocking programs ought to be designed to meet the specific recovery goals. If the recovery goal says we need a population of squawfish in the Colorado

River between Palisades and the state line, that's one of the places that we ought to be using stocking. That's a very low population right now. There are some other places too.

John mentioned razorback suckers, they're not reproducing. If we're going to have a population of razorback sucker in the basin, we're probably going to have to pull that genetic material out and use it for brood stock and put those fish back in the river. Until we can deal with the more direct problem of predation by exotic species on razorback sucker.

On the role of water acquisition, water users have had some conditions, I guess, when we went into this recovery program. We had some goals that we wanted to see accomplished. One is that the recovery program with respect to the state water right system, interstate compact obligations, and then the cost for the program would be equitably distributed. So the program as we negotiated it will, in fact, use legal protection of flows under state water law to provide habitat for endangered fish. And that was very fundamental from the water users perspective, because implicit in that is the recognition of other people's water rights. And that's one of the things we wanted out of this program. The other thing is that the quantity of water appropriated or acquired for these endangered fish was related to their needs and pretty well affected their needs. That was important to us because we see the goals of this program as not only the recovery of endangered fish but to have endangered fish recovered while water development proceeds in the Upper Basin.

As John mentioned, the program is going to proceed. Under state water law we're going to acquire and appropriate flows and convert them to in-stream flows in various reaches. Even going and using the federal reservoirs we think still requires a cooperative venture between the states and the federal government because the states administer those flows in the river. So the element of cooperation needs to be there as well.

Some of the activities we've got going in the way of water acquisition are we doing a feasibility study in the Yampa River Basin on reservoirs in conjunction with the Colorado River Water Conservation District, and what we're looking at there are some alternate reservoir sites that would meet the economic and water supply needs to the Yampa Basin and possibly as an alternative to the Juniper Cross Mountain Project. If we find one of those sites and get it funded, the Colorado River District has indicated a willingness to consider some kind of an arrangement where these flows from Juniper Cross Water Right could be converted for endangered species habitat use.

On the Fifteen Mile Reach, the Bureau of Reclamation is looking for alternate sources for that reach. Cross Mountain Ranch, a nature conservancy, which we work very closely with in the program, is seeking to buy a ranch that includes 8,000 acre feet of senior rights. Those rights, once acquired, would be transferred and become in-stream flows for the endangered fish. And I believe they are expecting an appropriation for that purchase in FY92.

Dan mentioned, and I think John, perhaps, too, that we haven't gone out and bought any water. And that's true. We've been looking at proposals to buy water. People have been sending them in once they know that we're in the market, to some degree, and so far we haven't really seen any proposals that we thought would provide enough benefit to endangered fish to go out and use the money to buy them.

We continue to look, and I think we'll be doing that a little more aggressively in the future. So far no purchases of water.

In terms of balancing the recovery program activities, as I said, we think all five elements need to be carried out. There are two things that we, I guess, harp on in the recovery program, and one is the control of non-native fishes. That's a serious problem. If it's allowed to go uncontrolled and nobody does anything about it, we're probably going to eliminate razorback sucker in the Upper Basin. It's a difficult problem. It's difficult politically, and it's difficult from a science and management standpoint. What do you do with a river that has forty species of introduced fish in it, and how do you control those? We're just beginning, I think, to start focusing more on that as we learn more about the impact there. And there are political consequences, because those exotic fish constitute part of the cash register for the State Divisions of Wildlife.

A few years ago when I proposed to a former director of the Colorado Division of Wildlife that we ought to place restrictions on the stocking, he kind of went through the ceiling. He wasn't very open to that. But if we are going to dedicate irreversibly the water resources of the state's people to this endangered fish program, then we ought to be equally diligent in finding ways to deal with all the problems affecting those endangered fish, including the non-native fish.

The other area that we are concerned about is the setting of specific, quantifiable recovery goals for these fish. We don't have those. We've got some broad, general goals which are not supported by much in the way of data or analysis, and we would like to see the recovery program advance in that area.

We need to be able to say we need six populations of squawfish in these areas, and these populations should be at these numeric levels. That hasn't been done, and it needs to be done because realistically, if we had those, they would be guiding implementation of this program more than they are now. The water users will continue to support the program as long as it meets the basic objectives of recovering endangered fish, allowing water development to proceed, recognizing state water rights, and distributing the cost of recovery equitably. Thus far, we think these criteria have been met, and we will continue to work with the program to see that its many objectives are achieved.

Endangered Fish Recovery Program: Questions and Answers

Ed Toner: Well, this is a question for any one of them including the audience. You know there's a three hour time difference between the East Coast and the West Coast. In hydropower studies in the West, has any consideration been given to tying into the eastern or mid-western power grids to level out our need for this peak power that we're getting out of these plants right now?

Luecke: The analysis of Flaming Gorge hasn't been done yet. We really need someone here from Western or maybe from the Bureau to describe exactly where Flaming Gorge fits into the grid, but moving that power, or wheeling it to the east would be an enormously expensive proposition and the major markets that you think of if you're going to wheel it are on the West Coast, not back into the Mid-west or beyond.

Kuhn: Ed, also, my understanding is that on the West Coast, basically, west of the Rocky Mountains north-south is a pretty good tie-in. And when you start moving from the west to the Plains to the mid-section of the country, then there's some substantial problems with that tie basically based on transmission capacity and losses and those types of things. Rick, do you have anything to add on that?

Gold: I don't have anything substantive to add. I would agree with your assessment, Eric. There are, I think, some minor inner ties. With, for instance, I can tell you last year when we were holding constant at Glen we brought power from as far away as Montana Power Company to service the loads that were not being serviced at Glen. But it's a transmission issue, and I think that's the key point. It would take some horrendous transmission lines to get that job done, but it's the right idea. Somehow find a market where the peaks don't all line up.

Kuhn: And that is being done from the north to south. An example of that, of course, is Pacific Corp, which has grown from a small company in Oregon to something that was looking at buying up Arizona Public Service. So you can see with one power company extending from the Columbia River to the border of Mexico there is a considerable tie-in west of the Rockies.

Question: Mr. Pitts stressed the need for water development to continue. What kind of water development are we talking about, and how will it affect these endangered fish? I know here in Gunnison County we're dealing with two proposed major projects right now. One is a transmountain diversion project that Arapahoe County wants to build; the other one's a 1,000 megawatt peaking power project up in the Taylor Basin. Can we have enormous new major projects that aren't going to harm this Endangered Fish Recovery Program? It seems as though we're having a lot of trouble dealing with the projects we've got. How are these new proposals going to affect the fish program?

Pitts: To my knowledge, I don't think these proposals have been evaluated in the context of their impact on endangered fish. I don't know. We set up a mechanism, recovery program, that's a recovery program offsetting future depletions, and that was our intention, and I think that's the agreement. Those kinds of projects are not going to have an adverse impact on endangered species. That's the objective.

Hamill: I might comment that the objective of the program is to allow for both water development and fish recovery to occur simultaneously. We have the responsibility also to insure that any water project that comes before us is in compliance with the Endangered Species Act. One of the things we routinely do is evaluate how much progress this program is making towards things like acquiring water rights and reoperative federal reservoirs. We're looking at the populations of the fish to see whether they're responding to those things. And we use all of that when we issue our biological opinion on a new water project. There is no "guarantee" that water development can go forward, but I think there's a hope that through implementing this comprehensive recovery effort, we can bring the fish back, and there isn't in reality a lot of pressure for new water development. We have some time to make this program work and hopefully get the fish back on the rebound, and that would ease things up from the standpoint of new water development.

Question: John, I have a question. With respect to the additional 10,000 requested out of Rudeye, what was the technical basis that Fish and Wildlife Service had to make that additional request? Do other biologists agree with the need for that initial amount? For the Fifteen Mile Reach?

Hamill: We've been studying the fish habitat needs in the Fifteen Mile Reach for the last five years and came out with some full recommendations for the Fifteen Mile Reach a couple of years ago which were reviewed within the program, subsequently transferred to the Water Conservation Board and accepted by the board as the basis for appropriation and acquisition of water rights. Those recommendations called for a flow of between 700 and 1200 cfs in the Fifteen Mile Reach for the months of July, August, September and October. As far as I know, there's not a lot of disagreement over those recommendations. It was based on the fact that we have deficit flows in the Fifteen Mile Reach during those months that are typically between 200 and 500 cfs. So we realize that there was water that was available in Rudeye, and we requested the Bureau based on those technical needs.

Question: You mentioned the unused amount of water in Rudeye. If this water does go down into Fifteen Mile Reach, will those existing and proposed uses out at Rudeye Reservoir be protected?

Hamill: That's probably a question that should be addressed to the Bureau of Reclamation. They have an active water marketing program for water out at Rudeye Reservoir. Under the preferred alternative, under their EIS, they're trying to actively market 51,000 acre feet of water from Rudeye. So far I think they've marketed about 10,000 acre feet of that water, and they've had several requests for additional

water. And it was based on the fact that the Bureau has made the decision that they want to market 50,000. They've only used 10,000, so apparently there's water available. I don't mean that the water is going unused. I realize that the recreation users at Rudeye Reservoir are making good use of that water. But the fact is that the Bureau has what I guess they would term is surplus water at this time.

Kuhn: Let me just say that our understanding was that as long as the Bureau on an annual basis says that the water is not being used, for example, it's under contract but not scheduled in an existing year, the question then becomes, is it released from the reservoir in September or October, you know, for the benefit of the fish, or is it then released in December-January, as, in effect, a regulatory release? And our concern was so long as that water was not taking something away on the Frying Pan in the winter months, and so long as it's compatible with the other uses, if the Reclamation decides that they can schedule water that's under contract, but not schedule for releasing it in an existing year, then that's the kind of mechanism we'd like to see worked out, because it shows kind of flexibility and cooperation on all sides. That's our view.

Question: Tom, you talked about federal reservoir reoperation as an important water rights component under state law to protect the flows once they're back in the river. What's the status with Utah in particular below Flaming Gorge? Are they in the position, willing and committed, and is their state law sufficient to protect those flows in Utah on the Green River?

Pitts: Well, we looked at their state law, and Utah does have an in-stream flow law that could be used to protect those flows. They have a law that requires legislative approval to protect in-stream flows. And the other possibility is to do it by contract with water users and the two members we've identified. So far, we haven't used it in Utah, but they do have the mechanism there to effectively support in-stream flows.

Question: Does Utah seem to be a willing participant in that aspect of it?

Pitts: I think so. If they pass an in-stream flow law, we haven't really put that to the test in saying we want to protect these flows in the Flaming Gorge.

Managing Colorado's Water Resources for Multiple Purposes

Ken Salazar

Executive Director, Colorado Department of Natural Resources

On the governor's behalf I extend his greetings to all of you attending the conference. On my own behalf, I decided we would simply move the Department of Natural Resources to Gunnison for two days. After reviewing the agenda and seeing how many of my directors and staff within the department are here, I thought it would be more efficient for us to conduct our business here in Gunnison for a few days. In any event, on behalf of the department and its divisions and members of the Colorado Water Conservation Board, who are also meeting here today, we appreciate the opportunity to participate in this conference.

Water really is the lifeblood of Colorado. It brings life to the cities, towns, the farms, ranches, valleys, and forests. It fuels business and industry. It nurtures wildlife and vegetation; it attracts visitors and recreational users. In short, water is the common liquid thread holding all of Colorado's natural, social, and economic life together. The importance of water in Colorado has long been recognized.

Almost 150 years ago the lands which are now part of Colorado in the San Luis Valley were settled by the northward migration of Mexican and Spanish residents of northern New Mexico. Those settlers had settled in and around Santa Fe, New Mexico, since approximately 1598. For the next 250 years, the Spanish and Mexican settlers lived in the arid lands of northern New Mexico. They recognized the importance of water and developed a prior appropriation system that took water from the Rio Grande River and its tributaries to develop a vibrant agricultural economy that sustained the numerous settlements in New Mexico. Following the Mexican-America War and the signing of the Treaty of Guadalupe Hidalgo in 1848, Fort Garland was established in the northern San Luis Valley, and the American cavalry pushed the Indian tribes west across the San Juan Mountains. That opened up the San Luis Valley to the residents of northern New Mexico who came flocking to the valley's abundant lands and waters.

Between 1848 and 1854, at least ten of the oldest settlements in the state were founded in what are now Conejos, Castillo, and Rio Grande Counties. One of those settlements, San Luis, founded in 1851, is the oldest incorporated town in Colorado. The flocks of settlers that came to the San Luis Valley had a vision. They would divert and tame the waters from the Rio Grande and its tributaries the Conejos and the San Antonio. They called the Rio Grande the Rio Bravo del Norte or the Valiant River of the North. This water would then be used to transform the desert into farms and ranches. They would build a better life for themselves and their families.

The vision of those early settlers was shared by other settlers and farmers who came into Colorado through the remainder of the 19th century and the first half of the 20th century. The Germans who settled Weld County, the Italian, French, and Hispanic settlers of the Arkansas River Valley, and the numerous nationalities that settled the West Slope, all shared the same vision. Their vision was to take the water source from our rivers and establish a viable, vibrant agricultural economy. The lush,

green valleys of our state that meander along each of major rivers and their tributaries is testimony to the realization of their vision.

Today, irrigation accounts for approximately two-thirds of all the crops we produce in Colorado. In 1987, Colorado had a total of 3 million acres of irrigated agricultural land. Colorado's farms and ranches alone in 1987 provided 42,000 jobs and generated gross sales of \$3.2 billion. Moreover, the food and farm system accounted for sales of \$26.9 billion and 231,000 jobs, or 19.1% of the employment in Colorado.

Without agriculture, most of our rural communities would wither and many of them die. From Alamosa to Lamar, to Greeley to Grand Junction, those communities would not exist without the agricultural base that supports them. And indeed the Denver Metropolitan area and the larger communities in the state that rely on alternative industries would also suffer dramatically without the agricultural economy in Colorado. In summary, for those who are critical of the 90% resource that we consume in agriculture in the state, I would remind them of the importance of agriculture to our economy and to our heritage.

As we approach 150 years since the founding of San Luis we must also recognize some emerging new realities for how water is used. Those realities call for water to serve a multitude of sometimes incompatible purposes and interests. Those realities create a fierce competition in Colorado for how water is used. That competition will only get worse as population growth continues, as periodic droughts occur, and perhaps as effects of global climate change are felt in Colorado. As the decade unfolds, we will see ever increasing pressure for using water to meet other needs, especially recreation and wildlife. For example, we have no state parks in the entire southeastern part of our state defined as the area east of I-25 and south of I-70 outside of the Denver Metro area. The southeastern part of our state through our civic and elected leadership is vigorously pushing for a new park. They recognize that state parks and recreation areas can be a major tourism attraction, yet 30 of our 38 state parks have a water recreation focus and account for about 8 million visitors a year. Another example is a recreational use of the upper Arkansas River. That usage has increased by 50% since 1987. In 1990, the area had approximately 292,000 visitors that included almost 200,000 boaters. There can be no question that the infusion of millions of dollars into the communities around Salida allow those communities to have an alternative economic base for survival.

While we know the importance of water for recreation and its connection in our efforts to create a healthier rural Colorado through a diversified economy, we simply do not have enough water for those purposes. In 1988 the water level at Boyd Lake State Park dropped so low that the main boat ramp had to be closed. Today, John Martin Reservoir is being drained to the point where the boat ramp is located several miles away from the shore. John Martin Reservoir in a few weeks will be little more than a mud flat with only 3,000 acre feet in storage. The tremendous warm water fishery of John Martin Reservoir will be destroyed, and it will take four to five years and millions of dollars to restore that fishery. Many other off channel reservoirs on the Arkansas River which have provided tremendous fisheries for the residents of those communities and visitors are also drying out. Thus the efforts by the state and local

communities to create a new state park for southeastern Colorado have been thwarted by the lack of water needed to maintain fishing and other recreation.

These examples point to a stark reality: in the competition for water, there is simply not enough water for recreation. That reality hurts both our rural and urban economies, but it hurts our rural economies even more because those rural economies do not have the diversity of Colorado's urban economies. Beyond the competition between recreational and other traditional users, there is also intense competition among the recreational interests themselves. The Colorado Department of Natural Resources made a recommendation to support the rafting industry in the Arkansas River through enhanced flows between Leadville and Pueblo Reservoir. In so doing we have set up a bitter dispute between fishing and rafting. Rafters want the Arkansas River to have enhanced flows to maintain the national prominence of the rafting industry in the area. The fishing interests want the water to remain at a lower flow in order to maintain the nationally recognized fishery in the area.

The challenges to our water right system are not only these new and competing needs of water for wildlife and for recreation; our water right system in Colorado is threatened by external factors which are out of our control to a large degree. Some of those factors are the following: first, our neighboring states. The state of Colorado has spent nearly \$8 million fighting against claims by Kansas that we have overused our share of water under the Arkansas River Compact. The matter will continue to be in litigation for the next several years and culminate in the United States Supreme Court decision which will ultimately affect how we view the long term usage of the Arkansas River. On the South Platte, Colorado has stepped into the litigation between Wyoming and Nebraska in an attempt to make sure that our water from the South Platte system is not impacted through that litigation. And on the Colorado River, Colorado's unused entitlement of somewhere between a million and two million acre feet of water per year that flows across the state line continues to be consumed by the downstream states in the lower basin. Yet irrigated acreage on the West Slope which consumes most of our water has dropped from 961,000 acres in 1959 to 855,00 acres in 1987.

Soon after reapportionment, California will have more members in Congress than the 15 other Western states combined. For the first time, the lower basin states are in a position where they will begin to consume more than seven and a half million acre feet of water allocated to the lower basin states in the Colorado River Compact. On the near horizon, we can conceive of litigation or federal agency action that would result in the U.S. Supreme Court litigation between states of mammoth proportions. On the Rio Grande, New Mexico and Texas are making noises about suing the state of Colorado as they did in the 1960's especially if American Water Development Incorporated is allowed to take water from the San Luis Valley.

A second challenge to our system of water laws is the panoply of federal laws and regulations that have in many cases shattered our cherished right to appropriate the unappropriated waters of every stream. The Federal Endangered Species Act threatens to stop all water development in Western Colorado unless we can effectively implement a recovery of the endangered fish. The National Environmental Protection Act has been used effectively to kill Two Forks and stands in the way of any

proposed water development project. In addition, the Federal Wilderness Act, the Wild and Scenic Rivers Act, the Historic Preservation Act, the Federal Land Policy and Management Act, and the Clean Water Act are only a few of the other federal laws that hamper the right to divert water in this state.

The foreseeable future holds no promise for more federal money available for the major reclamation projects such as the Big Thompson, and the Frying Pan Arkansas Project. The coalition of interests behind those concerned about the ever-growing national deficit and environmental concerns means that there will be no additional dollars for major water diversion projects other than those already authorized for the next decade and perhaps beyond.

In the Denver Metropolitan Area, hundreds of jurisdictions scramble without a unified plan to secure the certainty of water that they need for their future growth. Some of those jurisdictions want only non-tributary ground water, mining the waters of the Denver Basin. Others, like Thornton, scramble to the north to bring water from agricultural lands to serve the northern communities. And others, like Arapahoe County, look to the Gunnison Basin. The disorganization of the Metropolitan Area in water matters causes private ventures like the American Water Development Inc. to look at the ground water in the San Luis Valley for profit. And the agricultural economies in places like the Arkansas Valley are irreparably hurt as the water from those areas is willingly sold by farmers for higher economic use in Front Range cities. Therefore, everyone should understand that when we talk about Denver Metropolitan water cooperation, it is in the interest of the whole state that we make progress on this agenda.

What are some of the things that we can do as a state and as a community of Coloradans to effectively meet those challenges? First, we must increase our vigilance on interstate water matters. In this regard we are vigorously opposing the state of Kansas in the Arkansas River litigation. In addition, a team of state officials including Jeris Danielson, David Walker, and Jim Lochhead are involved in extensive negotiations with the other Colorado River basin states concerning the future of the Colorado River. Our intent is simple: to protect Colorado's rights under the Colorado River Compact for future generations. The State Engineer of the Division of Water Resources will be reviewing and assessing threats to our entitlements in each of our interstate river systems and provide recommendations to me, the Water Conservation Board, and the governor, before the end of the year, on how to protect Colorado's rights under interstate compacts.

Secondly, we must focus our attention on water use efficiency and water conservation. We must do so because of limited supplies, rising price tags for new and expanded facilities, and environmental concerns. We must incorporate water conservation as a key element in the planning and management of water in Colorado. State involvement to guide more efficient use of water resources is appropriate. In this regard, the new water efficiency effort is well under way in Colorado's Water Efficiency Act of 1991, which authorizes the establishment of State Office of Water Conservation within the Colorado Water Conservation Board. The new office officially opened for business on July 1.

Key elements of the Water Efficiency Act of 1991 are it establishes the Office of Water Conservation within the Colorado Water Conservation Board, it authorizes \$500,000 from the Water Conservation Board construction fund for grants toward water efficiency demonstration projects. Any

public agency established under state law is eligible. It requires state agencies to develop water conservation plans for state projects and facilities constructed or renovated after 1993. It requires upgrading existing plumbing facilities for state facilities. It requires water conservation plans to be developed by water providers using more than 2,000 acre feet of water annually. In other words, communities generally with populations larger than approximately 8,000 will be required to comply with this provision of the law. The office is also charged with establishing and maintaining an information clearinghouse and providing technical assistance to agencies. These services alone will be a valuable asset to the state. The passage of House bill 1154 marks a milestone for Colorado. Few states have water conservation acts or bills that are as comprehensive. The Water Conservation Act of 1991 places our state in the forefront of national water conservation efforts.

Regarding water efficiency within agriculture, many efforts are underway throughout the state. The Soil Conservation Board, working with the Office of Energy Conservation, has instituted a major program to help farmers be more efficient in the use of their water. The Northern Colorado Water Conservancy District is pushing hard in water efficiency within its boundaries. And generally speaking, the agricultural community is recognizing that water conservation and water efficiency means less pumping costs, less leaching of very expensive fertilizers through soils, and higher yields.

Third, we must look at how we finance water initiatives in the state of Colorado. The Colorado Water Conservation Board has undertaken as one of its priorities to look at the future of the construction fund. Historically, the construction fund has been used as a mechanism to provide below-market capital financing for water projects. Two-thirds of the fund has been used for increasing the consumptive use of compact entitled waters, and one-third has been used for repair and rehabilitation. The Board, under the able leadership of Bob Jackson, will take a look at whether or not the formulas and purposes for which the fund was created are adequate.

A key piece of information to look at as we consider the future of the construction fund will be the storage that we will lose in Colorado because our dams and water infrastructure are not currently at a certifiable level with the State Engineer. The Dam Safety Branch at the State Engineer's Office estimates that the total storage lost because of restrictions on water storage throughout the seven water divisions of the state is approximately 162,000 acre feet.

A major issue that concerns the entire state of Colorado and impacts every single region of the state is the issue of metropolitan or Front Range water. The Denver Metropolitan Leadership Forum of Civic and Political Leaders recognized the importance of the Denver Metropolitan Area getting its act together on water. At the root of their concern is the need for the Denver Metropolitan Area to have certainty in terms of its future water supply. They recognize that some of the Metropolitan Area communities have a reliable supply forever, while others rely exclusively on mining of ground water. They also recognize that if the Denver Metropolitan Area gets together and shares information and institutes innovative management practices for water, the reliability of water supply for the Denver Metropolitan Area can be enhanced. For those in rural Colorado, the importance of the Metropolitan Cooperation cannot be understated. If the Denver Metropolitan Area could find that it has a certainty

for its future water supplies, then perhaps there would be no further dry-ups in the Arkansas River Valley, nor projects like American Water Development Inc. in the San Luis Valley.

Perhaps our greatest challenge as we approach the 150th anniversary of the usage of the prior appropriation doctrine of Colorado will be for us to use our creativity and develop inventive water management initiatives. Some of those water management initiatives could include interruptable water supply contracts, to preserve the agricultural economy and provide protection to the area of origin while at the same time allowing for the development of water supplies for other uses. For example, as we look at John Martin Reservoir becoming a mud flat, it may be possible to pursue arrangements with agriculture producers in the area. The state of Colorado, the Division of Wildlife and the Division of Parks might provide farmers a fee for the short and limited non-use of water for a limited acreage. The water so saved could be stored to address the fishery and other recreational needs in the area. No land would be permanently taken out of production, and thus one would assure the continued viability of the agricultural economy. No diminution in the valuation of lands would occur, thus no negative impact would result in public education or other public services. At the same time we might accomplish a diversity in that economy needed for our rural communities to survive.

In conclusion, we must find a way of turning our energies and our resources against the common enemies of our destiny. Too often we spend tens of millions of dollars fighting each other in the state on divisions that are rural and urban, agricultural and recreational, and environmental and developmental. We need to find a way to deploy our energies and resources against a common enemy instead of fighting within our own family of Coloradans. We should develop a common mantra which we repeat every day. "California, Nevada, California, Nevada," etc., etc. In the alternative we might use, "Federal laws and regulations, federal laws and regulations."

I understand that \$40 million has been spent on the AWDI water rights application in the San Luis Valley. That is enough money to build four potato processing facilities. That would provide several hundred jobs in the valley. With those jobs, perhaps the vision of our forefathers would be realized, that the valley could provide a livelihood for their children, so they would not have to leave the state for urban centers to survive.