Organizing for Endangered and Threatened Species Habitat in the Platte River Basin

by
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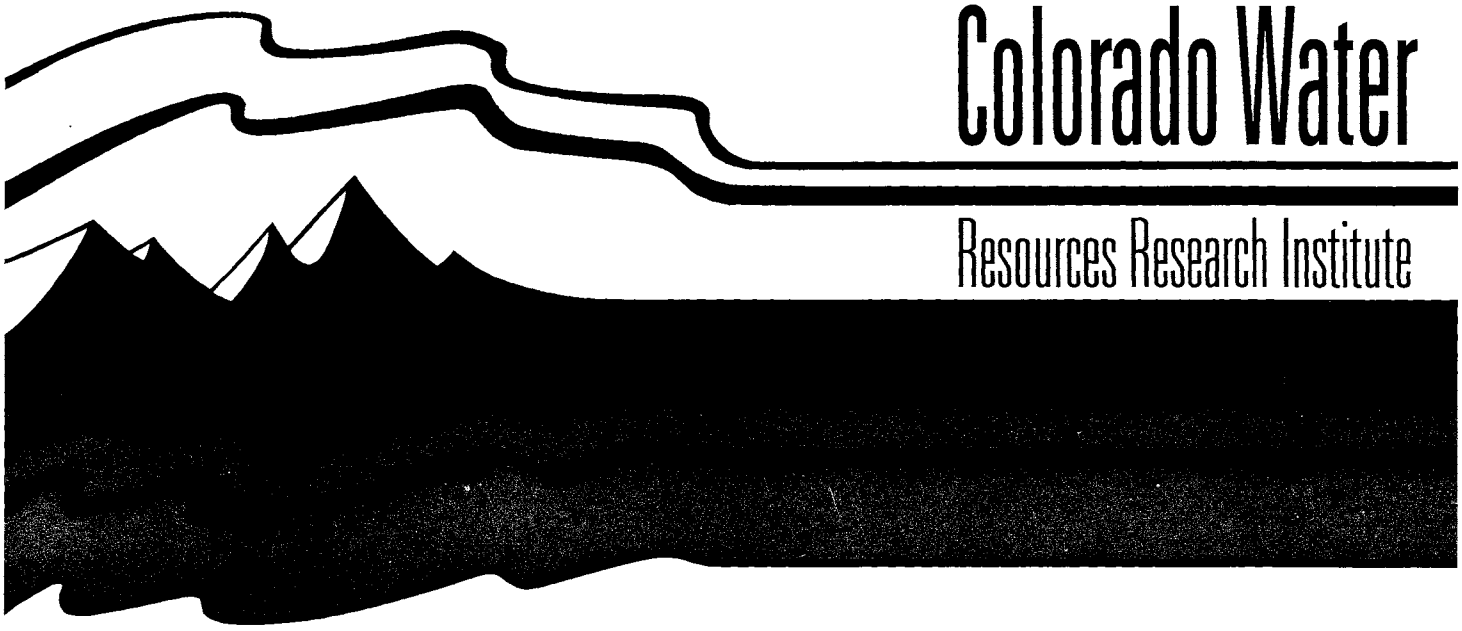
September 2003

Special Report No. 12



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ORGANIZING FOR ENDANGERED AND THREATENED SPECIES HABITAT IN THE PLATTE RIVER BASIN

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An Earlier Version Of This Report Was Presented To The
Colloquium On Comparative Study Of Ecosystem Restoration Projects
Center for Ecosystem Science and Policy
University of Miami School of Law
Coral Gables, Florida
January 22-24, 2003

Interim Special Report 12
Colorado Water Resources Research Institute

FOREWORD

Around the world, water users go into marketplaces and are promptly served, given sufficient capacity to pay, with desired agricultural implements, seeds, fertilizers, pesticides, herbicides and all those other necessary things that confer mutually direct benefit to buyer and seller. However, in no water culture, have people been able to order up, in those same private transactions, a unit of ditch water control, a "fair share" allocation of stream flow, a solution to the problem of conjunctively using well water with surface supplies among nearby neighbors and others more remote, or an increment of improved ecosystem diversity. Such things require coordinated action of social organizations beyond the capacity of marketplaces to provide. In the North American context such organizations are mutual companies, acequias, irrigation districts, conservancy districts, metropolitan water supply districts and government agencies.

In their historic struggles with each other and the arid high plains environment, people of the basin have evolved a rich organizational capacity to do things collectively that could not be accomplished via private exchange in marketplaces. They have organized to divert water into ditches, to share the "shrink" among parties on those same canals, and then employ their collectively owned and managed water systems as a foundation upon which to construct their communities. Then, to protect those communities from the depredations of the newcomer upstream, they had to organize to allocate scarce water among ditch headgates along extensive river systems. When surface water sources could no longer suffice, many people sought relief in use of groundwater; this, in turn at least in some places, compelled additional organization to integrate generally newer groundwater exploitation with older surface water uses. Now, all this organizational tradition is put to a newer test in the Platte River Basin. Can this tradition that grew up on a heavy dose of utilitarian water use largely blind to environmental consequence, a tradition forged around boundaries that divided the federal government from the states, the three basin states from each other, and user from user, environmentalist from environmentalist, undertake a successful basin-wide program of collective cooperative action for integrating within the water management agenda habitat needs of three bird species and one fish listed under the terms of the Endangered Species Act?

This report addresses only a late portion of the larger story, that part having to do with the genesis and progress of basin-wide discussions that were sporadically launched in the 1970's and early 1980's, that came into intensified focus in the 1990's, and that–it is hoped by the participants–will be successfully brought to fruition by early 2005. These discussions have had, as their central focus, the construction of a cooperative basin-wide recovery program for designated critical habitat on Nebraska's central Platte for the whooping crane, piping plover, interior least tern, and–on the lower end of the river–the pallid sturgeon. This work constitutes an interim report in two senses. First, it represents a draft that will be revised. Finally, since the story of getting to a viable program has yet to fully unfold, a future edition will track the negotiations to their conclusion. Meanwhile, reader comments are invited.

ACKNOWLEDGMENTS

This study is an attempt to capture the essential shape of multiple sets of negotiations that have been on-going for more than a dozen years in the Platte River basin. It has been an ambitious set of talks between local water users and environmentalists, between rival water users within and among states, between water users and state authorities, states and the federal Department of Interior. The research intent has been to be attentive to positions and processes, the exertions of leaders and their organizations as they have collectively approached the creation of something new under the sun–a set of agreements that will re-regulate Platte River basin water flows, and provide improved river and terrestrial habitat for threatened and endangered species.

This project has been made possible by the assistance and good will of many people who have lived and breathed Platte basin water and environmental issues. These citizens have helped me understand issues, problems, and perspectives in public forums, small groups, private homes, committee meetings, lunches, dinners, offices, on the banks of ditches and rivers, in farm yards, and parking lots. They have toured me, fed me, and patiently educated me. They have represented federal and state policy and management positions, irrigation districts, mutual companies, natural resource districts, conservancy districts, power districts, municipalities, environmental organizations, and private agricultural enterprises. Some have shared their reactions to an earlier draft; their assistance has much improved the presentation and I am deeply appreciative of their efforts.

The tale of the Platte River Basin Recovery Program may well yet unfold over the course of lifetimes yet to be lived. However, the more limited story of getting the recovery program established has yet to fully play out. As this is written, negotiators are wrestling with issues that, as is so often the case in human affairs, have been postponed for the very reason that they have posed special challenges. Therefore, at this sensitive moment in the process, I refrain from listing my substantial number of benefactors. Lists for any particular state or federal agency, user group, or environmental community might give rise to speculations that, however accurate or wrongheaded, could serve no constructive purpose. When negotiations have birthed a program (or not) these people will be more properly acknowledged. My appreciation of their assistance is no less than if I spelled out their names here.

I can only hope that if, and when, they see this work in print they will find it to be of interest, to be balanced and fair to the contending perspectives. I do hope that, with their help, I have got the story straight and that they will find their efforts on my behalf to have been at least somewhat rewarded. I make my best formulations and hold ready for justifiable amendment. Any errors of fact or interpretation are solely my own.

David M. Freeman
September, 2003

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PART I INTRODUCTION

CHAPTER ONE: PROBLEM AND SIGNIFICANCE

Brought to the negotiating table by the requirements of the Endangered Species Act, representatives of the Department of Interior and three states–Colorado, Nebraska, and Wyoming–have been negotiating the terms and conditions under which they will collaboratively organize to re-regulate about 11% of the average annual surface flow of the Platte River (as measured near Grand Island, Nebraska) in conjunction with restoring 10,000 acres of critical habitat for whooping cranes, piping plovers, and least terns during the first 13 year cooperative program increment. In addition, they are prepared to test the hypothesis that the basin-wide recovery program will demonstrably serve needs of pallid sturgeon, although efforts on behalf of the fish will not be addressed here due to limits of space and the fact that, at this writing, there are substantial unknowns that make the pallid sturgeon story best left for another moment. Most parties hope that recovery program negotiations are now in their late stages but, at the very earliest, any agreement will not be ready for signing until late 2004 or early 2005. Although story told here ends in late 2002, the major negotiating themes and challenges were by then well established. A more complete tale must await a subsequent edition.

Questions

Two sets of questions are paramount. First, there are descriptive questions to be addressed. What is the ecosystem issue? How have water users, environmentalists, state and federal authorities found themselves locked into a prolonged discussion focusing on how to mitigate the problem? What are the agendas of the participants? What are their options and how do they exert themselves in problem-solving? How does science play a role? The second question set is analytical and will be examined at the beginning and end of this essay. Why do perfectly rational resource appropriators neglect environmental matters in the first place? What does it take to mobilize them to undertake concerted and collaborative action to preserve available remnants of high quality habitat and restore degraded segments? Case studies can never provide adequate testing of hypotheses, but they can generate propositions worthy of further consideration.

The descriptive questions will be addressed part by part, chapter by chapter. Analytical questions require brief explanation.

Analytical Perspective

Why will rational resource users degrade environments? What can be done to mobilize these same users to stop and then reverse environmental degradation? A tradition of inquiry in the social sciences has emerged over the last three decades that has closely examined problems of natural resource degradation, requisites of effective mobilization to reverse matters, and attributes of the most effective long-enduring resource management organizations (Bromley

1992);(Baden and Noonan 1998);(Freeman 1989);(Freeman 2000); (McCay and Acheson 1987); (Ostrom 1994);(Young 1982). The essence of the matter is that rationality is not a single thing. That thought is hardly a new insight. What is rational for the individual may well not be rational for the community of individuals. The reverse is also true. What is rational for society may not be in the rational self-interest of the individual. Rationality also turns out to have different meanings and requirements depending upon the kind of property/resource we are talking about.

To clarify the problem, it is helpful to distinguish three kinds of resources and reflect briefly on how rationality is affected by each. (See Figure 1) Property types each produce streams of benefits, but the nature of the benefit streams varies importantly on two conceptual dimensions--rivalness and excludability:

1. Rivalness is determined by whether or not use of the benefit by one user denies that benefit to other potential users. If one investor pays for production of the benefit and consumes what s/he can, will that same benefit be available for others who did not invest in providing it? If not, the property is said to be highly rival, such is the case with investing in a slice of pizza. If one eats the piece, it is not available to another. However, some kinds of property–e.g. high quality whooping crane habitat–is non-rival. One person enjoying the knowledge that whoopers have a good place on the central Platte for their spring staging and fall return stopovers, does not interfere with another's. Here, rivalness would be zero.

2. Excludability is determined by whether or not it is easy to exclude the non-investor (free rider) from benefitting from the investment. If one invests in a resource/property, can non-investors easily be excluded from sharing in the benefits produced? If so, excludability is said to be high as would be the case with a piece of pizza. If, on the other hand, an investor invests in improved piping plover habitat in central Nebraska, there can be no exclusion of whatever benefits are produced. Non-investors reap as much of the benefit as those who have sacrificed to provide the improved habitat. Excludability, in such an instance, is zero.

Employing these two analytical dimensions, it is now possible to define three kinds of property/resources and highlight their implications for rational action and willingness to sacrifice for provision of high quality wildlife habitat on the central Platte or anywhere else:

1. Private property/resources (See Figure 1) are characterized by both high rivalness and excludability. In matters involving private goods, investors can capture fully whatever benefit stream the property produces and they can deny non-investors opportunity to take a "free-ride" on their investment.. Farmers who buy improved seed varieties capture the benefit of higher yields. Purchasers of private groundwater wells capture the benefits of irrigation water for their cornfields and can exclude neighbors from diverting a fraction. A given quantity of water actually put to consumptive use on a farmer's crop is a private good. Pizza buyers literally internalize the benefit of their investments. Individual rationality, therefore, works well in free markets to produce and distribute private goods. People simply employ their individual

rationality to trade away the things that they do not want in order to obtain things they do. There is no need to get organized with a whole community to buy and use a pocket comb or a tractor.

2. Collective (public) property/resources (See Figure 1) have exactly the opposite attributes as compared to private property/resources. They are characterized by zero rivalness and excludability. A given quantity of water flow contributing to quality plover habitat is a public property resource. Markets do not emerge to provide these because the benefits that can be captured by an individual investor can be no greater than those available to non-investors (free riders). Healthy ecosystems capable of sustaining species listed under the Endangered Species Act, in the absence of public policy and effective organizations to prevent private rationality from dominating the situation, will be degraded by people who in the course of pursuing private rationality in marketplaces simply exploit open access to the common heritage for private gain. In an open access situation, one has to be a fool or major altruist to invest in things the benefits of which will escape away and cannot be denied to non-investors. Examples of collective or public include national defense, flood control, police and fire protection, forest and watershed protection and, of course, provision of high quality habitat for birds and fish on the central Platte river.

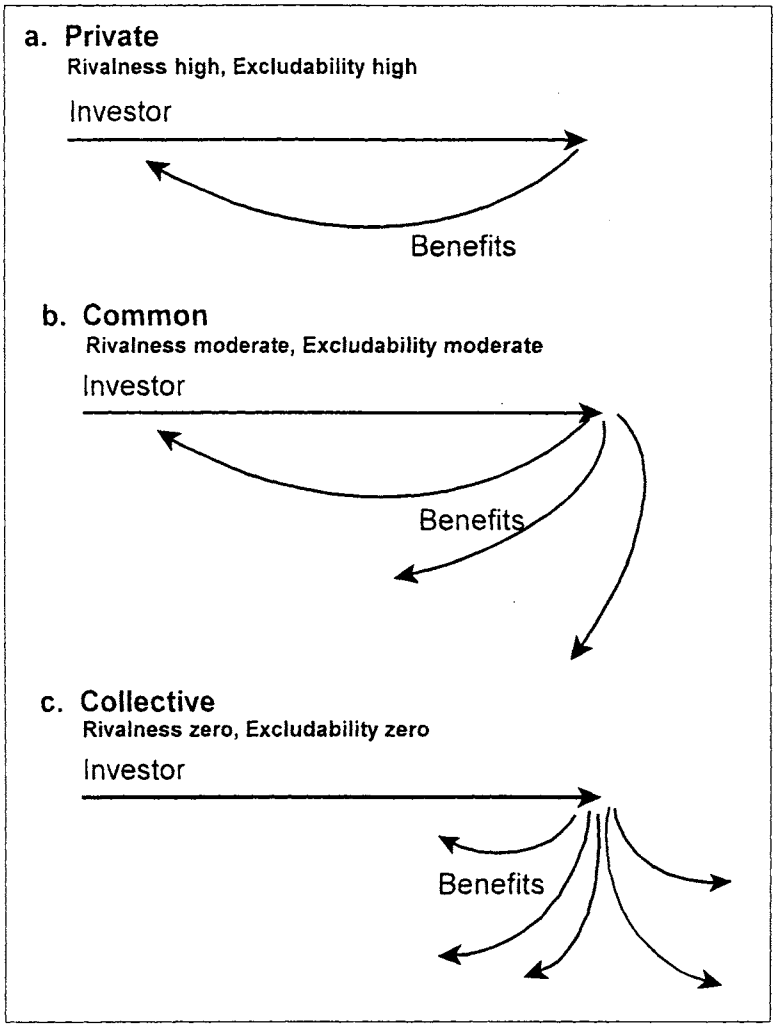

Figure 1 Types of Property

3. Common property (See Figure 1) is characterized by moderate rivalness and excludability. For example, a given quantity of water flowing though an irrigation canal to a farmer's field represents a resource that is moderately rival and excludable. It is rival in the sense that a delivery to one farmer cannot then be simultaneously delivered to the next irrigator. However, an important fraction of the water delivered to the first user will run off as tail water or percolate into soils and otherwise move downslope to provide "return flows" to other users who thereby also share benefits. Given leaky earthen ditches and modest field application efficiencies, a substantial fraction of one user's water will flow to others in the irrigation community and the others cannot be totally

excluded at reasonable cost. Since many are benefiting from the investments of others in highly interdependent flow networks, there is no particular interest in even attempting to exclude the non-payers.

It is now possible to see the genesis of environmental degradation and, in principle, a path to solution. Rationality in pursuit of private goods, undisciplined by higher-order community rationality enforced by organizational regulation, will generate a perverse logic that results in the destruction of collective property (e.g., environmental quality).

If the consequences of private actions for individuals or firms place a burden on the environment external to the private goods exchange–e.g., toxic flows of waste products, channelization of rivers, destruction of wetlands–there will be no constructive joint action of the players to rectify matters. If player X should invest in an altruistic act of environmental rehabilitation on a small fraction of damaged stream side, where no one else can be expected to join in, player X alone can do little to reverse river degradation caused by hundreds, thousands, or tens of thousands of players. Player X simply finds the individual investment to be a futile sacrifice. If, on the other hand, if all hundreds or thousands of players would somehow altruistically collaborate in reversing the environmental degradation, nobody would miss the absence of player X's contribution. Therefore, either way, the rational individual with open access to the resource, and no regulation from an effective encompassing organization--will refrain from investing in environmental remedy and simply be a free rider. Because everybody calculates in a similar manner, the public/collective property is allowed to deteriorate. This will hold even if there is perfect knowledge of the problem and of the solutions. What is rational for the individual in such situations is not rational for the community that would benefit from increased environmental quality.

Obviously, there is a solution that human beings in many societies have known for thousands of years. Get organized so that any one investor can be assured that all others will make coordinated and proportionate effort. The organized work of all resource appropriators can produce and sustain collective property. Under certain social and political conditions resource users have not allowed other users to simply exploit open access to environmental resources, to capture private benefits at the expense of their common future. If actor X is a member of an organized community where it is clear that all members will refrain from certain exploitations, and all members will sacrifice proportionately so that one does not gain undue advantages over another, and all contribute to sharing costs of maintaining the common or public property, actor X can make investments in collective property knowing that there is an organization in place that will prevent "free-riders" from undoing what organized restraint in resource use has gained.

The solution to the common property resource problem, and especially the pure collective property problem is, therefore, social organization; organization that controls access, insures sharing of benefits and costs, and controls potential "free riders."

The Platte River Recovery Program negotiations are of interest precisely because they promise to build an organized set of collective arrangements that will permit water users and environmentalists in three states and the federal government to transcend their more limited

traditional organizational agendas to work together at the river basin level to produce a new form of collective/public property–quality habitat for threatened and endangered species.

Analytically, then, the question becomes: how has it happened that a constellation of water user organizations that have emerged over the last 130 years to provide a combination of private benefits (e.g. agriculture/industries), and common property resource benefits (e.g., ditch companies, irrigation districts, conservancy districts, municipal water suppliers), and small scale collective goods (e.g., environmental organizations working on modest ecosystem patches), have entered into negotiations with a view toward producing on a larger scale than ever before a collective good/property in the form of species habitat?

To produce this new and expanded form of collective property, the players have had to agree to transcend and adapt their particular private and common property resource rationalities. They have proposed to invest in creative solutions of their own making to produce a product from which they will not capture any more benefit than anybody else in the basin, the nation, the world. Like others, they know not the value of a plover, a tern, or a whooping crane. Whatever that value, it is not to be measured in market exchange of private goods. They do know that there is no profit in sustaining these umbrella species, and all the life forms that will flourish with them. They know that to enhance the environment, their customers and members will pay a bit more for an acre foot of water and a kilowatt hour of electricity. They know that they would not have undertaken to produce this collective good if left alone. They also know that they have been capable of negotiating a new regime of things that will–more than has been the case in the past–come reflect the true costs that our production and consumption of private goods has placed on the river and other living things that depend on it. They would have to adjust their former organizational rationalities to make room on the rivers of the basin for a new collective agenda. All in all, the attempt to establish a basin-wide multiple state, state-federal cooperative species habitat recovery program is an astounding development–undertaken by virtually no other society--and one well worth investigation.

CHAPTER TWO:
CHANGE ON THE RIVER AND THREAT TO SPECIES

> "While I know the standard claim is the Yosemite, Niagara Falls, the Upper Yellowstone and the like, offered the greatest natural shows, I am not so sure but the prairies and plains, while less stunning at first light, last longer, fill the esthetic sense fuller, precede all the rest, and make North America's characteristic landscape"
>
> (Whitman 1982, p. 864)

The waters of the Platte River Basin are some of the most intensively exploited on the planet. By the time the South Platte River meets the North to form the main stem, both tributaries have been harnessed repeatedly to the utilitarian needs of industrial agriculture, urban life, and recreation, a pattern sustained across Nebraska. Hydrologists estimate that in some stretches the waters are used an average of eight times as diverted water returns to the river for re-use by agriculture, urban treatment plants, groundwater use and re-charge (Ring 1999). People and other living things are fundamentally dependent upon multiple re-uses of repeated return flows. Agriculturally, these streams supply surface water and groundwater irrigation to over two million acres of land in the three states. Human engineering of Platte basin waters for these multiple uses has exacted a high toll on the river and associated riparian ecosystems.

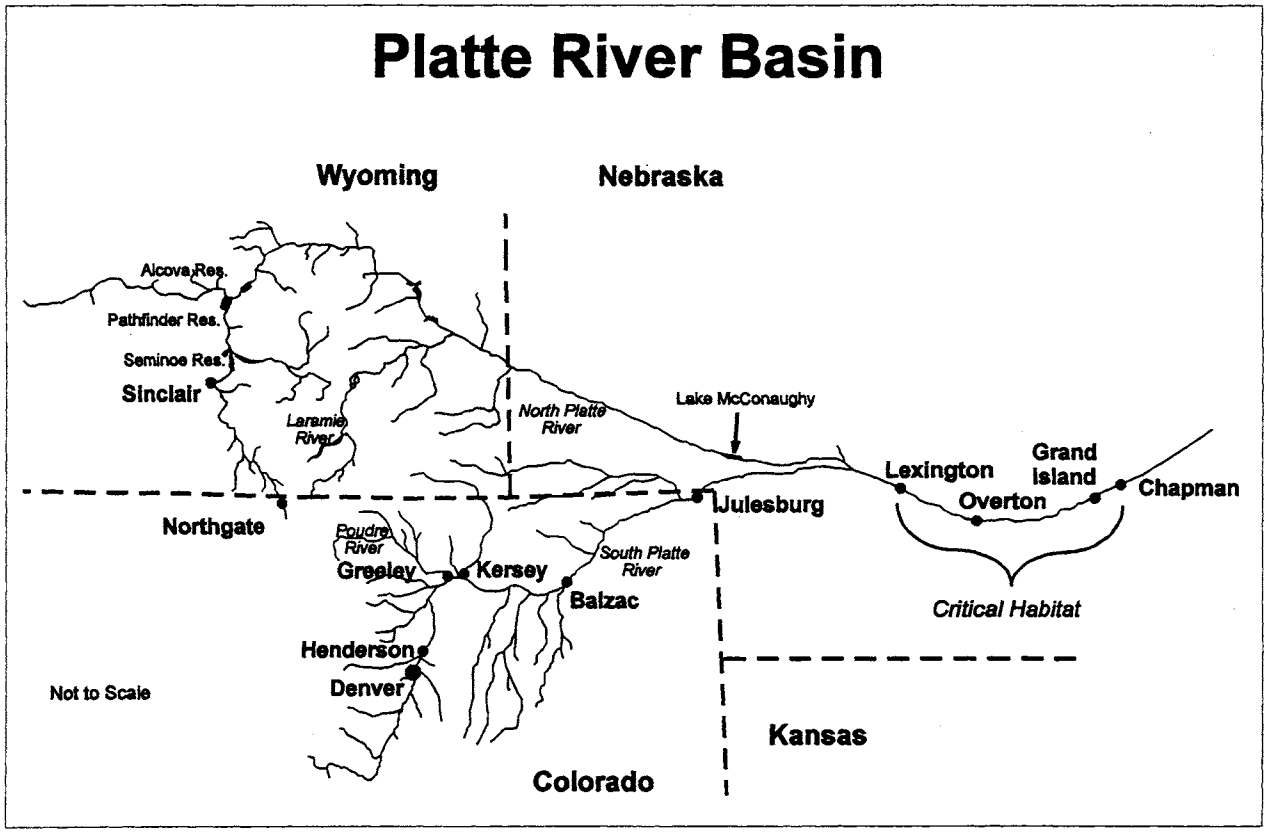

Figure 2 The Platte River Basin

The Traditional River

Platte

"Platte" is the French word for flat–an honest translation by French explorers of "nebraska", the Omaha Indian name for the broad shallow braided river (Matter 1969, p. 6). The North Fork of the Platte is 618 miles long, while the South Fork extends 424 miles before the two combine just east of North Platte, Nebraska to form the 310-mile main stem. Measured by volume at the mouth, the Platte River delivers an average of 5,980 cubic feet per second (cfs) to the Missouri, a pittance compared to rivers such as the Ohio (281,000 cfs), or the Missouri (76,200). Approximately 90,000 square miles in Colorado, Wyoming, and Nebraska contribute surface runoff and groundwater to the Platte River, yielding an average annual flow of 5,051,000 acre feet to the Missouri (Platte River EIS Team 2000).

Near the continental divide Colorado and Wyoming mountain snowpack thaws into rivulets gathering into plunging streams that flow through rough canyons and then abruptly run out on flat prairie where water settles into wide beds, which, well before the Nebraska borders, drop only at an average rate of 7 feet per mile (Ring 1999, p.13). Plains channels are typically broad, braided, and sandy, with low banks, sparse woody vegetation and high sediment loads (Wohl, McConnell, Skinner, and Stenzel 1998); (Eschner, Hadley, and Cromley 1981). Average annual rainfall slowly increases as one travels from west to east, from about 12 inches to 20 at the 98th meridian two thirds across Nebraska. Aridity dictated a river bounded by a short-grass plains landscape of buffalo and blue grama grasses.

Prior to European settlement, the natural flow pattern consisted of a spring rise (beginning in March), extending to a peak in late May or June, and then a sharp decline in late June into summer, fall, and winter months. Spring and early summer floods cleared vegetation from sandbars, islands, and river banks, and distributed sediment across a wide path. In the view of most analysts, channels had only small and infrequently distributed clumps of green ash, plains cottonwood, box-elder, and willows growing along the banks. A mile wide in some places, the river was described as a burlesque of rivers, braided with islands, studded with sandbars. Early travelers complained that the Platte could not be ferried for lack of water, and could not be bridged for lack of timber (Matter 1969: 239). When Fremont descended the North Platte in early September 1845, he attempted to float a bull boat with a draft of four inches and, after dragging it on the sands for three to four miles, abandoned the boat entirely (Simons and Associates Inc. 2000).

There has been vigorous debate among analysts as to the extent of the riparian forest in the pre-European settlement Platte river. The dominant view has been that the pre-settlement Platte was mostly an open non-wooded prairie river dominated by sandbars and non-arboreal vegetation (Currier, Lingle, and Walker 1985) (Currier 2000). However, using historical accounts of the river and early settlers and early General Land Office Survey information, that mostly treeless view of the Platte has been challenged (Johnson 1994; Johnson 2000). This view has pictured the traditional Platte as a river with an abundance of trees and riverine forest that was cleared during exploration and early settlement. The "openness" reported by observers of

the late 19th and early 20th century was, in this view, an artifact of human deforestation, not natural processes. The debate has important implications for envisioning river restoration targets, but definitive conclusions have been impossible to draw because the debate has not been about whether there were trees or not–all have agreed there were at least some–but about the extent and patterning of the riparian woodlands. The explorer-settler observations available in the record are simply not sufficiently quantitative to settle the argument.

Characteristics and Value of Ecosystem Services

Rivers in open flat country typically support more complex ecological communities than smaller woodland streams. More sunlight, more algae and zooplankton provide a broader base for the food chain. In addition, rivers with small gradients meander, demonstrating a dynamic equilibrium between erosion and deposition of sediment. Faster moving water scours out earth from the outside curves of channels and deposits this load when the velocity slows at inside curves. Stretches of maximum velocity and the deepest part of a channel lie close to the outer side of each bend and then cross over near the inflection between the banks, resulting in zones of erosion and deposition (Outwater 1996, p. 57-8). River backwaters, oxbows and chutes in a meandering pattern were important to breeding, feeding and resting habitat for resident and migrating waterfowl such as sandhill and whooping cranes, ducks, geese, and a variety of shore birds including the least tern and piping plover. Flood pulses re-worked stream channels by clearing out woody vegetation and flushing out silt.

Most aquatic productivity has occurred in floodplains rather than in the main channel (Outwater 1996) The transitional zone between river channel and prairie grasslands acted as a buffer from the extremes of flowing water and arid uplands. Successive plant/animal communities occupied meander loops as they were slowly transformed from aquatic channels to isolated oxbows and finally to wet flood plain depressions. As long as the river system kept creating new loops and cutoffs a succession of habitats suited to each type of ecological community was maintained–i.e. the larger river and floodplain sustained all stages of the process and did therefore support a rich diversity of life.

Habitat Change

The Platte river basin has been impacted by 15 major dams and reservoirs that are supplemented by many smaller water diversion and storage projects. There are 106 storage facilities on the South Platte alone holding an average of 2.8 million acre-feet of water (Eisel and Aiken 1997). Upstream from Lake McConaughy on the North Platte River, there are 84 storage works with a capacity of 4.3 million acre-feet. The total basin storage capacity is about 6 times the average annual flow of the Platte at Grand Island. Dams and reservoirs in the Platte River Basin provide a total storage capacity of over 7.1 million acre feet, with the Bureau of Reclamation projects accounting for 2.8 million acre feet (Keyes 2002). Traditionally river diversions were primarily for agricultural use, but higher value-added uses in the urban, industrial, and post-industrial high technology and recreational sectors have pulled water out of agriculture at a rapid rate.

All of the hardware that social organizations have put in place in the Platte basin has produced the wealth that rides with extensive irrigated agriculture, hydroelectric power, urban and industrial development, wetlands and wildlife for species benefitting from dense riparian vegetation, increased late summer, fall, and winter season base flows, recreational boating and other water sports that are served by reservoirs, and outstanding cold water fishing below dams. On the cost side of the ledger, however, the Platte in many places has become a stream of narrowed channels intersected by densely vegetated islands and flood plains, destruction of oxbows and meanders and associated natural wetlands, fish migrations blocked by dams, growth of woody vegetation no longer swept away at the seedling stage by naturally occurring flood pulses, and highly variable temperature fluctuations as cold lake bottom waters are periodically released. In general, the traditional flow regime has been changed to one characterized by lower and less frequent spring flood pulses, clearer water flows as sediment was trapped behind dams, more incised straighter channels, and higher mid-to-late summer, fall, and winter flows.

Habitat Requirements of Whooping Cranes, Piping Plovers, and Least Terns

> "We are not trying to turn the river back to its pre-European historical condition. That is impossible. We are trying to maintain pockets of serviceable habitat."
>
> United States Fish and Wildlife Service

What a bird requires of its environment is in limited supply--food, shelter, and nesting sites. Birds of the same and similar species make similar demands on the habitat—the more individuals in a given territory, the less supply for any given request. Therefore, many birds are territorial and compete amongst each other for scarce resources. What, therefore, is needed for preservation and protection of the several species are larger quantities of habitat to support the numbers of species competing for the resources available. As human impact has destroyed the wide shallow braided Platte in most reaches, the story of the whooping cranes, their cousins the sandhill cranes, least terns and piping plovers is one of being crowded into ever smaller reaches of viable habitat along with millions of other migrating birds who press into the same area.

Whooping cranes, *Grus americana*, are among the largest birds in the world–standing over five feet tall, with a wingspan of 7.5 feet, they weigh on average 14 pounds and frequently fly 200 to 500 miles per day during migration. They lay two eggs a year in the far north, and live as long as 40 years. Brilliant white birds, with black wingtips and bare red head tops, whooping cranes share the central Platte river habitat of the sandhill crane, a smaller, gray, more numerous cousin. Whooping cranes, one of the most celebrated of endangered species, is a loner--much less gregarious than its prolific relative, the sandhill. Whooping cranes have a convoluted windpipe as much as five feet long, that can produce loud and resonant calls while flying. Audubon asserted that he could hear whoopers at a distance of three miles (Forbush and May 1955). Flocks of sandhills joined by a few whoopers visit the Platte River in February-April and October as they move from wintering grounds on the Texas gulf to breeding areas in Northern Canada and then make their autumn return. The fossil record places sandhill cranes in Nebraska more than nine million years ago, long before there was a Platte River which, by comparison, is only about 10,000 years old. Well drawn descriptions of whooping and sandhill cranes are

readily available (Matthiessen 2001; Walkinshaw 1973). Whooping cranes have come to symbolize a variety of things in different cultures around the world: conservation, royal beauty, and wilderness. They now have become the major symbol of a proposed reorganization of water in the three states of the Platte river basin.

The population of whooping cranes, prior to European settlement of North America, has been estimated to have been about 15, 000 (Matthiessen 2001,p. 274). They once ranged along the Atlantic seaboard as did the sandhill. However, as Europeans settlement increased, their numbers decreased. Very edible and of great size, whooping cranes were decimated by rifles and shotguns of the settler-hunter. In 1860, the whooping crane population was estimated by some to be in the range of 1,300 to 1,400 birds, while others estimated as few as 500 - 700 individuals (Allen 1952). During the nineteenth century the whooper retreated to west of the Mississippi, and by 1880 was a rare bird everywhere. A non-migratory population in south-west Louisiana fell to disease in 1940, and soon became extinct. By 1941 the number of individuals in the recorded migrating wild population had declined to 16 with only 6 to 8 breeding birds (U.S. Fish & Wildlife Service 1997a).

The whooping crane population has rebounded a bit because of habitat acquisition, federal protection, and intense management of breeding and wintering areas. By 1987, 136 birds were in the wild, and populations fluctuated around that number until 1995 when a peak wintering population of 158 birds was recorded (U.S. Fish & Wildlife Service 1997a). In 1998 about 200 whooping cranes made up the North American mid-continent flock, out of 400 worldwide many of which are in captivity. Whooping Cranes remain the rarest of the world's 15 crane species.

The Big Bend stretch of the Platte river in central Nebraska has presented an extremely favorable combination of habitat types, hosting bald eagles, peregrine falcons, over 10 million ducks and geese, eskimo curlew, and for a brief period in each spring over a half million sandhill cranes along with their rare cousins, the few whooping cranes. The area between Lexington and Chapman is witness to over eighty percent of the world's sandhill cranes spending 4 to 6 weeks in spring, resting dancing and feeding before continuing the migration north. As they rise from their shallow river channel habitat at daybreak and return at sunset, the almost one half million sandhill cranes put on one of the great natural wildlife shows on the planet.

Figure 3 Crane Migration Flyway

Although whooping cranes do not breed on the Platte, they, along with over 300 other species of migrating birds use the Platte seasonally, of which 125 nest along its banks (Grooms 1991: 20). The entire natural flock of whooping cranes are believed to migrate through Nebraska between the wintering grounds at Aransas National Wildlife Refuge

and their summer nesting grounds in Wood Buffalo National Park, Canada (Currier, Lingle, and Walker 1985, p. 22). This central Nebraska patch has been called the waist of a habitat hourglass; millions of birds depend on the few resources available. Weeks later the several migrating species spread out over wide ranging sparsely populated northern breeding grounds. But, in the narrow stretch of central Platte, the many migrating species including the sandhills and the few whoopers become concentrated in the late February-April period in a manner that occurs at no other time (Grooms 1991: 116).

In early spring along the Gulf Coast, Southwest and northern Mexico, sandhill cranes begin calling and gathering together for the annual migration north (Figure 3). Whoopers fly in pairs and singly. Both sandhill and whooping cranes fly in daylight, relying on thermal updrafts to improve efficiency and minimize energy expenditures. Riding an updraft and then gliding northward, they steadily lose altitude until the next thermal lifts them and they repeat the process. Often flying a mile above the earth, they can soar to 20,000 feet above sea level. They arrive at a staging area along the Platte river by late February and early March, descending from cold wintry skies into sandhill country, with rolling hills and marshes, oxbows and shallow lakes, close to brown harvested cornfields. Wide expanses of shallow water offer protection from predators that have to make long running splashing attacks.

Stopping along the Platte to replenish reserves and add fat, whooping cranes tend to arrive a bit later, and use the area less extensively, than the sandhills who begin to arrive in late February and depart by mid-April for the last push, following the spring thaw north to summer breeding grounds. Arriving in the sub- and arctic region, especially just south of the Great Slave Lake of the Canadian Northwest Territory in Northern Alberta's Wood Buffalo National Park, whooping cranes build a platform nest of rushes, and raise one or two young each year. Whooping cranes mate for life, and vigorously defend their territories in both summer and wintering grounds (Allen, 1969). There is seldom a break in the fierce alertness in resisting intrusion of any other whooping crane pair. Most whoopers leave their northern breeding grounds by the end of September but often do not arrive at their gulf coast wintering grounds until December. Pairs with newly-fledged juveniles typically are the last to return. They also display much solidarity in the simple family unit–protecting and nurturing fledglings until the young's first spring, at which time the adolescent birds are driven from the family group with jabs and lunges before the mating pairs lift off again for the long migration north leaving the newly independent yearlings to migrate singly in their wake.

The central Platte in the Big Bend area of Nebraska is made up of alluvial bottom lands, river terraces, and gently rolling bluffs along the river escarpment. Bottom lands are flat and extend for up to 15 miles on both sides of the river channel. Rich prairie soils support a productive agriculture. Each year, this area provides for the needs of millions of migratory birds–cranes, ducks, and geese. The few whooping cranes, and almost a half million sandhills, make good use of harvested corn and alfalfa fields, grassland, and unvegetated river sandbars. They feed on cropland grain, obtain invertebrate (e.g. snails and earthworms) food from alfalfa fields and wetland-grasslands. Wet meadows provide both food and areas for courtship rituals. Both whoopers and sandhills come to the central Platte because it is the only locale in mid-continent that meets all their requirements (Currier, Lingle, and Walker 1985: 7):

1. shallow water–preferably on submerged sandbars surrounded by deeper water. These areas must be surrounded by wide open spaces around the roost– a radius of at least 250 yards;

2. sandhills put on fat–20 to 25 % of their body weight must be put on while on the Platte, both for the journey north and for surviving early days after arrival in the arctic when food is still scarce; whoopers tend not to stay in the central Platte sufficiently long to put on such high proportions of fat;

3. they need wet meadow complexes adjacent to the Platte–these serve as a source of protein and minerals needed to trigger breeding processes.

Much of the traditional wet meadow area upon which both species of cranes depend has been lost to irrigation and river channelization. Yet, by early March in a typical year almost one half million sandhill cranes will be packed into 60 miles of river along the central Platte, taking refuge on sandbars in shallow water.

A major impact of upstream water capture and use has been a reduction of channel width and channel area (Figure 4). According to land survey maps, channel widths in 1965 were 21 to 73 percent of the 1865 widths recorded. Because of controlled releases from reservoirs upstream, there is less variability in over-all river flows than there were historically. The Pathfinder Reservoir, completed in 1909, was the first major impoundment on the North Platte, followed by Guernsey (completed in 1927), Alcova (1938), Seminoe (1939), McConaughy (1941) and Glendo (1957). These reservoirs dropped annual average peak flows on the North Platte by 86% (Currier, Lingle, and Walker 1985: 96). This change has resulted in a net loss of water-filled channel and an associated increase in vegetated river-banks. This, in turn, has meant loss of roosting, nesting and feeding habitat that comes with loss of meanders and grasslands-wetlands near the main river channel.

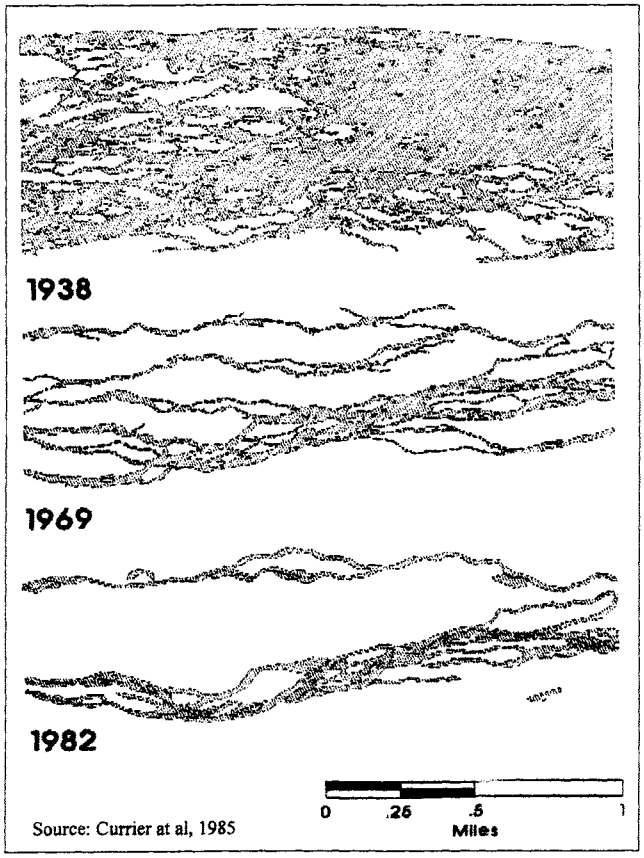

Figure 4 Increased Channelization of the Platte

Reduction of available habitat for all the species of birds that traditionally made use of the Platte basin creates two forms of hardship: 1) competition for the limited food supply; and 2) crowded conditions exacerbates disease transmission. Avian cholera and

tuberculosis brought in by snow geese poses a threat to the health of many birds and most particularly both species of cranes. Crowding contributes to disease transmission. As wetlands have been drained and woodlands grown up along the banks, quality crane habitat has shrunk to less than 70 river miles in the Kearney--Grand Island area. Here cranes and other birds crowd dangerously close in the few good habitat reaches that remain (Currier, Lingle, and Walker 1985: 18).

Caloric requirements for migration used to be met by starchy tubers from a variety of aquatic plants, worms, snails, snail shells and insects in the floodplain. Now, within 8 miles of the river, 96% of the sandhill cranes' diet is found in waste corn. The remaining 4% is the critical invertebrate component which provides protein and calcium for egg production. Too few whooping cranes have survived during the last century to permit the kinds of studies that would yield comparable nutritional analyses for these rare birds. What central Platte habitat is left for spring and autumn stopovers is as important as the summer and winter destinations themselves and not only for whooping cranes, but also for sandhill cranes, snow geese, mergansers, mallards, teal, pintail ducks, and bald eagles.

The interior least tern (*sterra antillarum*) is the smallest of the tern species approximately nine inches in body and twenty inches in wingspan. Adults are recognized by a white patch on the forehead contrasting sharply with a black crown, a bright yellow bill with a black tip, grey back, white underbody, and orange-yellow feet (Forbush and May 1955, p. 235-6). In recent decades, this species has been found on only a fraction of its former habitat that, early in the twentieth century, had stretched from Texas to Montana and from the front range of eastern Colorado and New Mexico to Indiana. The species was listed as endangered in 1985 and recent estimates place its population at about 4,800 (U.S. Fish & Wildlife Service 1997a).

Interior least terns nest in colonies amongst sparse beach vegetation, in shallow inconspicuous depressions in open sandy areas, in the blinding glare of the sun. Their protection is their camouflage of egg and young bird so closely resembling the color tone of sandy beaches and scattered pebbles that eggs can escape the eye even of the hawk. Tiny young squat so flat they hardly cast a shadow. Two or three eggs are laid in the May-July months, incubation lasts about 22-23 days, and the hatched chicks remain near the nest as a brood for a week or so and they are able to fly within about three weeks. Unlike the piping plover, interior least terns include small fish in their diet which adults hunt from the air by diving for minnows near the water's surface. In Nebraska, they are found on sandbars of the Missouri, the Loup, the Niobrara, and the Platte rivers, on the beaches of Lake McConaughy, and on shores of sandpits created by human extraction of gravel.

Least tern habitat on the Platte has been reduced and fragmented by encroaching trees and other woody vegetation. Traditionally, least terns would await the decline of spring peak flows and then scrape out their nests. With the coming of human manipulation of river flows all summer long for purposes of irrigation, power production, and municipal use, Platte river flows have become much less predictable (at least from the bird's perspective) and high flow periods are common long into nesting season. The birds are vulnerable to being flooded out and also to high water that continues long past the time they can wait to nest. One obvious adaptation to sustained

higher flows is to nest on higher exposed sandbars but today much of the main channel areas are clogged with trees and shrubs and are thereby no longer available. They do retreat to gravel pits but mortality of the young is high due to predators whose hunting challenge is much reduced in such small places that provide much inferior food sources (Currier, Lingle, and Walker 1985, p. 38-9).

Piping Plovers (*charadrius melodus*) are similar to least terns in that they much the same habitat and compete for the same nesting sites. They differ slightly from least terns in that they are a bit more tolerant of woody vegetation encroachment. This species was listed under the Endangered Species Act as threatened in 1985. A 1991 census estimated its population in both Canada and the U.S. to be about 2440 breeding pairs. The population is distributed from southeastern Alberta to northwestern Minnesota and along prairie rivers and reservoirs to southeastern Colorado. About 10% were estimated to breed primarily along rivers and 90% nested around lakes and ponds (U.S. Fish & Wildlife Service 1997a).

Piping Plovers are a stocky robin-sized shorebird about 6-7 inches long with a wingspan of about 14-15 inches (Forbush and May 1955). The head, back and wings are pale brown to gray with black and white highlights. They are most easily identified by a black strip across the forehead from eye to eye, a single black neck band, and white eye stripes. Like terns, plovers are birds of the sandy shore where they are capable of racing at such speed that it is easy to confuse their running with swift gliding. Beginning in May, females usually lay 4 eggs, one every other day. Incubation lasts for something in the range of 25-31 days, after which well camouflaged downy chicks survive by flattening themselves into the sand while parents feign crippling injury to draw away predators–e.g., skunks, racoons, coyotes, bull snakes, owls and hawks. Young birds can fly within about 21 days after hatching. Piping plovers walk or run from spot to spot seeking to feed primarily on insects, larvae, and snails.

Much of their required habitat has gone the way of that also needed by least terns. Faster fluctuating summer flows moving through incised channels laying between banks and islands supporting dense woody vegetation has increasingly confined least terns and piping plovers to ever more limited, fragmented, and scattered habitat.

PART II SOCIAL CONSTRUCTION OF THE CRISIS

CHAPTER THREE:
GETTING INTO THE FEDERAL NEXUS

"...all great values of this territory have ultimately to be measured to you in acre feet"
John Wesley Powell, speaking at the Montana Constitutional Convention in 1889 (Peirce 1972).

Degraded habitat for three birds–whooping cranes, piping plovers, and least terns--was intimately linked, at least in the view of the FWS and the larger environmental community, to the construction of Platte basin water facilities, most especially dams, reservoirs, and diversions. The Endangered Species Act of 1973 would force a confrontation between activities of water users in the basin and the needs of three birds listed under that law. The ESA has compelled a sustained twenty-seven year conversation about how to reconcile human water work with needs of the listed birds.

Two Traditions

The American west has always been a major federal project. The federal government has been the purveyor of cheap homesteads, subsidizer of railroads and highways, investor in military facilities, promoter of irrigation, builder of the Panama canal, fighter of native Americans, provider of reservations for native Americans, organizer of grazing resources, steward and restorer of soils beginning with the great "blow-out of the 1930's", and owner-manager of parks and forests. It is, in the eleven westernmost states (of the lower 48) by far the largest landowner. Federal agencies own almost half of the 17 Western states as compared to eastern states that have been overwhelmingly privatized in their landholdings. Nevada has the highest proportion of land under federal ownership (82.9%), Wyoming is 48.9% federally owned, Colorado (36.3%), but federal holdings in Nebraska amount to only 1.4% of that state's total area (Riebsame and Robb 1997: 58).

Significant federal presence in the West has always meant close relationships among federal, state, and local natural resource interests but in the 1960's–1970's, the rules that governed the relationship drastically changed.

For decades, the Bureau of Reclamation was promoted by its powerful constituencies as a force for progress by advancing the story of the small struggling community starved for essential services–educational, religious, health, commercial, and financial–transformed into a thriving population center by a bureau dam. In the early years of the twentieth century, the U.S. Fish and Wildlife Service served that same vision by attempting to remove those predators that threatened to make the West unsafe for a cow. When the Bureau of Reclamation (USBR) constructed the large dams and reservoirs on the Wyoming's North Platte, and when it built the system of Colorado west and east slope storage reservoirs and a system of pumps and tunnels bringing Colorado river water to the burgeoning populations on the east side, the federal-local vision was

utilitarian commodity production. There were no ESA or other environmental mandates to be fulfilled. But, a spate of environmental legislation began to change all that and, most especially passage of the Endangered Species Act in 1973, transformed the USFWS into an agency that would define itself by the number of dam projects modified or blocked in the name of an alternative vision of social progress centered on free flowing streams. In the 1970's and 1980's the Bureau of Reclamation would haltingly re-orient itself toward a revised mission, that of water service at least somewhat constrained by environmental stewardship. Old constituencies of both agencies would feel that their 19th and early 20th century compacts with the federal government had been betrayed. New urban, rural ranchette, and environmental resource constituencies would push hard in Congress and the courts for new visions.

The Endangered Species Act (ESA)

> "I think the ESA is a remarkable piece of legislation,...It's the one federal environmental statute that deals with scientific uncertainty and makes it clear that the species will not bear the burden of scientific uncertainty"
>
> Dan Luecke,
> Environmental Defense
> *Colorado Water* March/April, 2002, p. 9

North America's freshwater habitats continue to support an extraordinary diversity of biotic communities, particularly as compared to those found in what have been similar habitats around the globe. But U.S. freshwater habitats are also among the most threatened by flow alterations, habitat degradation and fragmentation, and introduction of non-native species. All this has taken a heavy toll. In the U.S., only two percent of natural rivers and streams are free flowing. Consequences of human disturbance has been staggering: 67% of freshwater mussels and 65% of crayfish species are rare or imperiled, 37% of freshwater species are at risk of extinction, 35% of amphibians that depend on aquatic habitats are rare or imperiled (Abell, Olson, Dinerstein, Hurley, and et al 2000). In the late 1960s the whooping crane, Bald Eagle, Peregrine Falcon and Eskimo Curlew were all considered endangered (U.S. Fish & Wildlife Service 1997b). Early concerns about this habitat loss and consequent threats to plant and animal species led to calls for protective legislation, and those efforts resulted in the eventual passage of the current Endangered Species Act (ESA) (1973).

Under ESA, existing federal water projects are subject to federal discretionary authority and control if any appear to affect habitat of listed species (Echeverria 2001). Under Section 7, any federal agency must insure that activities that it authorizes, funds, or implements do not jeopardize the continued existence of any listed species. Nor may any federal actions adversely modify or destroy 'critical habitat' of any species (Bean 1999). Federal agencies are mandated to coordinate their efforts with the Fish and Wildlife Service to try and ensure that no species are adversely impacted by any agency action. Section 4 of the ESA provides for designation of critical habitat, which consists of land, water, and airspace required for the normal needs and survival for the designated species (Anderson 1998). The ESA has, therefore, changed water policy in the West, by changing the mandates of the Fish and Wildlife Service and the Bureau of Reclamation.

When dependent upon federal government projects, or when non-federal water facilities need federal approvals, water users planning to undertake actions that can reasonably be expected to increase jeopardy of a listed species must find ways to achieve ESA compliance in order to gain essential permit(s). For 29 years now, the ESA has been an unwelcome guest at virtually every Western water user dinner party.

The concept of jeopardy, and the manner in which jeopardy is defined and implemented by the FWS, resides at the center of ESA's operational meaning. The definition of jeopardy establishes a bar against which the FWS evaluates all federal actions affecting listed species. Not surprisingly, the issues surrounding the "jeopardy standard(s)" are complex, subtle, and draw fire from virtually all resource constituencies. The essence of the concept is simple enough. Jeopardy for a species is created when an action is undertaken that can be reasonably expected to reduce the likelihood of survival and recovery of a listed species (Rohlf 2001, p. 118). However, it is not a simple matter to draw a biological line in the policy sand and then straightforwardly halt threatening actions of other federal agencies, their state and local constituencies, or non-federal authorities. Environmentalists have pushed hard for strong interpretations while resource appropriators seek to gain their permits with regulatory certainty at least possible cost. The FWS struggle to define the jeopardy standard is grist for other studies (Rohlf 2001)

In 1978, in an effort to protect the whooping crane, the Fish and Wildlife Service designated a 56 mile-long by 3 mile-wide stretch of the Platte River between Lexington and Chapman, Nebraska as critical habitat. Five additional species that depend on the central Platte were also listed as threatened or endangered: the Least Tern (1985), Piping Plover (1985), Western Prairie Fringed Orchid and American Burying Beetle (1989), and the Pallid Sturgeon, which inhabits lower reaches of the Platte mainstem (1990) (U.S. Fish & Wildlife Service 1997b) (Echeverria 2001). The USFWS, in order to implement its ESA mandate, would take a seat at the Platte basin water users' repast.

National Environmental Policy Act (NEPA)

By the 1960's it was clear that federal programs had worked in conjunction with state and local constituencies to create significant environmental problems. It was becoming clear that, if federal action was an important part of the nation's environmental problems, the federal government must also be the source of potential solutions (Andrews 1999).

In 1969, Congress enacted its first piece of major environmental legislation, the National Environmental Policy Act (NEPA). NEPA declared it to be national policy to maintain "productive harmony" between humans and nature while fulfilling economic and social requirements of present and future generations of Americans. NEPA stipulated a set of tasks and procedural requirements that mandated preparation of an environmental impact statement for each major federal action that would significantly alter the natural environment. Each environmental impact statement would assess environmental impacts of proposed actions, and it would also advance suggested options to address the environmental impacts that would be caused by the proposed actions (Andrews 1999).

When some USBR water facilities in the basin, along with certain other non-federal projects, had been found to have created jeopardy for listed species associated with the central Nebraska critical habitat, the project sponsors would have to begin to search for options to redress matters. Any solutions to be developed would be advanced for scrutiny under two lenses–one conducted under the auspices of NEPA that eventuates in the production of an environmental impact statement (EIS), and another of the United States Fish and Wildlife Service as it worked to implement the ESA by formulating a biological opinion regarding the proposed action and, if jeopardy is to be found, working to offset projected harm to species by insuring construction of a viable reasonable and prudent alternative that could maintain and improve habitat for listed species.

ESA and Reasonable and Prudent Alternatives

To obtain ESA compliance, any federal action agency proposing to undertake a project that may negatively affect one or more listed species is required under section 7 to consult with the USFWS to determine whether that agency believes that the proposed action will likely jeopardize the continued existence of endangered or threatened species (Freedman 1987). Any action agency that receives a FWS 'jeopardy opinion' is technically free to make its own decision about the consistency of its proposed action with section 7. However, since the FWS biological opinion will be given weight in any citizen's legal challenge to the proposed action, other agencies are seldom willing to proceed with their challenge in face of a FWS biological opinion specifying jeopardy. Furthermore, the FWS will be unwilling to endorse any action agency's proposal that would be inconsistent with its own biological opinion stating a jeopardy rationale because that agency would predictably find itself subject to civil lawsuits from citizens who follow closely the disposition of jeopardy opinions (Bean 1999). The ESA specifically has empowered citizens to file suit against the Fish and Wildlife Service and other resource agencies and resource users for violations of the act.

Remedy for having been found to be a cause of "jeopardy" to listed species is to be found in any one or more of three ways: 1) shut down and thereby eliminate that cause of jeopardy; 2) revise the project so as to eliminate cause of jeopardy; or 3) undertake to create a "reasonable and prudent alternative" (RPA) that permits the project to continue while at the same time providing relief for the listed species. The holy grail of the section 7 consultation process for a resource user, singly or in collaboration with others, is to create either a project revision or a RPA, have it reviewed under NEPA/EIS process, and have it judged to be satisfactory by the FWS–i.e., sufficient to offset the original harm to the species. All this will produce the prize–sanction to continue operation with the promise of regulatory certainty.

Future Without A Collaborative Recovery Program

Since the late 1970's, the Fish and Wildlife Service has issued "jeopardy biological opinions" for virtually all water projects that deplete flows in the Platte River Basin. In 1993, the Fish and Wildlife Service issued a series of draft jeopardy biological opinions for existing municipal and irrigation reservoir supply projects located on national forest lands in the headwaters of the South Platte River Basin in Colorado.

In principle, the barrage of jeopardy opinions could have caused major disruptions of water supplies for agriculture, cities, and power production. However, the relevant federal action agencies (following the lead provided by the FWS's jeopardy opinions) granted temporary approval for continued operation of permitted facilities on the condition that serious negotiations would be undertaken by Platte basin interests and that, during the negotiation period, specific actions involving land, water, and money would be undertaken to mitigate jeopardy. The purpose would be to create a basin-wide solution. There was clear understanding that if negotiations were to fail, ESA section 7 consultations would be reopened. Water users in the Platte River Basin were thereby provided an opportunity to voluntarily come into compliance with ESA, but there were fearsome consequences for no action.

Failure to accomplish a satisfactory collective solution on a basin wide basis would mean individual consultations during which the Fish and Wildlife Service would evaluate each individual project against what the agency judged to be a basin-wide target flow shortage of 417,000 acre-feet per year at Grand Island, Nebraska. Even though users never agreed to the shortage numbers presented by the Fish and Wildlife Services, they were bound to them. If individual water users failed to build their own collective reasonable and prudent alternative in an acceptable manner, the Fish and Wildlife Service would devise its own solution on an individual case-by-case basis as federal permit renewals came up. It would do so within a frame centered on what was to water users a shockingly high FWS water shortage calculation–an annual average of 417,000 acre feet –and a FWS determination that there needed to be 29,000 acres of high quality listed species land habitat on and around the central Platte.

The Platte basin permitting crisis would lead directly to the governors of three states and the Secretary of the Department of Interior signing a memorandum of agreement in June, 1994 that pledged a good faith effort to construct a cooperative program to restore and protect critical habitat in Nebraska for the whooping crane and other listed species. If this cooperative effort were to fall through, then the FWS would then return to individual ESA section 7 consultations that would not have the advantages potentially available under a basin-wide collaborative program. Such a threat constituted strong incentive for basin water users to collectively seek relief from the jeopardy opinions to which they were subject. To once again gain a modicum of control over their operating environment–to obtain "regulatory certainty"--water users would have little option but to join in a collaboration with each other, environmentalists, and the Department of Interior to create a basin-wide solution.

CHAPTER FOUR:
COLORADO ENTERS THE FEDERAL NEXUS

The South Platte river heads in high mountains southwest of Denver and then flows through the northeast quadrant of Colorado, the Missouri River Basin's most urbanized state. (See Figure 5).

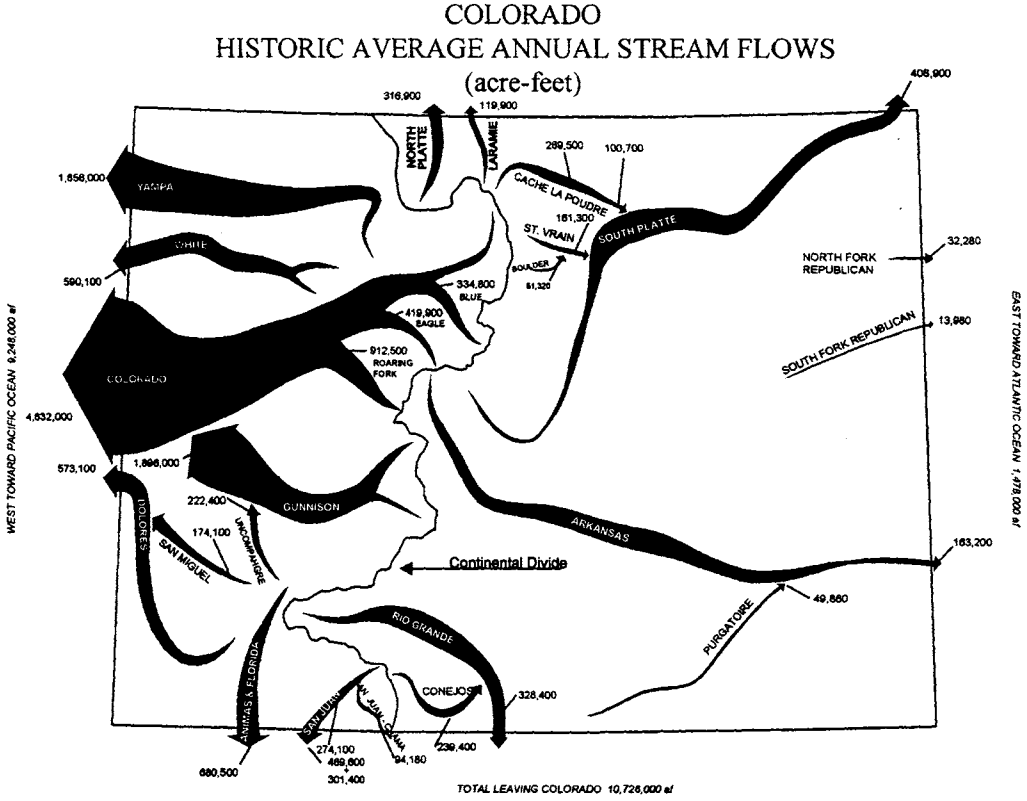

Figure 5 Colorado water outflows, major rivers

The Front Range, much of which is watered by the South Platte and its tributaries, is a 160 mile long metropolitan stretch along the eastern slope of the Rockies. It is home to 80 % of the state's residents and has a rapidly growing economy fueled by corporate energy enterprises, the largest complex of federal agencies outside of Washington, D.C., universities, tourism, high-tech and service industries. Scarce water supplies and high demand by agriculture and subsequent urban needs prompted the construction of major transmountain diversions from the West slope of Colorado to supplement native flows. Transmountain diversions have been:

1. traditionally in the service of agriculture, but in recent years have significantly shifted to serve demands of the metropolitan areas;
2. focused on expansion needed to sustain urban and industrial growth;

3. historically discharged, used repeatedly, and returned to streams in the South Platte basin thereby supplementing the native flows.

The greater Denver area has grown rapidly since World War II, but beginning in the 1970's the cities of the Front Range—from Ft. Collins on the North to Loveland, Longmont, Boulder, to Colorado Springs and Pueblo on the South—experienced extraordinary growth that clustered in dozens of towns and cities strung like beads on and near the north-south Interstate 25 string. The front range has become the heart of the ski/outdoor "mountain-chic" lifestyle so attractive to the high-technology personnel. But, to serve the burgeoning demand, there are only a few water supply options available to the population centers as they competitively seek to expand their respective tax bases by attracting the next "big box" retail outlet, and post-industrial information intensive enterprise:

1. further dry up agriculture to move water to lawns, gardens, fountains, golf courses;
2. seek additional or enlarged transmountain water diversions;
3. water conservation and re-use;
4. deplete aquifers, especially largely non-renewable Denver basin supplies;
5. create new storage facilities to capture the modest remaining peak flows of native water.

The greater Denver metropolitan area has added about 510,000 residents during the 1990's, and it is projected to add another 1 million to its 2.3 million population by 2020. Flows vary widely on the South Platte reach by reach and between diversions, due to differences in land and water use. Upstream from Denver, the South Platte is regulated by large water supply/flood control reservoirs. Near Denver, most of the South Platte flow is diverted to city pipelines and returns to the river via wastewater treatment facilities. These municipal and industrial returns are supplemented by northern Colorado river tributary flows and deliveries from the west slope upper Colorado river basin as the South Platte wends its way northeast to exit the state near Julesberg, Colorado, beyond which it flows into western Nebraska.

Colorado Nexus: Denver Water

The Denver Board of Water Commissioners (Denver Water), historically, did not rely on federal funding to capture and deliver its water supply. As a young city, Denver used its resources to purchase land, litigate rights, and develop the Moffat and Roberts Tunnel collection systems that brought to the city and its suburbs west slope water captured in several reservoirs including its jewel, the Dillon Reservoir. By the 1960's, Denver considered itself as the premier water provider of the greater Denver metropolitan area (Cox 1967); (Lochhead 2000). Denver Water had become a large bureaucracy operating 31 pumping stations, 32 storage reservoirs, several water treatment plants, and a billion dollar capital expenditure program (Gottlieb and Wiley 1982).

By the early 1970's, Denver was no longer untouched by federal environmental law. By the time the Foothills water treatment plant was proposed, many environmental laws were in place, and a strong opposition to the project emerged from the Environmental Protection Agency

and environmentalists. As Denver Water proceeded with its plans for Foothills and the Strontia Springs Dam, it had to confront the uncomfortable realities presented by the federal Clean Water Act, National Environmental Policy Act, Federal Land Management Act, and the ESA. The Foothills facility posed no ESA problem, but after a long process of negotiations involving other Federal Environmental legislation ending in a 1979 settlement, Denver received permission to proceed with the Foothills system which was finally completed in 1983. Through much public controversy, the Foothills Treatment Plant came online, but only under the agreement that Denver Water would conduct a system wide environmental impact statement for its water projects, implement a water conservation program, and appoint a citizens advisory committee to the Denver Water Board (Lochhead 2000). Denver Water, by that point was firmly in a relationship with the federal environmental agenda.

Colorado Nexus: Colorado-Big Thompson and the Northern Colorado Water Conservancy District

By the 1930's, irrigators planting more than 3 million acres on the Front Range and eastward fringes of the South Platte were annually running short of water from new lands being brought into production, and from a shift from grain to more water intensive crops. From 1925 to 1933 farms had less than half of the water needed. Farmers, along with the Great Western Sugar Company, Platte Valley ranchers, Colorado Agricultural College, local newspapers and chambers of commerce, organized the first Northern Colorado Water Users Association in 1934 to lobby for diversions of water across the continental divide (Abbott, 1976) (Tyler, 1992). The Bureau of Reclamation started construction on the Colorado-Big Thompson project (C-BT) in 1938 and finished most of its construction by 1953. The C-BT project diverts water from the Colorado River to the Big Thompson via the 13.1 mile Alva B. Adams Tunnel. Compensatory storage for west slope users was provided by Green Mountain Reservoir located on the Blue River.

The Colorado-Big Thompson Project was one of the most complex projects undertaken by the Bureau of Reclamation in the West. It consists of over 100 structures integrated into a transmountain diversion system that provided supplemental water for agricultural and municipal users on over 720,000 acres of Colorado's northern front range and a stretch of eastern plains along the South Platte. The project has annually diverted volumes ranging mostly between 220,000 and 260,000 acre feet (310,000 acre feet is maximum) from the Colorado river headwaters on the West side of the continental divide to the Big Thompson drainage, a tributary of the South Platte. By comparison, Denver Water's annual diversions from the West slope have been in the range of 110,000 acre feet. The project is sponsored and operated by the Northern Colorado Water Conservancy District which apportions the water to more than 120 mutual ditch company associations, 60 mutual reservoirs, and eleven towns and cities. Electric power revenues produced by six powerplants though which water drops on its way down the east side has done much to subsidize re-payment of initial costs of capitalization.

The Northern Colorado Water Conservancy District (NCWCD) was created to sponsor and manage the operation and repayment of the C-BT project within terms and conditions established by USBR. Having been constructed with federal dollars, the C-BT project would necessarily operate under the terms and conditions specified in permits to be granted under

USBR's on-going discretionary authority. That, in turn, would mean consultation as between NCWCD, the USBR as the federal action agency (USBR), and the FWS.

The C-BT's original mission was to supply supplemental water to agriculture and municipalities within Northern's boundaries. In 1957, the first full year of water deliveries, there were 720,000 acres of land in production in the district; but by 1990, urbanization had reduced the acreage to about 630,000 (Tyler 1992). Northern's interest is best served if water released by agricultural dry-ups is put to beneficial use within district boundaries. Denver's suburbs, especially, covet Northern water, and the district has set itself against water raiders from outside entities.

Colorado Nexus: Poudre River Mountain Reservoirs on U.S. Forest Service Lands

Mountain storage reservoirs at higher elevations are highly valued because they afford the maximum delivery options by gravity flow, deeper narrow canyons permit smaller dams, less water surface exposure per unit volume and cooler temperatures reduce evaporation losses as compared to plains reservoirs. These advantages have made mountain sites prime candidates for reservoir construction, and most such mountain reservoir sites in the West were located on federal land, especially federal forest land. Many dams, reservoirs, canals, and pipelines have been constructed on U.S. Forest Service land–some placed there well before creation of the U.S. Forest Service--and operate under permits granted by the U.S. Forest Service (Blumm 1994).

In 1991, six special use permits expired for reservoirs on the upper Poudre river, the biggest tributary to the South Platte. These facilities were owned by four front range cities, one irrigation mutual company, and the Public Service Company of Colorado, now known as Excel Energy, and were located on the Arapaho-Roosevelt National Forest. It quickly became apparent to the reservoir operators that the Forest Service would consult with the FWS as required under the terms of the ESA. During the course of the permit renewal process, the Forest Service sought to impose "by-pass flow" regulations on the reservoir operators to advance its environmental forest habitat agendas. All of this threatened to reduce yields of the projects, and Colorado water constituencies created a firestorm of protest in Colorado and eventually in Washington D.C. (Lochhead 2000). Then, in June of 1994, the FWS issued its draft biological opinion that concluded that any Forest Service renewal of the six mountain reservoir permits would jeopardize the existence of the whooping crane, least tern, piping plover, in Nebraska critical habitat, and also pallid sturgeon further downstream on the lower Platte.

The Forest Service at that point only had a total of seven permits under consideration for renewal on the Front Range, but the agency was contemplating that over a hundred would be coming up for review within a a few years after the turn of the new century. The situation was quickly becoming impossible for all parties. There was only one reasonable option. The Colorado water users on the Poudre and Colorado South Platte basin would have to work collaboratively with the FWS to do collectively what could not be individually accomplished–i.e., create a reasonable and prudent alternative that could serve the needs of listed species in central Nebraska and provide regulatory certainty for water users serving the needs of millions of citizens in the three basin states.

CHAPTER FIVE:
NEBRASKA AND WYOMING ENTER THE FEDERAL NEXUS

Nebraska Context

Kingsley dam, always the heart of a non-federal project, closed its gates in 1941 to begin filling Lake McConaughy on the North Platte near Ogallala, Nebraska. As the reservoir filled, the spring of 1943 bore witness to especially severe Missouri River flooding. This episode, in the context of a history of serious Missouri floods (e.g., 1881, 1903, 1915, 1926, 1934), the United States Congress responded by passing the Flood Control Act in December, 1944. That legislation contained a compromise Missouri River Basin Plan that had evolved out of a political struggle between the Army Corps of Engineers (Colonel Pick) and the Bureau of Reclamation (Assistant Engineer William Sloan). The Kingsley dam works and Lake McConaughy, while never a part of Pick-Sloan, has coordinated operations with other facilities, including those of the encompassing Missouri River Basin Pick-Sloan plan that called for 98 reservoirs and dams storing 85 million acre feet of water plus miles of levees and floodworks (Thorson 1994). This vision was promoted by economic and political entrepreneurs during the golden age of surface water development in the 1940s through the early 1970's. For its proponents, Pick-Sloan was a progressive force for flood control and economic growth in the Missouri Basin that would come with a flourishing irrigated agriculture, industry, flat water recreation, and barge traffic. For opponents, Pick-Sloan was a nightmare that promised wasteful destruction of wildlife and fish habitat, serious barge traffic problems, inundation of Native American lands and mishandling of tribal rights, trapped sediment, and a mammoth drain on the federal treasury for benefit of a privileged few (Gaul 1993: 212-3). The Pick-Sloan wish list was never completed as imagined–however 55 of the reservoir projects were completed or were under construction by the late 1990's.

CNPPID/NPPD

Central Nebraska Public Power and Irrigation District (CNPPID or Central) produces hydroelectric power at Kingsley Dam and delivers irrigation water to farmers working 215,000 acres of high quality farmland in central Nebraska. Central's network of canals and hydroelectric production facilities stretch over 170 miles along the North Platte, the very lowest end of the South Platte, and the main stem. (See Figure 6). CNPPID operates a 75-mile long supply ditch–Tri-County Canal--that delivers water to three major canals that together serve 105,000 acres in three counties and another 7,500 acres in two other counties. On Tri-county Canal, Johnson lake serves as a re-regulating pool to insure stable controllable flows into the three lower distributaries (See Figure 6).

Lake McConaughy releases flow through five hydroelectric plants. Their power revenues subsidize operational costs of the CNPPID project, and make possible substantially lower

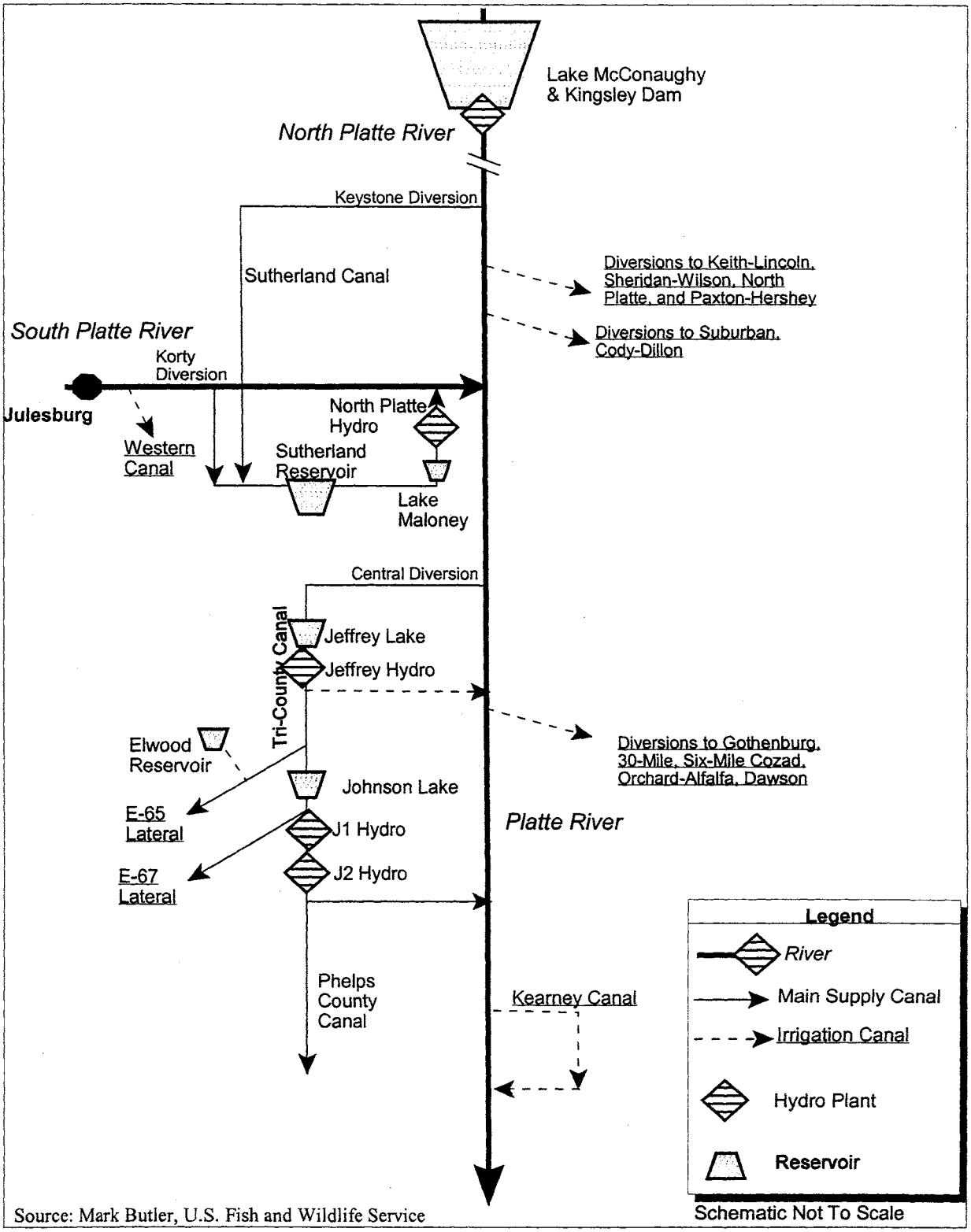

Figure 6 Developed facilities along the Platte river in Nebraska

irrigation water rates for agricultural users. CNPPID was formed in 1933, secured final approval for construction of the project in 1935, and closed the gates on the newly completed Kingsley dam in 1941. Central operates from headquarters in Holdrege, Nebraska. It sells its electric power production, and coordinates its water releases that turn the turbines under terms of several contracts with Nebraska Public Power District (NPPD). It is a bit too simple, but the essence of the relationship is that CNPPID produces irrigation water and electric power, while NPPD primarily conveys electric power to end-users.

Basic CNPPID/NPPD management strategy is to release flows from Lake McConaughy to coordinate with and supplement South Platte flows from Colorado. The largest component of the project is Kingsley dam holding back Lake McConaughy which, with a capacity of 1,800,000 acre feet, forms the largest reservoir in the Platte basin. Kingsley is a 3.1 mile long hydraulic fill dam across the North Platte. McConaughy is filled by the North Platte river and by return flows from irrigation diversions out of Wyoming's string of North Platte reservoirs (See Figure 7). When filled to capacity Lake McConaughy measures three miles wide and more than 20 miles long, and covers 30,500 acres. In addition to providing an average of 285,200 acre feet of irrigation water each year, lake water serves hydropower, flat water recreation, and groundwater recharge for wells.

During summer months, NPPD moves beyond its role as electricity distributor and uses McConaughy storage rights it holds to serve seven older smaller irrigation systems holding river diversion priorities senior to those of CNPPID/NPPD and operated by mutual companies located between Brady and Kearney, altogether providing surface irrigation water to about 75,000 acres of farmland.

By the 1980's NPPD had evolved into the largest electric utility in Nebraska including some facilities located well beyond the river segments critical to this story. Among its generating units are four steam plants, one nuclear facility, nine hydro plants (one of which is the North Platte Hydro Unit at Lake Maloney), three diesel plants, and three combustion turbine plants. Three of Central's hydro plants--Jeffrey, Johnson No. 1 and Johnson No. 2--each with a capacity of 18,000KW, are remotely operated from Central's control facility in Gothenburg. With the addition of the 50,000 KW Kingsley Dam unit, also operated at Gothenburg, Platte river water generates up to 104,000KW of electricity for CNPPID which is then wholesaled to NPPD.

Federal Energy Regulatory Commission (FERC)

The Federal Energy Regulatory Commission (FERC), created in 1977 as the successor to the Federal Power Commission, reviews permit renewals for about 2,600 hydropower dams in the United States. Created by Congress in 1920 to promote and regulate private development of hydropower facilities, the original Federal Power Act was a signal achievement of progressive American politics. It established a detailed regulatory review process to insure that citizens of the future could have discretion in deciding terms and conditions for granting new licenses–or even whether to grant them at all. The Federal Power Act, through the Commission, authorized private enterprises to own and operate power projects on public waterways subject to conditions specified

in project licenses that had maximum terms of 50 years. Congress was careful to create no vested right to relicensing. FERC now regulates the operation of most non-federal hydropower capacity–about 20,000 megawatts (Western Water Policy Review Advisory Commission, 1997).

FERC must give equal consideration to fish, wildlife, recreation and other uses along with power during its licensing decision. In 1986, Congress directed FERC, to include conditions–in addition to those imposed by the ESA--that protect, mitigate and enhance fish and wildlife based on USFWS recommendations. FERC is required to consult with federal, state and local resource agencies in its licensing decision, and under NEPA is obliged to prepare an environmental impact statement. About two-thirds of licenses for non-federal hydropower capacity in the West expire between 1997 and 2010.

Original licenses were issued for CNPPID and NPPD operations in 1937. They expired, therefore, in 1987. Given that riverine habitat had been dramatically impacted by the complex of CNPPID/NPPD river works that have controlled and diverted flows, that have moderated annual fluctuations, and constricted channels, and given the requirements of the ESA, there was little alternative but to somehow begin consideration of listed species habitat requirements. The re-licensing discourse that began years prior to 1987 was an obvious place to insert the new environmental agendas that had come with passage of the Endangered Species Act of 1973. The two districts were squarely in the federal nexus.

Wyoming

The North Platte river originates in north central Colorado near the continental divide and flows through Northgate Canyon into Wyoming. The stream continues in a northerly direction into central Wyoming and bends east near Casper and then southeast into western Nebraska where it fills Lake McConaughy (Figure 7). Major tributaries are the Encampment, the Medicine Bow, and the Laramie Rivers, which are fed by snowmelt.

The stream is one of the most highly utilized in the West. Although less than half of Wyoming's North Platte Basin is federally owned, the federal government owns over half of the that state's area. Most of the state's water resources are either on federal land, adjacent to it, or dependent upon it. Wyoming's water use has been dramatically impacted by a 1945 U.S. Supreme Court decree that allocated water flows as between Wyoming and Nebraska, the passage of the ESA in 1973, and by a later negotiated settlement with Nebraska over the uses of Wyoming's North Platte basin waters (Olphin 2001). Wyoming's North Platte water users are in a relationship with the federal ESA because they are the beneficiaries of seven federal water projects that capture a total of 2.8 million acre-feet of water–for irrigation, electric power, municipal use, and recreation. The Bureau of Reclamation stores over 3.1 million acre-feet of North Platte River water for irrigation and hydroelectric power in eastern Wyoming and western Nebraska, and owns the infrastructure for these projects that have had a dramatic impact on stream flow, sediment loads, and consumptive uses across the high semi-desert. As is the case elsewhere in the West, the USBR contracts with irrigation districts in Wyoming and Nebraska that serve as local project sponsors and operators.

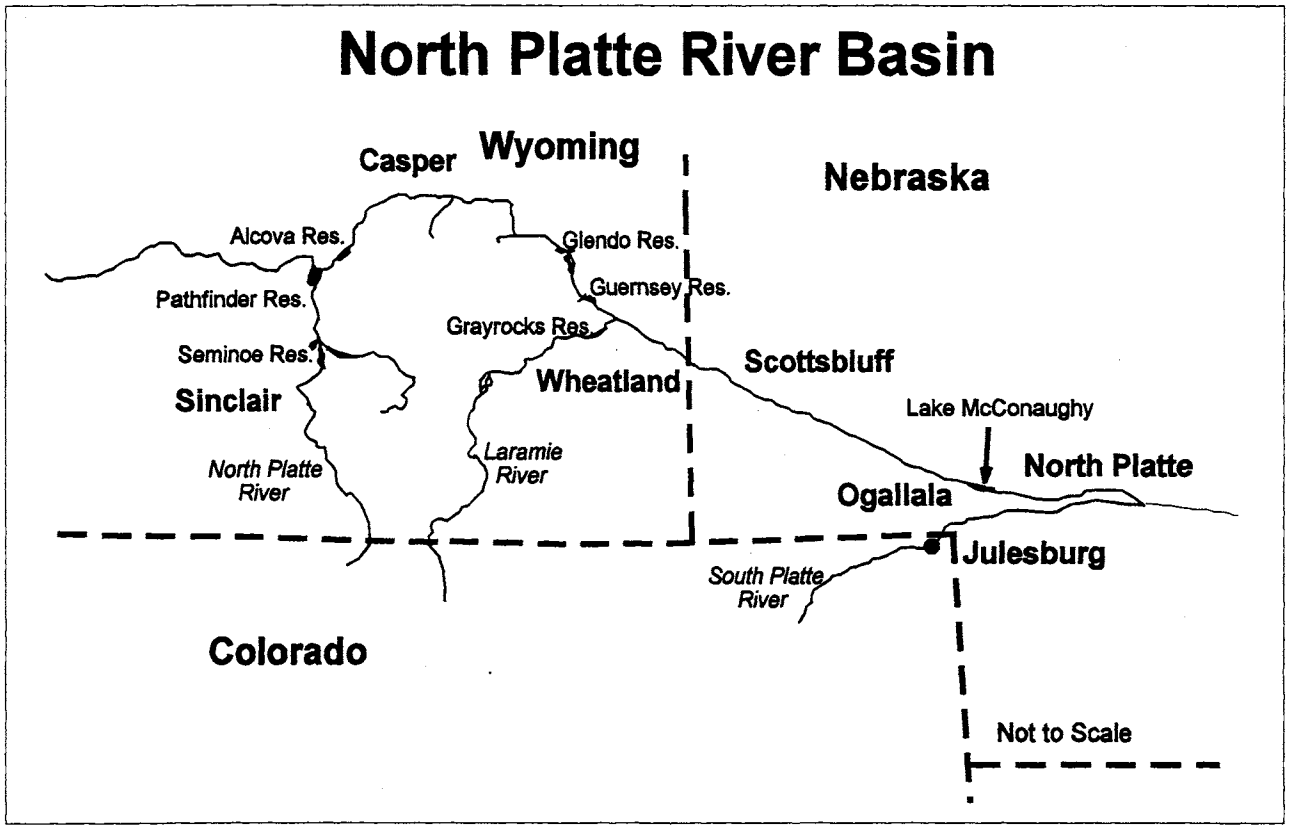

Figure 7 North Platte River Basin

The three major Wyoming USBR projects on the river are the North Platte, Kendrick, and Glendo (Water and Power Resources Service 1981). The North Platte Project extends 111 river miles from near Guernsey, Wyoming to Bridgeport, Nebraska. The city of Scottsbluff, Nebraska is located near the center of the irrigated area. About 8 miles below Guernsey Dam, the Whalen diversion in Wyoming directs flows into two large canals: 1) water heads from the south bank 130 miles in the Fort Laramie Canal along bench land commanding Wyoming fields below; and 2) the Interstate canal similarly serves irrigated land on the north bank along its 95 mile length and tails off into two Nebraska reservoirs, lakes Alice and Minatare. The North Platte project features two major storage reservoirs–Pathfinder 47 miles upstream of Casper and Guernsey well downstream–that store water for the more than 2000 miles of supply canals and drains. Pathfinder reservoir–originally provided 1, 070,000 acre feet of capacity–stores river flows under a 1904 priority. Waters released from Pathfinder, and other upstream reservoirs, supplemented by return flows, travel the river channel to Guernsey dam and reservoir which fine tunes flows for releases at Whalen diversion. Guernsey reservoir originally had a capacity of almost 74,000 acre feet, but that has been much reduced over the years by siltation.

The Kendrick project consists of Seminoe dam just above Pathfinder, Alcova dam located below Pathfinder to divert Seminoe water into the 59 mile Casper canal along which water flows to an irregular patchwork of irrigated land between Alcova and Casper, about 24,000 acres in all. Seminoe dam operates with a relatively junior 1935 water storage right. Seminoe reservoir, however, rivals Pathfinder's in capacity–1,017,280 acre feet. Obviously, most of Wyoming's

storage on the North Platte river is to be found in Seminoe and Pathfinder.

Glendo dam and reservoir are components of the Missouri basin's Pick-Sloan plan along with Gray Reef dam and its re-regulating reservoir way upstream. The Gray Reef unit is located just 2 miles below Alcova dam and was designed to hold and modulate the wildly fluctuating releases from Alcova dam. The Glendo (completed in 1958) and Gray Reef (finished in 1961) facilities have been managed in conjunction with the North Platte and Kendrick projects. The Glendo unit was designed primarily as a flood control facility with a total storage capacity of 789,402 acre feet. When at capacity, the reservoir extends 14 miles above the dam. Space was provided for eventually storing 115,000 acre feet of sediment–an estimated 100 year buffer for irrigators below. Although a large tub and a critically important workhorse for USBR's management of the North Platte, Glendo provides only 40,000 acre feet each year for irrigation and other uses in Wyoming and Nebraska, most especially along the Fort Laramie and Interstate canals. Of this sum, 15,000 acre feet are designated for Wyoming users and 25,000 acre feet are to serve Nebraskans. The 2001 U.S. Supreme Court endorsed settlement (Olphin 2001, p. 43-5) abandoned historical water use restrictions, and freed both Nebraska and Wyoming users to make use of their Glendo allocations anywhere within the Platte River Basin for any beneficial uses.

Glendo reservoir was designed primarily as a flood control facility to capture surging flood water inflows after which that water could be released safely downstream within river channel banks. The Glendo unit is the only facility on the North Platte expressly designed with such a large flood control feature that included a commitment that such flood waters not be dedicated to any beneficial use dependent upon that reservoir. An amendment to the Wyoming-Nebraska North Platte River Settlement of 1945 protected Nebraska' interest in maintaining something of regime of the river before Glendo's construction by providing that not more than 40,000 acre feet (plus space needed to compensate for evaporation losses) of water could be stored at Glendo for irrigation purposes in any given year. The total designated for storage of water tied to beneficial uses at any given moment was capped at 100,000 acre feet.

PART III STRATEGIC OPTIONS–LITIGATION, INDIVIDUAL PROJECT PERMITTING, COOPERATIVE PROGRAM

"When you marry the U.S. Treasury, you get the federal government for a mother-in-law."

Northcutt "Mike" Ely
Department of the Interior, Hoover Administration

By the 1970's a vigorous environmental movement backed up by the new environmental legislation catalyzed a rethinking of water management from a basin-wide perspective—more along the lines that had been envisaged by John Wesley Powell, John Muir, Aldo Leopold, and Rachel Carson. All this new thinking about inserting environmental agendas into traditional water management created a series of federal-state train wrecks across the West, most particularly in the Missouri and Platte River Basins:

1. Greyrocks Dam and Reservoir in Wyoming was challenged by environmentalists and the state of Nebraska employing the ESA, but was ultimately approved after an out-of-court settlement;

2. The Narrows project in Eastern Colorado was also challenged under terms of the ESA, but unlike Greyrocks, it failed for many reasons, among them obstacles rooted in environmental considerations;

3 Denver Water's Two Forks Dam and Reservoir project on the South Platte failed to win an essential permit required under the Clean Water Act but endangered species considerations were also significant;

4. The Fish and Wildlife Service, consulted by the Forest Service regarding permit renewals for mountain reservoirs on the Poudre River, did its assessment of impacts on listed species habitat in central Nebraska and then issued a jeopardy opinion. ESA requirements were now seen to impact water facilities on Forest Service land high in northern Colorado mountains hundreds of miles upstream. This episode sent shock waves around the basin because many water user facilities are located on federal land in the West.

All of this, plus a Joint Management Study of the Platte River Basin that was launched in the wake of the Narrows debacle, taken together with the intense discussion that had developed around re-licensing of operations at Kingsley Dam and Lake McConaughy, slowly ground out a grudging willingness in the basin states to talk. The discourse would lead to a 1994 agreement to seek a collaborative basin-wide solution that could provide for essential needs of listed species in central Nebraska and provide regulatory certainty for water users. Such is the stuff of chapters 6-9 of this Part III.

CHAPTER SIX:
COLORADO'S STRUGGLE IN THE NEXUS–WILDCAT, NARROWS, TWO FORKS, AND BY-PASS FLOWS IN MOUNTAIN WATERSHEDS

Wildcat

In the late 1970's, Riverside Irrigation Company and the Public Service Company of Colorado obtained from Colorado's Division 1 Water Court a right for storage and use of 60,000 acre-feet of water on Wildcat Creek, a small tributary of the South Platte with an annual average flow of only about 1.1 cfs at its confluence with the South Platte near Brush, Colorado (MacDonnell 1985), (Tyler 1992).

By that moment, construction of a dam virtually anywhere in the U.S. required a permit from the Army Corps of Engineers under section 404 of the Clean Water Act. For the purpose of the ESA, the federal action was a dredge-and-fill permit for the construction of a dam on an intermittent stream at a site located 250 miles upstream from the designated critical habitat for the whooping crane in Nebraska. Once the application was filed with the Corps of Engineers, an ESA review from the Fish and Wildlife Service was in order. The Wildcat project was then stymied by a FWS "jeopardy" opinion that left the Corps with no choice but to stop the Riverside Irrigation Company from proceeding given its potential harm to whooping crane habitat far downstream in another state. The FWS had determined that peak water flows were necessary downstream in Nebraska to clear out woody vegetation in a 50-mile riparian habitat supporting the whooping crane and other listed species. River diversions into Wildcat would be just more drains on the South Platte's diminishing flood surges.

The Riverside Irrigation Company and the Public Service Company of Colorado, with the help of Northern Colorado Water Conservancy District, filed suit in Federal District Court challenging the ruling of the Fish and Wildlife Service and the Army Corps of Engineers. Proponents of Wildcat contended that the FWS decision was a blatant attack on the water rights structure of the state of Colorado under the guise of section 404 of the Clean Water Act. They argued that, according to section 101 (G) of the Clean Water Act, states have the authority to allocate water and the states control over water was not to be superseded by the or impaired in any way. In essence, proponents contended that the Corps of Engineers had no authority to regulate water rights under state appropriations doctrine. Eventually the court ruled that the effects of downstream depletions would have to be considered when determining whether or not endangered species would, or would not, be affected by this water project (Tyler 1992). In the end, the Federal District Judge decided that the denial of a 404 permit by the Corps of Engineers was a proper exercise of federal policing powers. The Wildcat Project proponents were left with no other recourse but to go through the expensive, time-consuming, process of individual permitting with the Army Corps of Engineers and that agency would, under ESA, consult with the FWS. The FWS, in turn, had already filed against the project prior to the court decision. Hopes for Wildcat reservoir were, for all practical purposes, dashed. Wherever they stood on Wildcat matters, all parties could see that virtually any water project proposal would raise basin-wide issues that would compel action across state-lines. Federal laws and agencies were scratching a new form of handwriting on state water user walls.

Narrows

The Narrows Dam project on the South Platte river near Fort Morgan was first proposed in 1908 and in 1944 was introduced as one of the many projects authorized by the Pick-Sloan Act (Reisner 1986). The Narrows facility was originally proposed as a multi-purpose project providing irrigation water, flood control, and recreational water use for Northeastern Colorado. The Army Corps of Engineers, in 1931, sponsored the Narrows project for the purpose of flood control (Tyler 1992). After World War II, the Bureau of Reclamation took over responsibility for pushing the project and drafted plans that would create a dam approximately 147 feet high and 4 miles long, with the capacity to store 973,000 acre-feet of water (Woodward 1981), (Reisner 1986).

Protection for the whooping crane under the ESA soon became one of many issues and ultimately would have a major part to play in termination of project plans. Years of haggling over Narrows led to the social construction of benchmark figures of at least 10,000 acres of habitat to be restored in central Nebraska and the over-all idea of Platte basin target flows volumes for re-regulation to that habitat. The discussion was critical to the emergence of the concept of a basin-wide federal-state collaborative plan–something that DOI and governors of the three basin states would eventually agree to negotiate in1994.

In the end, the Narrows project failed for many reasons. The proposed location of the dam site was questionable on geological grounds. There was sharp conflict between upstream and downstream users–a serious political liability when supposed beneficiaries could not agree about project merits. Shrinking access to federal treasury dollars under Carter and Reagan administrations signaled changing federal priorities. Opposition to USBR river storage projects in general, and to the Narrows in particular, had increased to the point that it had become politically potent in state and federal arenas.

Finally, on January 20, 1983, the Fish and Wildlife Service issued its "jeopardy" opinion that had emerged out its evaluation of the Narrows proposal. The FWS found that the net annual depletion of flows to habitat would be 91,000 acre-feet. Such a massive impact on South Platte flow volumes and pulses could only damage whooping crane habitat (MacDonnell 1985). The doomed project was not, then, killed. It lingered for years in the vain hope that it could be revived. By the late 1990's its organizational sponsor, the Lower South Platte Irrigation District, quietly quit any attempts to prove diligence on behalf of project water rights a decision that effectively killed any future for Narrows.

Two Forks

The story of Two Forks is a tale of how a contemporary Denver Water invested heavily in its proposed project on the South Platte, hit a wall composed of environmental considerations, picked up the pieces, and re-made itself. When the history of Denver Water is written, it will be a story told in two parts--before Two Forks and after. The defeat of the Two Forks Dam and Reservoir project changed everything about the way the city of Denver has managed its water assets. Before the Two Forks project proposal failed, Denver Water's mission was to provide

water for the greater metropolitan area, and promote economic growth among its constituencies. With a budget and staff much larger than any other metropolitan supplier between Los Angeles and Chicago, Denver Water was a big battler for water, especially for transmountain diversions from Colorado's West Slope and thereby became a nemesis of those who stood in its way. After the failure of Two Forks, Denver Water would trim and re-configure its mission substantially. Before Two Forks, Denver Water worked to:

1. minimize water costs to its customers;
2. maximize system development and reliability;
3. keep its planning internal and proprietary;
4. minimize public involvement; obtain water from willing sellers if possible or by legal action if necessary;
5. employ Colorado courts as friendly forums within which to establish rights;
6. keep the federal government out of the picture.

After Two Forks, Denver Water's objectives shifted markedly in the direction of:

1. incorporating conservation and re-use;
2. preserving existing water yields in face of new environmental regulations;
3. moving away from least cost most reliable construction and operation in order to integrate other values into its operations—especially environmental impacts and public participation;
4. accepting federal involvement via NEPA, the Clean Water Act, and the ESA.
5. building alliances with Colorado west slope water interests and do the utmost to avoid lawsuits and the associated costly delays.

For nearly 100 years, Denver Water had entertained a proposal to build a massive dam on the Eastern slope to store South Platte River water and flows that it had already been diverting through the Roberts Tunnel from the upper Colorado river. By the early 1980's, Two Forks plans had been drafted in detail and were seen as an answer to future water needs in the Denver metropolitan area. Sustainable flows could be tapped in the South Platte River above Denver and in the Blue River (tributary to the Colorado river) above Dillon. Capturing such flows would take the largest water project in the history of Colorado, one that would create a 31 mile-long reservoir covering a surface area of 7,300 acres in Cheeseman canyon on the main stem of the South Platte River (MacDonnell 1985). In the end, Two Forks would promise to deliver 98,000 acre-feet per year to 41 cities and utilities in the Denver metropolitan area.

There were problems. In addition to obvious negative environmental impacts that associate with high dams and slack waters, there would be loss of prime recreation area in a beautiful canyon and a pristine free flowing stretch of the South Platte. The large storage reservoir (more than a million acre feet) was projected to annually yield less than 100,000 acre feet. In addition, the state of Nebraska joined environmentalists in opposing construction of Two Forks on the grounds that the huge storage project would undercut the historic regime of the river–i.e., flows in excess of Nebraska-Colorado compact minimums–and the loss of flood pulses would be damaging to listed species habitat in central Nebraska.

The politics quickly became ferocious. East/west slope water interests became deeply mired in polarized conflict and sharp divisions emerged within these two major blocs. The Two Forks project review eventually took 10 years and cost close to $40 million (Lochhead 2000). In 1989, after years of working amid intense wrangling of conflicting parties, the Army Corps of Engineers had completed its environmental impact statement; the agency was ready to issue the key permit. The only necessary signature left to obtain was that to be anticipated from Director of the Environmental Protection Agency, then William K. Reilly, President George Bush's newly appointed head. Over the objections of water interests in Colorado and his own agency's senior staff, Director Reilly had initiated a final review process that had taken 19 months. In what was a shocking move for a Republican administration that had been solicitous of the Western perspectives, in March, 1989, Director Reilly vetoed Two Forks on the grounds that the project would violate section 404 of the Clean Water Act. The shock waves reverberated strongly among water users across the front range and around the West. A new order of things was emerging.

By-pass Flows

As the FERC licensing process at Kingsley Dam and Lake McConaughy dragged on, as the struggle over Two Forks played out, long standing water projects far upstream in northern Colorado headwaters came up for permit renewals from the Forest Service. The facilities needing federal permits included reservoirs and pipelines for Fort Collins, Greeley, and a local mutual irrigation company, Water Supply and Storage. The reservoirs were located in the upper reaches of the Poudre river, the largest tributary to the South Platte.

Conflict over water as between federal environmental agendas and state users had been simmering for decades all over the west. National forest lands in Colorado, within which reservoirs and conveyance facilities were nested, had been set aside by presidential proclamation, and Congress had authorized the designation of national forest lands primarily to stop unregulated timber cutting that had threatened water supplies. However, Congress did not clearly address whether the government had authority over the water generated in, and flowing through, federal forests. As of the early 1960s, the Forest Service had no clear instream flow policy and had never claimed water rights for instream purposes. By the 1970s, when Congress passed its spate of environmental legislation specifically directing the Forest Service to protect the environment, the question of whether the Forest Service acceptance of state water adjudications came to be sharply posed. When permits for these Colorado mountain reservoirs on the Roosevelt-Arapaho National Forest came up for scheduled Forest Service renewal on their normal 20 year cycle, the new legal context triggered review and analysis under the Endangered Species Act.

Two issues drove the Forest Service's consideration of its water policy. 1) concerns about winter storage drying up streams below high mountain reservoirs and the threat that constituted for fish and wildlife habitat on forest lands; and 2) and the loss of listed species habitat along the central Platte in Nebraska brought to its attention by the FWS in consultations required by the ESA. By the late 1980's and early 1990's, the Forest Service began discussing the requirements for permit renewal for facilities on the Arapaho/Roosevelt National Forest. Water users were told that they must agree to open their gates to supply minimum winter stream flows to protect forest aquatic habitats (Neuman and Blumm 1999).

The Federal government can obtain water for federal use by either of two methods: 1) for a federal reservation, the Federal reserved rights doctrine has been invoked; 2) uses for other (non-federal) purposes, the federal government must proceed in accordance with the law of the state within which the water is located. Federal agency attempts to employ its reserved water rights doctrine has been seen by most in western water communities as an attempt to bypass state sovereignty over water resources seriously threatening orderly and socially just administration of water use under state law. In the late 19th century, local agricultural and municipal water interests had seen the privatization of public lands in mountain watersheds as a threat, had argued for establishment of the U.S. Forest Service in order to achieve resource management practices that would increase water yields, not reduce them (Gillilan and Brown 1997). They deeply resented the new twist in Forest Service policy that was threatening to reduce the yields of their long established water projects.

For its part, the Forest Service noted that it was required by law to impose by-pass flow conditions for forest habitat purposes on the two cities and a mutual irrigation company. The water users argued, in response, that federal demands for "by-pass" flows were prohibited by law.

Reserved Rights Doctrine

The Federal reserved rights doctrine has been highly contentious in the West for most of the twentieth century. The doctrine holds that the federal government, when setting aside lands for public purposes that require water, the very act implied a reserved right of water sufficient to fulfill those purposes (Arizona v. California, 373 U.S. 546 (1963)). This court-made position is traced back to the establishment of Indian reservations in 1888 (Winters v. United States, 207 U.S. 564 (1908)). The U.S. Supreme court has read this doctrine restrictively, to limit rights to the minimum amount of water necessary to accomplish the Federal purpose (Cappaert v. United States, 426 U.S. 128 (1976)). Reserved rights were interpreted as coming from unappropriated water at the time that the land was set aside, and that the right has an appropriation date back to the date of land reservation.

The federal government began to set aside large tracts of land in the late 1800s, establishing a public domain of Indian homelands, Army forts, historical sites, monuments, and wilderness areas. However, water issues were seldom directly addressed at the time of reservation. For years after the Winters decision (1908), federal reserved water rights were seen as a minor part of Indian law that applied only to Indian reservations until 1963 (Gillilan and Brown 1997). In many watersheds, reserved water rights have constituted a serious threat to state water users because so many Federal reservations were made sufficiently early–in the late 19th and early 20th centuries–that such priorities could be among the he more senior rights in a basin. In addition, the rights were rooted in federal law, not state law, and are presumably not subject to be diminished by states (Corbridge 1999 : 441-470). The entire concept of federal reserved water rights thus served as sufficient threat such that water users everywhere in the West organized to oppose federal actions that could potentially erode either their appropriations under state authority and their project water yields.

Legal Battle

In Arizona v. California (1963), the U. S. Supreme court, without appearing to invest as much consideration as some in the states would have liked, ruled that all federal land reservations, not only Indian reservations, fall under the reserved rights doctrine. In this case, federal agencies claimed water for Lake Mead Natural Recreation Area, Havasu Lake National Wildlife Refuge, and the Gila National Forest. The Forest Service had been party to that decision because of its holdings of forest land within the lower Colorado basin watershed. The agency then decided to pursue federal reserved rights for instream uses, to fill the needs of fish, wildlife, aesthetics and recreation. It also began to seek, and require via the permit process, "by-pass" flows.

The Forest Service has required by-pass flows only 15 times in reviewing 8,000 special use permits involving western water. Yet, these few efforts have been strongly opposed by the states. Western water interests fought a two-part battle to limit the impact of Arizona v. California finding:

1. they fought to insure that reserved rights claims would be adjudicated in state rather than Federal courts, keeping the issues before state judges, subject to state elections, appointments and influences;
2. they brought sympathetic cases designed to narrow the application of Arizona v. California.

Both strategies resulted in significant victories for water users. The Gila National Forest litigation serves as a case in point.

At the time of the Arizona v. California decision (1963), several western states had initiated general adjudications to clarify and settle water rights among users. The first of these to go to the U.S. Supreme court was adjudication taking place on the Rio Mimbres, in the Gila National Forest in New Mexico. In these proceedings, the Forest Service claimed Federal reserve rights for the forest based on implied reservation of water that took place when Congress passed the Creative Act of 1891 and Organic Administration Act of 1897. In this case, U.S. v. New Mexico, the Forest Service argued that instream flows were compatible with purposes of the Creative and Organic Acts, and consistent with the Multiple Use and Sustained Yield Act (Gillilan and Brown 1997). The special master appointed to the case found that water in the forest was in fact being used for purposes claimed by the U.S., and that these uses fell under the scope of reserved rights doctrine. However, the New Mexico District court rejected the findings of the special master, as did the New Mexico Supreme court on appeal. That Supreme Court held that the Forest Service could not claim Federal reserved water rights for instream purposes. This ruling was upheld by the U.S. Supreme Court in 1978, U.S. v. New Mexico. The Supreme Court looked closely at the Organic Act and chose to construe its language narrowly; it concluded in a 5 to 4 split decision that Congress only intended to establish national forests to improve and protect those forests within their boundaries, for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber.

The Gila National Forest represented a major setback for the Forest Service. The negative finding, from their standpoint, was an unhappy surprise, particularly given the strong suggestion

by the court in Arizona v. California fifteen years earlier that reserved rights doctrine could provide water for national forest uses. In response to the court's interpretation of the Organic Act's primary purpose, the Forest Service began to advance other rationales for making water claims. New arguments took center stage that centered on water uses for fire fighting, fire protection, flood, soil and erosion control. Most especially, the agency developed an argument for instream flows based on the primary purpose of watershed protection and fluvial geomorphology. Instream flows became necessary, in this modified line of argument, to transport sediment downstream and to maintain a viable stream channel, including meanders, reduced encroachment by vegetation, and decreased threat of flooding. This rationale boiled down to the need for instream flows for "channel maintenance" (Neuman and Blumm 1999).

Not long after the Gila case, the Forest Service tried again to make claims on water under the reserved rights doctrine, this time in Colorado where it held land in strategic locations in the watershed. It claimed water for a variety of purposes, using the channel maintenance rationale. Based on hydrological principles that determine the amount of stream flow needed to maintain stream channels in conditions "favorable" to water flows, this approach was a direct appeal to the purposes of the Organic Act. The time seemed right for a full consideration of U.S. Federal reserve rights doctrine.

The agency acted by trying to require "by-pass" flows–i.e. bypassing user impoundments--as a condition for renewal of special use permits issued to water users with holdings of infrastructure along the Cache la Poudre River within the Arapaho-Roosevelt National Forest. Immediately, the proposed by-pass flows became a jurisdictional issue: did the federal government have authority to override Colorado law, or did water user rights under Colorado state appropriation doctrine have priority?

Beginning in early 1991, the case unfolded in Colorado Division 1 Water Court, the judicial and administrative unit that encompasses the South Platte and its tributaries. During a costly year-long trial, the U.S. Justice Department, the Colorado Attorney General's Office, and Northern Colorado Water Conservancy District argued the complex legal and factual issues of federal claims of supremacy versus those of state and local water administration (Tyler 1992). As a consequence of consultation between the Forest Service and FWS, a biological assessment of the water users' facilities on the Arapahoe/Roosevelt Forest stated that the water facilities negatively affected endangered species habitat in Central Nebraska. Two separate environmental problems, then, had to be addressed:

1. negative impacts of reservoirs on aquatic habitat within the Arapho-Roosevelt forest immediately below those facilities in the upper Poudre basin;
2. negative impacts to endangered and threatened species downstream in Nebraska.

The Forest Service v. Colorado on the South Platte was high drama that drew the interest of water users and environmentalists around the country. The trial was a high stakes affair complete with armies of expert witnesses and considerable press coverage. Marked by much legal maneuvering and technical discussion, it became an extensive seminar on principles of fluvial geomorphology and associated sciences, complete with field trips (Gordon 1995). Permit holders had feared a loss of storage water and the cost of retro-fitting dams to allow small quantities of

winter by-pass flows for instream use.

The Colorado Division 1 Court found that claims made by the Forest Service were not necessary to fulfill the primary purpose of National Forests and, in fact, worked against fulfilling those purposes. The court questioned Forest Service methods and found that many streams chosen for illustration and quantification already contained diversions, showing only "subtle" differences above and below diversions. The court determined that those streams exhibited none of the undesirable characteristics that the Forest Service claimed could occur, and thus that long standing diversions did not constitute a threat to the integrity of the channels (Gillilan and Brown 1997). The Colorado court found that the water related purposes of National Forests were to enhance the capacity of downstream users to use water for irrigation and domestic purposes. The court also found that instream claims of the Forest Service would harm opportunity to store water to meet late season irrigation and municipal needs. The Forest Service appealed the rulings to the Colorado Supreme Court where that body ruled that the federal government should be allowed an opportunity to prove the necessity of instream flows in securing favorable conditions for forest purposes, but that such necessity had not been established in this case. The Colorado Supreme Court also ruled that the original intent of the Organic Act was to encourage development of the West by enhancing the quantity of water available to appropriators, not to reduce consumption of water by protecting instream flows (Gillilan and Brown 1997).

Water users, not wanting repeated costly and risky court trials over reserved rights issues, voiced their concerns to Colorado's congressional delegation about Forest Service aggressive use of the reserved rights rationale. Colorado political leaders, in turn, pushed the point hard in meetings with Department of Interior and USDA officials. An amendment to the Farm Bill, which was signed into law in April 1996, established a Water Rights Task Force to explore the by-pass flow issue. The Act also provided for an18 month moratorium on any Forest Service decision to impair a decreed right through by-pass flow requirement as a condition of a permit. The Task Force was formed and concluded its study deeply divided on the issue, 4 to 3. The By-Pass Flow Task Force Report, in its majority position, is a strong, one-sided argument against by-pass flows based on the assertion that the Forest Service has no authority to impose flow requirements, while the minority contended that such means are within Forest Service powers (Neuman and Blumm 1999).

Water users had, narrowly, obtained the support that they wanted but they saw the slim margins–judicial and political--that had protected them from serious loss of water yield from their mountain storage projects. Wise heads would counsel caution and the importance of addressing environmental issues within state frameworks. Federal agencies that could find satisfaction within state law and practices just might be agencies that could be coaxed away from repeated attacks under federal reserved rights doctrine.

In the aftermath of the Division 1 court battle and subsequent appeal to the Colorado Supreme court, Poudre river water users and the Forest Service were able to negotiate with some civility. It was clear to all parties that the negotiations on the Poudre had consumed time, money and personnel. The consideration of only five permits, out of more than 100 permits on the Arapahoe/Roosevelt Forest that would be all too soon coming up for review, had been complex and costly. With this in mind, an arrangement was formulated whereby the Forest Service would

issue new 20 year permits without by-pass flow requirements, with the condition that permitees accommodate the goals of the Forest Service without reducing yield of user water rights. This addressed the first issue of concern–channel maintenance in high mountain water sheds.

To this end, water users negotiated a Joint Operations Plan (JOP) that allowed local users to determine and control the timing and arrangement of water releases for high mountain channel maintenance and provision of habitat. The JOP satisfied both the water users and the Forest Service, but one organization objected and filed suit against the arrangement–Trout Unlimited. Its suit argued that the Forest Service had neglected its mission in negotiating the JOP. The case has been heard in U.S. District Court in Casper, Wyoming, but the judicial finding has yet to be announced. The biggest point that emerged out of the whole mountain reservoir struggle was, however, that neither the federal agencies nor the state water users could obtain what they wanted without cooperation of the other.

CHAPTER SEVEN:
NEBRASKA'S STRUGGLE IN THE NEXUS AT KINGSLEY DAM

Given that FERC relicensing was required for all hydropower facilities as their original licenses expired, and given that licenses for Kingsley dam and its related facilities were originally granted in 1937, it was inevitable that discussion would emerge around the application process in the early 1980's. That process would provide a once-in-a-lifetime opportunity to re-examine options and redefine the terms under which the projects would operate.

In 1984 CNPPID and NPPD began formally working on relicensing their projects with FERC (Gaul 1993: 224). In May of 1987, just prior to the expiration of the original licenses, the ESA required FERC to fully consult under Section 7 (U.S. Fish & Wildlife Service 1997b, p. 6). The licensing procedure was of interest to the Department of the Interior, Wyoming, Colorado, the Environmental Protection Agency, environmental organizations, and over 50 other parties. Discussions between FWS, FERC, NPPD and CNPPID were extended, detailed, energy consuming, costly, and torturous. In the early negotiating years, the Districts did their utmost to fight the notion that they should seriously contemplate yielding to the ESA agenda and openly seek the kind of compromise that would satisfy FWS's definition of habitat needs.

In February of 1996, FERC requested a formal consultation with FWS on the proposed relicensing of the Districts' facilities, prompting issuance of a FWS Biological Opinion. That opinion concluded that relicensing of Kingsley dam facilities would jeopardize the continued existence of the endangered whooping crane, least tern, pallid sturgeon, and the threatened piping plover. Also, it would result in adverse modifications of federally designated whooping crane critical habitat on the central Platte (U.S. Fish & Wildlife Service 1997a). In its biological opinion of July, 1997, the FWS presented two options to the Districts: 1) a stand alone option, in which the Districts would be individually responsible for their portion–as calculated by the FWS–of preservation of the critical habitat along the Platte; or, 2) to make the proposed re-licensing action an integral part of the Memorandum of Understanding initiating the Platte River Recovery Program. CNPPID and NPPD chose to integrate their re-licensing efforts with the basin-wide collaborative effort that had been launched in June of 1994, and that had produced an outline of a basin-wide solution by June, 1997. In July 1998, after 13 years and an expenditure of over $30,000,000, the Districts received their renewed 40 year licenses from FERC.

FERC–Kingsley Dam Operating Requirements

While FERC has authority to deny a license, its focus is primarily on terms and conditions to be included in the new license. FERC insisted that the facilities be managed in a way that would trade away some drought protection and power production in order to improve the health of aquatic ecosystems. The changes would be modest, but required acknowledgment of a very different operating philosophy than that which had informed the original licenses (Gaul 1993: 224). The licenses issued to the Districts are a mix of conditions to follow in operation of facility, a general mandate to cooperate in implementation in the 1997 Cooperative Agreement, more demanding requirements that would go into effect if the Cooperative Agreement effort should fail, and a "re-opener" clause that reserved FERC's authority to modify licenses in the future based on changed conditions or any information (Echeverria, 2001: 576).

Prior to issuing the FWS's final biological opinion, the Districts and the U.S. Department of the Interior (DOI) reached an agreement in principle for fulfilling license conditions for Kingsley dam. They obligate the Districts to take special actions for benefit of endangered or threatened species and other non-listed species. This agreement in principle is dependent upon successful development and implementation of the cooperative agreement. Actions essential to fulfill FERC licensing requirements were constructed as components of the proposed cooperative agreement. Among other things, the FWS called for an environmental water account at Lake McConaughy--specifically allotting a fixed percentage of in-flows to that account. This water would then be managed by the FWS on behalf of habitat for the listed species. During the three-year period that was then planned for negotiating a viable Cooperative Agreement (1997-2000) as required by the FERC re-licensing, the Districts agreed to begin re-operation of District facilities, land acquisition for species habitats, habitat restoration, and water conservation/supply measures. The two Nebraska Districts were not only caught up in a federal nexus as they had been since the very beginning of their operations, they had now become a centerpiece in the construction of a basin-wide collaborative solution with water users and environmentalists in two other states.

CHAPTER EIGHT:
WYOMING'S STRUGGLE IN THE NEXUS OVER GRAYROCKS–BIRDS GET A VOICE!

The Grayrocks Project began in the 1970s, when a coal-fired electrical generating plant was proposed for construction on the outskirts of Wheatland, Wyoming. Grayrocks Dam and reservoir--to be built on the Laramie River in southeastern Wyoming, a tributary of the North Platte--was needed to provide 104,110 acre feet of cooling water.(Simons and Associates Inc. 2000). The Rural Electric Administration granted a loan guarantee, and the Army Corps of Engineers issued a construction permit to Basin Electric Power Cooperative. The state of Nebraska and National Wildlife Federation countered with a lawsuit alleging that the two federal agencies has failed to comply with ESA and NEPA and also claimed that diversion of Laramie river water would jeopardize irrigation and wildlife habitat in Nebraska (Gaul 1993).

Grayrocks threatened some local Wyoming water users, Nebraska irrigators and hydropower producers, and environmentalists rising to the defense of critical whooping crane habitat. It also brought the newfound federal environmental agenda into the North Platte basin for the first time. When the powerplant was in the early planning and permit stage, members of several local Wyoming interests, Nebraska water organizations, and environmentalists gathered together and, for the first time in history, instead of fighting each other, found themselves on the same side opposing Basin Electric (Bethell 1986). Opponents argued that Basin Electric Power Cooperative had failed to consider the downstream effects and ignored everything beyond the Nebraska state line, including the needs of whooping crane habitat. The intent of local Wyoming opponents was to limit the size of the power plant in order to hold down the draw on local water supplies, and to constrain Basin Electric from letting any more water go downstream than necessary, as well as limiting the impact of the project on local schools, streets, taxes and the local environment (Bethell 1986). The intent of environmentalists and the state of Nebraska was to see that North Platte flows were not further diminished.

The situation came to a head when the state of Nebraska filed suit against the project, although the plant was already under construction. That lawsuit was joined by people concerned about wildlife, arguing that the project would further degrade crane habitat. For the first time, the weight of the ESA was applied to North Platte river water management. Because the ESA was still new at the time of the Grayrocks discussion, and the 1978 amendments of ESA had not yet clarified Section 7 procedures regarding takings, there was still a great deal of murkiness about the implementation of ESA. The Corps of Engineers argued that it did not have to consult under Section 7 because potential effects of Grayrocks Dam on endangered species were too far downstream.

The federal court ruled in favor of the plaintiffs and issued an injunction against construction of Grayrocks. Negotiations between the parties resulted in an out-of-court settlement that earned court approval. Basin Electric agreed to limit its water use, provide seasonal water releases from Grayrocks for downstream habitat, and establish a $7.5 million trust that would fund enhancement of whooping crane habitat to offset consequences of the power plant project (Gaul 1993). These funds provided the core asset of a new entity to speak for the birds and riverine habitat in central Nebraska–the Platte River Whooping Crane Habitat Maintenance Trust.

The Grayrocks episode established at least two important things. First, Wyoming water users were in a relationship with the FWS as it began to implement the ESA. Second, the dynamic had established an important new participant in basin water planning– the Whooping Crane Trust. The principal objective of the Trust has been to protect and improve habitat for whooping cranes, sandhill cranes, and other migratory birds on the 70 mile stretch of "big bend" Platte river Its funds could be spent to purchase rights to land, water, water storage, and for management of those assets. The Trust board consists of three members representing the State of Nebraska, Basin Electric Power Cooperative, and the National Wildlife Federation. The trust has acquired over 9,000 acres of land though through fee title purchase and easements.

Today the Whooping Crane Trust is an active, rarely neutral, participant in Platte River Basin planning. Out of this conflict at Grayrocks came a collective goods resource organization that had a mission to improve habitat, educate citizens, and promote the interests of the several listed species. Cranes, eagles, plovers, terns and other species do not much partake in the market economy and political debates; they had, therefore, been largely ignored. Now, they had found a voice, and that voice would be backed up by a multi-million dollar endowment and the Endangered Species Act.

CHAPTER NINE:
OPTIONS–INDIVIDUAL CONSULTATIONS, LITIGATION, OR NEGOTIATION

> "If every speaker who has talked in the last twenty years or so about federal-state relationships in water law was to be laid end to end, it would be a good and merciful thing."
>
> Charles E. Corker, 1972 (Pisani 1989)

The drafting of the U.S. Constitution was occasion for struggle with the vexed question about how to balance power as between states and the federal government. Federalism as a system of dual sovereignty was cobbled together on a fundamental principle. "The powers delegated by the proposed constitution to the federal government, are few and defined. Those which are to remain in the state governments are numerous and indefinite" (Madison 1788).

Federal Water Policy

Aridity in the West meant that the federal government, which had not paid much attention to the importance of water and systems of appropriation in the late 19th century, would be paying detailed attention in the late 20th century. Yet, federal policy has not been coherent. It has been made in an *ad hoc* manner with no agency of the executive branch or no committee of Congress keeping any kind of unifying vision. The discourses have been unhinged from any set of defensible guiding principles. Federal water policy has been characterized by competing agendas, agency turf-battles, protracted disputes, and an inability to provide policy views in any predictable manner (Rogers 1996). Federal water policies, having been a muddle for decades, prompted Congress to pass the Western Water Policy Review Act of 1992 (P.L. 102-575). This legislation directed the President to undertake a comprehensive review of federal activities in 19 Western states affecting the allocation and use of water resources—surface and subsurface. The Commission found there to be 15 federal bureaus and agencies with water related programs in the 17 Western states (of the lower 48), responsible to 6 cabinet departments, 13 Congressional committees, and 23 sub-committees and funded by 5 different appropriations committees (Western Water Policy Review Advisory Commission 1997). It is hardly remarkable that federal water policy has been characterized by costly confrontation, expensive litigation, delay, and uncertainty as to how potentially constructive problem-solving investments can be made.

Given that the "federal family" has not historically been particularly functional, Platte river basin negotiations would be challenging enough. But the basin initiatives were also tethered to regional social and political networks of influence that added their own impact–the sagebrush rebellion and the "wise-use" movement.

As state water user representatives were attempting to devise ways to work with new federal environmental mandates, at least some of their constituencies were organizing to challenge federal natural resource policy in general. Federal water policy became entangled with federal land and grazing policies, especially in light of how the Bureau of Land Management (BLM) began to change the manner in which it regulated federal land. Traditionally, water users in the West gained more from keeping lands in federal control as long as the BLM was kept politically subservient to their needs. Traditional users of BLM land had no more guaranteed rights to these

public assets than anyone else, but many ranchers and farmers depended for much of their revenue on easy unrestricted access to public BLM land as an extension of their private operations. Bankers and other market forces had capitalized low cost access to these assets into the valuation of their businesses (Andrews 1999). Any threat to their cheap availability would be energetically resisted by farmers and ranchers who were struggling for survival in an economy that was organized to extract the maximum from them while rewarding them minimally.

As the BLM undertook to implement its increased environmental mandate, and used its authority to begin to seriously constrain access to public land and water, the agency triggered a backlash among some Western public-land users who fought for continued access on the old terms. Those users organized a lobbying campaign—the 'Sagebrush Rebellion'—to intimidate the agency and reduce, if not stop, meaningful federal intervention in their traditional local control. A later smoother more sophisticated successor came to be known as the "wise-use" movement. It continued the fight for traditional uses of land and water free of significant constraint from federal agencies with environmental mandates. By the early 1990's the wise-use movement consisted of 600 property rights groups formed under an umbrella organization called "Alliance for America" (Nestor 1997).

When Ronald Reagan's administration took office in 1981, the President began to reverse much of the Carter administration's environmental advance. Reagan adopted much of the sagebrush rebellion agenda and placed leaders of the movement in positions of authority. With this shift, farmers, ranchers, and state water user interests were able to push back hard against the biologists in the Fish and Wildlife Service who issued biological opinions that favored "varmints" over people. They would attempt to build a coalition of forces that could "gut" the ESA and other environmental laws governing ranching, logging, and mining, but they soon found that more environmentally conscious congressmen from other regions would prevent overturning the United States' new-found environmental priorities. The subsequent George Bush administration moderated the anti-environmental priorities of the early Reagan years, but honored environmental priorities more by simple neglect.

During the course of the 1992 election, the wise-use movement divided its energies between George Bush senior and Ross Perot and thereby lost impact. William Jefferson Clinton won and, upon entering office, appointed strong environmental protection advocates to positions in the Department of Interior. But in 1994, in the elections of the 104th Congress, voters–especially in the West–sent to Washington anti-Clinton politicians who had no love for environmental agendas. The anti-Clinton–and in part anti-environmental–backlash had given control of the House of Representatives to a Republican majority for the first time in 40 years. Control of important Congressional committees shifted to a group of aggressively anti-environmental legislators. Over the next two years—1994-1996—conservative Republicans mounted an all-out assault on the center of environmental law that had been constructed in the 1960's, and 1970's. This produced Congressional log-jams and repeated Clinton vetoes, which sometimes all too narrowly derailed mounting efforts to overturn environmental legislation including the ESA.

The years leading to an eventual 1994 agreement to negotiate water issues in the Platte river basin–and the subsequent period of actual systematic negotiations between 1994-1997–were

years when the Clinton administration struggled to hold together a coalition that could preserve and protect the legacy of environmental legislation that had been constructed prior to the "Reagan revolution." There would have to be an emphasis on negotiation with water interests, collaboration, and a flexibility in posture that could adapt to local opportunities and constraints. It was important to demonstrate to environmental supporter and opponent alike that the ESA and other environmental laws could be administered with sensitivity and flexibility while still fulfilling their letter and spirit.

Somehow, a path would have to be created that would protect–if not enhance–support for the ESA, not erode it. Clinton's Secretary of Interior Bruce Babbitt sought to accomplish that feat while also finding ecologically viable solutions. From DOI's perspective, Platte River issues presented an opportunity to implement an emerging strategy for addressing the political challenges created by resource users opposition to the ESA.

Litigation Risks

Department of Interior authorities did not want to enter into litigation with the states over water rights for several reasons. In the first place, the FWS cannot directly intrude on state water rights systems—it can issue "biological opinions" that can be only enforced when environmentally aware citizens choose to file suit and succeed in getting a judge to rule in their favor. It is a system that forces environmentalist, not the federal government, to engage in the litigation process. Federal action agencies (e.g., FERC, Forest Service, USBR) must operate with the power they have—i.e., the power to issue permits and grant licenses for water facilities such as dams and river diversions. As they proceed through their decision-making processes, they, in turn, keep in mind positions and postures of the FWS, most especially as documented in its biological opinions.

Second, in the larger background of basin struggles over the application of ESA, a federal litigious approach to obtaining water in the West via application of federal reserved rights doctrine had, by the mid-1990's, proved to be a costly and time-consuming failure in the New Mexico Gila and Colorado Poudre river efforts. It was not entirely clear that the federal legal case was so strong that litigation would necessarily be counted upon to eventually deliver victory. Third, agency inflexibility and rigidity in a succession of attempts across the nation to enforce ESA mandates could erode political support and place the ESA and other environmental legislation in jeopardy. The ESA itself could be in peril if clumsy handling of the Act were to drive away congressional allies. Fourth, legalistic rigidity simply would drive away the very interests–local people, their organizations and their water knowledge--that must eventually be involved as partners in implementation of any solution. Fifth, federal action agencies–and additionally the FWS –simply would be overwhelmed by the burdens of individual Section 7 consultations that would be required in administering the ESA in a situation as complex as the Platte river basin. Finally, time and money spent on litigation represent resources that could be better spent on behalf of species. It is better to embrace local interests, educate them to their responsibilities under the law, get them on the agenda, and get on with the process of actually improving habitat.

Local water users in the Platte river basin were reluctant to litigate because they did not

trust a court—especially a federal court—to responsively consider water interests for multiple and conflicting uses. In the eyes of local users, a big difference between state water users and the federal government is:

1. state water users have had to deal with multiple and competing uses for decades and see water in the river as having many uses, some of which they like and some of which they do not;
2. with the obvious exceptions of the USBR and Army Corps of Engineers, federal agencies, such as the Forest Service and the FWS ,have not been historically involved in the river; and do not have a history of dealing with multiple and competing uses in local areas. They tend to see water as being dedicated to few uses, most especially the preservation of habit for endangered species. In this regard, the federal government is often viewed as having a narrow perspective on how the river should be managed. Locals therefore have argued that they must defend historical compromises and allocation arrangements on the rivers that federal representatives were all too willing to overlook.

Court litigation is an expensive gamble. The thought of legal minds reasoning from obscure precedent with all too little knowledge of the implications for delicately balanced water arrangements was all too scary. Judicial interpretations could easily carve water arrangements in technically, economically, and politically untenable ways. Also, states simply do not have the money for protracted struggle against federal agencies in long successions of cases. All-in-all court imposed "solutions" were to be feared more than anything the Fish and Wildlife Service could come up with in cooperation with local water users.

Babbitt's Collaborative Strategy

Many within federal agencies have long noted the need to move away from simplistic "command and control" approaches to environmental regulation, and toward more collaborative ecosystem management (Interagency Ecosystem Management Task Force 1996), (Ruckelshaus 1997), (Melious and Thornton 1999; Smith 2000). Given the sheer number of permit renewals to be processed, it was prohibitive to even contemplate an individual case-by-case approach in a complex river basin when no single user organization could provide the collective good that was needed, but each could muster allies in the struggle against constructive engagement with the problem of providing improved habitat. In the politically charged context created by the divisive struggle in the Pacific Northwest over old-growth logging in the domain of the spotted owl, and the broad regional "wise-use movement," Clinton's Secretary of Interior Bruce Babbitt developed an ambitious plan to abandon traditional command and control approaches to ESA implementation. Policy would consist of:

1. bringing U.S., state, and local governments and resource users together to build comprehensive local negotiated solutions;
2. making partnerships around large regional watershed strategies that would get ahead of the many crises that arose from sequences of isolated ESA consultations; federal authorities did not want to administer the ESA from an individual species perspective anymore than local users wanted to renew their water rights permit by

permit;

3. providing incentives to water users by:
   a. conducting multi-species consultations that could even anticipate subsequent individual species listings;
   b. craft a general road map so all would know what sort of action would be considered if re-initiation of consultations was to be required—to anticipate future reasonable and prudent alternatives;
   c. to give some assurance to participants that if they were to "sign on" to a recommended plan, they could obtain "regulatory certainty" over reasonable periods of time.

Playing the endangered species game had been costly and the stakes had been high. All parties had a need for accommodating the ESA. Collaboration and negotiation would do more for the species—and for preserving the ESA-- than litigation and confrontation. The real impetus for the Platte River Recovery program was to see how well Babbitt's plan to radically change the traditional approach to the implementation of the ESA would work. The political objective was to fend off attacks on the ESA directed at gutting it, if not repealing it all together (Echeverria 2001). The Platte basin negotiations have been all about whether or not the ESA can be implemented in a collaborative multi-species, multi-user, multi-state, multi-interest manner.

By the early 1990's then, many elements were in place. Private goods producers and common property water suppliers were caught up in federal relationships from which they could not extract themselves. To continue their activities, they would have to agree to negotiate a deal that promised to produce a set of collective goods–in the form of protected and improved habitats for listed species from which they would be able to gather no greater proportion of benefit than any citizen whose barely noticeable sacrifice was to be no more than payment of a tiny increased increment in water and power costs. Many beneficiaries would escape even that. Individually rational water users had a choice; they could have litigated and refused to come to the table. Yet, the workings of ESA under Bruce Babbitt and the DOI would bring those parties in the nexus to the table and keep them there. Yet, there is one major missing element this story–a sense of how a basin-wide cooperative effort could actually produce improved habitat

Assembling A Vision–The Platte River Management Joint Study

When the FWS issued, in 1983, a biological opinion that found the Narrows project on Colorado's South Platte River would impose jeopardy on listed species in central Nebraska, the repercussions could be heard around the basin. Water users were well aware of the multiple problems with Narrows, but many were by then beginning to see clearly that their hopes for federal permit renewals on existing water projects, and any dreams of new water projects, would have to somehow address needs for listed species habitat in central Nebraska.

Two agencies within the Department of Interior that, historically, had not got along especially well together, were at loggerheads over Narrows -the USBR, dam builder *extraordinaire* and the FWS, enhancer of wildlife habitat and custodian of the ESA. Clearly something would have to give. The status quo could not serve.

In this context, and viewing the post-Narrows administrative and political landscape, the Regional Directors of the FWS and USBR in 1983 initiated a Platte River Management Joint Study. Soon, in 1984, the Secretary of Interior was petitioned by water interests in Colorado, Nebraska, and Wyoming to be included (Study 1993). If federal authorities were going to be discussing the future of water use in their basin, state authorities and water interests wanted their voices to be heard. The result was establishment of the Platte River Coordinating Committee composed of the Regional Directors of the FWS, USBR, and water authorities from each of the three states. Soon working groups were established to undertake consideration of specific aspects of the basin-wide water use and listed species habitat agenda–e.g., species habitat needs, land and water management alternatives, research and habitat monitoring, public information and education, possible institutional arrangements, projected costs, and potential funding sources. Working groups were much more inclusive in membership than that of the core coordinating committee. They drew upon the talents, experience, and perspectives of environmental organizations, the Army Corps of Engineers, the Environmental Protection Agency, and a diverse array of local water users.

During the course of the remainder of the 1980's and early 1990's, study participants cajoled, wrangled, and battled over how to design a solution that could serve the requirements of the ESA, state appropriation doctrines, apportionments among the states made by Supreme Court decrees and an interstate water compact. They did their homework, consulted with their constituents, and struggled to frame a vision for addressing how the habitat needs of the listed species could be addressed while preserving water user interests. Most especially, they found inspiration in the upper Colorado river basin program for recovery of endangered fish species that, in those years, was underway by 1988 and was advancing under the watchful eyes in the Department of Interior. In May of 1993, the Coordinating Committee issued its draft report (Study 1993) that envisioned a basin wide habitat recovery program. Its work constituted an essential component of what would become a 1994 agreement among the three basin states and the Department of Interior to launch a cooperative habitat recovery program. The Joint Management Study Committee had set forth a preliminary vision–sketchy for sure. But it succeeded in anticipating how necessary habitat lands could be acquired, how water assets could be made available, a research and monitoring program, a budget, sources of funding, and it foresaw an organizational structure and a system of representative governance.

Agreeing To Talk

Arguments at McConaughy, Grayrocks, Wildcat, Narrows, Two Forks, and mountain reservoirs along the Colorado Front Range were made vociferously. Controversial draft biological opinions on the Arapaho/Roosevelt National Forest lands represented the first time that the ESA had been applied across state borders to existing projects in an effort to protect downstream habitat, and demonstrated the importance of basin-scale work But none of those individually costly struggles amounted to any kind of viable program–construction of a viable "reasonable and prudent alternative to shutting down the water operations that had created jeopardy for listed species. Conflicting and subtle forces were at work surrounding habitat issues entangled with disparate struggles over water proposals in the three basin states. This kind of high stakes and complex endangered and threatened species habitat game had to be very carefully structured. The Joint Platte River Management Study effort had provided an initial vision for

moving ahead. But how were the several actors actually to initiate negotiations?

Following the 1992 Clinton election victory, and installation of Bruce Babbitt of Arizona as Secretary of Interior, the new appointee desired to find a collaborative way out of what loomed as an impossible quagmire. He soon received a boost from a friend of the Clinton administration, then Colorado Governor Roy Romer. Mr. Romer was a leading figure in Democratic party politics and would serve as Chairman of the National Democratic Party. He had not placed environmental issues on his campaign agenda in Colorado, but after working on the problems caused by the permitting logjam on the Poudre river reservoirs, and following the Colorado Division 1 Court case, he could see the impossibility of the emerging situation. He then chose to be open to environmental arguments. Furthermore, he wished the Clinton administration well in its efforts to reform policy and practice in the Department of Interior.

Governor Romer conducted direct conversations with the Secretary and invited Mr. Babbitt to speak in Colorado where he would make a proposal for a comprehensive collaborative Platte River basin-wide negotiated approach to the problem. The Secretary felt a need to be in Colorado, among other things, for addressing grazing disputes. While there he breakfasted with water users at the Governor's Mansion. This soon led to a series of meetings involving senior office-holders and water users in all three basin states in 1993 and early 1994. Many were people with experience on the Platte River Joint Study who knew well the bitter aftermath of the collapse of Two-Forks in Colorado, the grindingly slow progress in the FERC discussions at Kingsley Dam, the scary possibilities that were being contemplated on Poudre upstream reservoirs, and Wyoming's stymied efforts to capture water for its own purposes–most especially Casper.

On June 10, 1994, an early draft agreement to talk systematically was signed by the Department of the Interior and the Governors of Wyoming, Nebraska and Colorado. Signatures were put to paper just one week after the FWS issued its biological opinion finding jeopardy for species in the operation of Arapaho/Roosevelt/Poudre river facilities. This first three-states-DOI agreement was only five pages long including the signature sheet, lacked much substance, and took much of what little detail it had from the Joint Study effort. But it made a critical point. Basin-wide collaborative negotiations would be undertaken. Governors of Nebraska, Wyoming, Colorado–and the Secretary of Interior–had made a commitment to building a Platte River Endangered Species Partnership that had two major objectives:

1. to develop and implement a habitat recovery program for four threatened and endangered species in Nebraska: whooping crane, piping plover, least tern, and pallid sturgeon;
2. to enable water users in the Platte basin to proceed with existing and new activities (as of June 30,1997) without additional actions being required for the four species. It allowed CNPPID/NPPD to comply with the requirements of the FERC interim re-licensing agreement by, for example, following the rules for a newly established environmental account at Lake McConaughy.

All parties agreed to work within existing frameworks of federal and state law. If the effort to construct a viable reasonable and prudent alternative were to fail, it was agreed that all biological opinions would be reopened. Negotiations would now proceed.

PART IV DOING IT TOGETHER

CHAPTER TEN:
ORGANIZATION OF NEGOTIATIONS

> "We need to recognize that adversarial, winner-take-all, showdown political decision-making is a way we defeat ourselves. Our future starts when we begin honoring the dreams of our enemies while staying true to our own."
> (Kittredge 1996 , p. 142)

The only way out of the painful impasse that had been building in the three states was to initiate basin-wide discussions to develop a collective program to serve as a reasonable and prudent alternative--an alternative to modifying or shutting down water projects that had been, or would be, found to be creating jeopardy for listed species. The years 1994 to 1997 would be a time when a general plan would emerge, strategies sketched out, and principles adopted. The problem was to convert the general intent of the 1994 Memorandum of Understanding into a workable 1997 Cooperative Agreement that could meaningfully point to actual construction of a defensible basin-wide recovery program.

Upon the signing of the 1994 MOA, the Department of the Interior's Assistant Secretary of Water and Science was appointed to lead the DOI's negotiation team and the Governors of each state appointed staff to represent each state's interests. As the participants found their way to the table, they recognized that, while the process was to be based on consensus, the discussion itself was forced by the ESA. The ESA provided the "bad cop" common enemy that the states needed. The states could not trust one another to fulfill their commitments, however, they could depend upon the ESA to act as a sufficient threat to insure that each party stayed honest and fulfilled their promises (Zallen 1997). Each interested party came to the table with historical animosities and preconceptions of each other, their own positions, as well as the policy requirements that they were there to satisfy.

Federal Experience

Negotiations were going to be challenging. The whole concept of basin-wide negotiations was experimental. Talks would necessarily: 1) be multi-jurisdictional within states (e.g., involving in Colorado the State Engineer's Office, Division of Wildlife, Conservancy Districts, mutual companies, etc.); 2) involve multiple interests within states (e.g., water users in the federal nexus and those who were not); 3) have to reconcile interests of three states with histories of antagonism; 3) pull together a family of federal agencies (FWS, USBR, and Forest Service) each of which had distinct, mandated, and highly political needs; and 4) mesh federal and state water agendas, something never before attempted in the basin.

Federal authorities knew well the central interests of actors in all of the large-scale collaborative restoration processes would be essentially the same (Luecke 2000):

1. federal regulatory agencies would seek compliance with applicable law and regulations;
2. state resource agencies would accept compliance within constraints of available resources and state resource user capacities;
3. resource users would seek certainty with respect to goals, burdens to be carried, and rules under which they would operate;
4. environmentalists would be most interested in a vision of habitat restoration not overly constrained by existing resource use patterns.

DOI had some experience and had devised at least a rough template for the ESA-driven negotiating process that had emerged over years of work in prior large-scale ecosystem restoration efforts, most especially those involving the Upper Colorado River. For example, the Upper Colorado River Recovery Implementation Plan was beginning to take shape by 1988. Some individuals involved in the Platte river negotiations had gained experience in the Upper Colorado, and the DOI hoped to use that experience with a process as a guide. By the time Platte river negotiations got underway, the Department of Interior had already forged the fundamental elements of a negotiation process within which the states and DOI could go to work.

The essence of the federal approach was to offer the promise of long term regulatory certainty for water users in return for states and water users willingness to fulfill species habitat needs, blend in the concept of milestones to be negotiated fulfillment of which would provide temporary relief during the negotiations, and demonstrate federal willingness to collaborate in a mutual learning process called adaptive management

Negotiating Dynamics

"There is always much need to reform other people's habits"
Mark Twain

After July 1994, a series of meetings along the I-80 and I-25 corridors of the three states (Cheyenne Wyoming, Kearney, Lincoln, Omaha and Grand Island, Nebraska, Denver, Colorado) took place. These sessions originally included only representatives from the DOI and three states. Representatives of federal agencies and three governors were in charge and imposed a rigid order to the proceedings. This structure included assigned seats for Federal and state representatives, with water user representatives and environmentalists sitting as an audience, away from the table. This frustrated and discouraged the water users and environmentalists, who were worried about their inability to communicate their concerns. As time passed, talks eventually expanded to include water users and environmentalists.

As the process dragged on for one year, than a second, MOA meetings were long, and many were tedious. The negotiations were tough, and often confrontational, involving emotional venting, and angry claims of injury. Representatives of host states would demonstrate solidarity with their constituencies by "grandstanding" (Zallen 1997). Nearly every term or condition put

forth was untenable to some important party, and at times the process seemed deadlocked. To many the whole effort seemed useless. But no party was willing to be the first to step away from the table. None wanted the dead body of a failed negotiation placed at its doorstep. Federal agencies were not always the "bad guys." Some of the most difficult issues were between states, and they met repeatedly without the DOI present to address inter-state problems.

Negotiations were open to the public. As discussions slowly showed some signs of progress more people thought them worth attending. At times meetings were witness to large gatherings–50 to 75 people crowding into rooms designed for considerably fewer (Ring 1999). It was then agreed to break into small work groups, and reduce meeting size to about 30. Overall, the negotiations were labor and time intensive; this was a problem because none of the parties had adequate staffing or funding to sustain their efforts. Federal and state budgets were limited, and in some cases even being reduced. Individual ranchers and farmers were at the greatest disadvantage, because they had no specialized assistance, no travel budgets and found it difficult to participate in busy spring, summer, and fall growing seasons. Constrained resources, however, created more than complaint; they also were the source of pressure to get serious and make a deal. However, representatives of the several interests knew that the price of acquiescing to a "bad deal" would be to have their head handed to them by their own constituencies. For all parties, regulatory certainty was paramount, but everyone wanted that certainty on different terms.

Early negotiations were frequently filled with assertions to the effect that the whole effort was futile given constraints of law, the Colorado-Nebraska interstate compact, Nebraska v. Wyoming litigation, and the fact that small streams of water disappear quickly into the sandy river bottoms of semi-desert high plains. Old antagonisms led to charges that the program was in fact a conspiracy to deliver more water to irrigators in Nebraska, so they would eventually agree to share some of their water for habitat purposes. Some water users alleged that federal agencies were simple opportunists who targeted water in high mountains not because it made any sense to do so, but–reasoning that the water was too far from the critical habitat in Nebraska to justify re-regulating–the FWS simply wanted to extort without a larger justifying plan in mind (Zallen 1997). Users also made the argument that Federal agencies were simply attacking state prior appropriations doctrine in an attempt to wrest control away from the states.

Early on, Colorado used the South Platte compact as a shield from the impacts of the ESA, by holding that Colorado simply did not "owe" more water to Nebraska. Colorado asserted that it merely had to deliver the amount stipulated in the compact. Other Colorado objections to the MOA included concerns that water released from high in the headwaters would never make it all the way to Nebraska habitat, but would instead be diverted by surface water users in Colorado and Wyoming, or by groundwater users in Nebraska operating entirely within state law. States were fond of pointing out that hydrological data that revealed that, in periods of low flow in the basin. heavy rains that created floods in one reach of the river or a tributary had been entirely absorbed into river banks and floodplains in near downstream reaches. For example, the largest recorded flow on the South Platte main stem could not be detected as an increase in the central Platte's flow at Grand Island (Dreeszen and Bentall 1993). But, in the end, water users in each state needed federal permits and that harsh reality had brought each of them to the negotiating table and would keep them there.

Moderates and Rejectionists

Babbitt's attempt to push a collaborative approach to demonstrate that the ESA could be wielded with sensitivity and openness to local creative solutions in ways that drew people together would prove to split environmentalist and commodity producer constituencies alike.

In the environmentalist camp, some would want the ESA to be employed as an uncompromising legal hammer, not an invitation to negotiation with despoiling devils. Collaboration would allow developers, industrialists, agriculturalists, and extractive industries to construct a path around ESA requirements. Environmentalists had to confront their big strategic choice:

1. work within Babbit's framework of negotiations, which would mean making compromise with coalition partners, an acceptance of certain things as given, and working solutions out within the parameters established by the coalition; or
2. work outside the framework of negotiations, staying "pure" and being prepared to challenge any given negotiated outcome in court. This means a sacrifice of local knowledge that comes with getting to know your opponents and allies, and a sacrifice of getting something positive done on the ground sooner rather than later, if at all.

The question became: "When is it time for environmentalists to be divisive holdouts, and when is it time to enter the fray, cut deals, and help get something done on the ground even if it is not perfect?"

From the perspective of the environmental community, the Platte river recovery plan was a new type of negotiation. Denver's Two Forks project proposal had been a case where environmentalists and their allies were closely aligned–they were unequivocally against it. Fighting the devil embodied in the form of a large storage project was a people recruiter and money raiser for them, and their task was simple–oppose it forthrightly. However, in the case of Platte basin negotiations, the issues were less clear-cut, and positions, depending upon constituencies and organizational mission, were much more complex. Many actors with various agendas yielded no clear opponent, and each interest had to be considered as at least somewhat legitimate. This meant the all parties had to seek a middle ground of tradeoffs and work with opponents in order to accomplish anything.

Some environmentalists saw the FWS as too willing to compromise, thereby weakening the intent of the ESA and unduly risking species survival. They noted what they considered the infrequency of jeopardy findings, and declared that compromise and negotiated settlements that promised scientific-sounding activities, such as "conservation," "research," "monitoring," and "stocking," were inadequate to insure survival of species (Wood 1998) (Sax 1999; Sax 2000). Collaboration was seen as risking the surrender of national interests to local interests, and would allow resource users to retain too much control of what they have always had. Such voices held that it would be better to stay remote, uncooperative, and force issues through courts. Such arguments have led to deep rifts between those more moderate representatives who favored negotiated solutions, and those deeply suspicious of both the process and the outcome.

Environmental Organizations

The Platte River Whooping Crane Habitat Maintenance Trust (the Trust), was funded with monies provided by the Wyoming Grayrocks settlement. Using litigious means, and the threat of such means, as a lever, the Trust was active in the thirteen year controversy over the FERC re-licensing of Kingsley Dam and also strongly advanced environmental interests in the conflict between Wyoming and Nebraska over division of North Platte river flows. It would become an important environmental player in the Platte river collaborative process.

The National Audubon Society was originally incorporated in 1905 in New York to stop the slaughter of birds for millinery commerce. After that success, the Audubon Society continued to advocate for wild birds, and by the mid-1990's had a staff of 300 employees and 570,000 members. Audubon has had a long history of lobbying for state and federal protection of habitat and has developed its own system of about 100 bird sanctuaries. Audubon became interested in the status of the whooping crane on the central Platte in the 1940s. By the 1970s, the society became involved in a series of discussions about water diversion and storage proposals, and by taking legal action to protect riparian habitat. In 1973, the society purchased 782 acres of pristine crane habitat for a sanctuary along the Platte east of Kearney Nebraska. Additional acreage has been purchased since, and cooperative agreements have extended protections beyond the sanctuary. The society was active in the re-licensing of Kingsley Dam, and became an important force in Platte river recovery negotiations.

Environmental Defense (up to 1999, the Environmental Defense Fund) was originally incorporated in 1967 by a group of Long Island conservationists to ban the use of the pesticide DDT. This organization, by 2001 had 300,000 members, a staff of 234, including scientists, ecologists and attorneys, and an operating budget of nearly $43 million. The Environmental Defense Fund has promoted the idea that a healthy economy and a viable natural environment are not mutually exclusive. Environmental Defense played an active and important role in negotiations up to early months of 2002 when the organization announced a reallocation of its assets, a review of its priorities, and withdrew its representative from the negotiations. After the withdrawal of Environmental Defense from the process, the National Wildlife Federation would step forward to occupy a lead role.

The National Wildlife Federation (NWF) has been one of the largest, oldest, and most active of environmental organizations. As the "General Motors" of the North American environmental movement (Shabecoff 2000), it has been a major force for environmental causes across the U.S. landscape. It had annual budgets, in the late 1990's, in the range of $100,000,000 and almost 2,000,000 members not to mention several more million supporters. The NWF has been involved with bird habitat–most especially for whooping cranes–for decades before the basin-wide negotiations were undertaken. A local representative in central Nebraska would step up and fill in for the departed Environmental Defense representative by mid-2002.

Essentially, the story of environmentalist participation in the Platte basin negotiations after 1994, was that environmentalists were invited into the talks by DOI, experienced a split along ideological lines, two organizations would leave the discussions but would return, and they continue to keep an important presence in the collaborative process.

At first, environmentalists were fearful that they were having too little impact on the MOA process, and that their presence was an implicit endorsement of the process at a time when it was unclear that there would be sufficient concern about species and their habitat requirements (Ring 1999). In early 1994, in discussions with the three states and the DOI, environmentalists had no well defined standing and no vote. But senior administrators in the Department of the Interior were friendly to environmental voices, and made certain that representatives from the Whooping Crane Trust, Audubon, and the Environmental Defense Fund did attend. Eventually, DOI was able to arrange for environmentalist representatives to be considered full members, with voting rights. The time would come when the three organizations would share two votes on the Governance Committee that was to be birthed in the June, 1997 Cooperative Agreement.

Environmentalists had participated in talks throughout 1994, 1995, and well into 1996. Given scarce resources in the environmental community, an agreement had been made to divide tasks as between the people of the Audubon Society and those of the Environmental Defense Fund. Roughly, Audubon would focus its attention heavily on the Platte River negotiations freeing up Environmental Defense Fund resources to be applied on other pressing issues in the West. Environmental Defense would maintain an interest in what the Fund considered an important priority, but would defer to Audubon on Platte Recovery Program negotiations. However, at one point in late 1996, the Whooping Crane Trust and Audubon decided to abandon the Platte river process because they did not believe that the water users were open to their concerns, or took them with sufficient seriousness. One disaffected representative of Audubon who left the table not to return later wrote that it should be a matter of no small concern that Platte basin negotiations could be proclaimed as the model for environmental planning in the future–a "worst possible outcome"(Echeverria 2001). This decision, on the part of Audubon, compelled a quick change of Environmental Defense priorities and the EDF returned to the table.

The issues at hand that drove the split and walk-out revolved around the controversial 417, 000 acre feet proposed target flow in the biological opinion on the whooping crane, the handling of land objectives, and the status of the Platte river discussion relative to those with FERC at McConaughy. The highly contentious target flow figure was at the very center of negotiations and had to be addressed. The states were adamant that the proposed target flow was all wrong and totally unjustified. The FWS saw fit to divide that amount of water into more manageable chunks–with the first 10-13 year program increment proposed quantity to be in the range of 130 to 150 thousand acre feet per year. The FWS willingness to step back from its 417,000 target flow figure, kept water users in the negotiations, but environmentalists were divided in their reactions. Some wanted to stay at the table, debate the amount of water, and remain positive about the direction of negotiations. Others were concerned that the biological opinion not be compromised up front (Ring 1999). In addition, there was division over the wisdom of allowing the FWS to compromise on the matter of land habitat acreage The original biological opinion specified a target of 29,000 acres and the FWS was prepared to break that figure down into thirds, setting 10,000 acres as the target for the first program increment. That concession was not well received by some in the environmental camp. Furthermore, the Audubon representative who left the discussions had been deeply invested in the FERC re-licensing negotiations and felt that process was bearing fruit. When Secretary Babbit and Governor Romer initiated the MOA process, it seemed to this Audubon representative that energy and focus was being diverted from a possible success within the FERC framework. Superceding the FERC process was not welcome.

The Audubon Society representative determined that, because of ideological and methodological differences, it would no longer be constructive for all environmentalists to work together due to deadlocks that had emerged among them. For some, then, who saw little room for compromise, and who had difficulty with the idea that a new set of negotiations would replace those focused on FERC re-licensing, it was all too much. For them, it was time to walk.

However, some environmentalists felt strongly enough about the merits of the process that they either never left or soon returned to the table, most especially the representative of the Environmental Defense Fund. One element attractive to these environmentalists was that the Cooperative Agreement that was being forged at the table for signing in 1997, clearly laid down an environmentally desirable policy–no new depletions on the Platte could be made without full replacement. That alone was a compelling reason to continue with the negotiations. Another reason to stay engaged was the larger political and ecological issue of landscape-level planning, something that the FERC discussions could not deliver. Nebraska alone could not be expected to satisfy the needs of cranes without the contributions of upstream states Colorado and Wyoming that had the watersheds. None of the three states could achieve the essential habitat improvement goals alone. Scientifically and politically, basin-wide planning was critical to habitat restoration. The basin encompassed the important actors as well as the options of a large area and many different access points for change. The Platte river negotiations gave environmentalists what they needed and were not likely to get any other way–basin-wide effort.

When Whooping Crane Trust and Audubon representatives stepped away from the table in the summer and fall of 1996, the Environmental Defense Fund was left without its coalition partners. Its representative became concerned that the walk-out risked unnecessarily alienating DOI, particularly in light that agency's relatively recent efforts to assure full membership status of environmental representatives. Furthermore, the walk-out threatened to throw away a golden opportunity for basin-wide water re-regulation. Meanwhile DOI authorities maintained linkages to the walk-outs. Later, in the spring of 1997, representatives of the Whooping Crane Trust and other delegates of Audubon would return. They knew that a Cooperative Agreement was being forged and would likely be signed by mid-1997. It was better, they calculated, to be party to the deal and help the program work. After all, they had already won no small victory. The nature of the debate had changed in the Platte basin. It was no longer about defending the old status quo. Discussion was now about how to re-organize water flows, replace any new depletions, acquire terrestrial habitat, work out program monitoring plans. It was all about species recovery. In the final analysis, environmentalists who stayed at the table had a hand in an exciting new agenda and they still had the ESA as a backstop–the DOI and the states could not sell away the environmental agenda too much if sharp-eyed environmentalists were close to the process and were always capable of exercising their litigation option.

Agricultural Water Users in Opposition

Many agricultural water users also questioned the wisdom of entering into basin discussions. Their discontent emerged soon after the 1994 pact was signed, but erupted most strongly soon after launching the 1997 Cooperative Agreement. Opposition of agriculturalists was different from that of the environmentalists in that, whereas the environmentalists were divided over whether or not to be at the negotiating table, agriculture had its representatives at the

table. Governors of the respective states saw to that. Rejectionists in the agricultural water user communities stood in opposition to what they feared their representatives would agree to do. They became most vocal and disruptive in 1997-1999 after the MOA was signed, after a Governance committee and its advisory committees had been established, at least on paper. Their story will be at least partly addressed in Chapters 15 (science and junk science) and 16 (land habitat). Despite the presence of rejectionists in each of the camps–water user and environmental-- the collaborative process was beginning to work The Babbitt and Romer initiative that led to the 1994 agreement to talk was beginning to create a de facto coalition that could hope to provide and manage resources in the critical habitat over the long run.

Sideboards, Milestones, and Relief From Jeopardy

By March of 1995 the negotiations had produced a preliminary vision built upon the preceding Platte River Joint Management Study, a rough outline of how a negotiated solution might look (U.S. Fish & Wildlife Service 1995). Referred to as the "Sideboards Document" it envisioned ESA implementation in a fair and scientifically sound manner, emphasized the use of collaboration in adaptive management, and a comprehensive multi-species approach. It kept the negotiators together, established a history, a justification for talks, and a vision of a direction that negotiators could follow and share with their constituents. The sideboards statement provided an essential vocabulary of concepts that would serve negotiators in the years to follow, defining principles for expenditure of federal funds, financial protocols, adaptive management, a route to the construction of a reasonable an prudent alternative that would provide quantities of land and water, and stipulated some essential milestones to be fulfilled, a list of issues yet to be negotiated.

Milestones embodied the concept of "sufficient progress" as defined and required by the FWS. As a central component of adaptive management, milestones represent systematic checks on progress, allow adjustment for unforeseen circumstances, and create incremental goals that bring the process closer to the objective–i.e., construction of a viable reasonable and prudent alternative. Milestones would be assessed year by year, state by state, and organization by organization. If sufficient progress was not in evidence, the FWS could threaten to withdraw relief from jeopardy, and re-open any biological opinions that had been issued. Milestones would be negotiated, and employed, in the domains of water, land, research and monitoring, and program governance and administration.

A significant concern for states and their water users centered on the possibility of not fulfilling a milestone due to circumstances beyond control, and the resulting consequences of that failure. For example, if budgets and market conditions would only allow acquisition of a portion of required land for habitat, how quick would the FWS be to withdraw the promise of regulatory certainty? Essentially, the FWS service walked a fine line between reasonable flexibility in an uncertain world and tough holding to expectations that would induce good faith efforts to push ahead. The FWS mantra was lets talk, make milestone commitments, evaluate, discuss options, and adjust milestones as compelling lessons were learned. FWS personnel pointed to examples of agency reasonableness in other collaborative efforts–e.g., on the Upper Colorado where milestones had been adjusted and new ones created in an effort to deal flexibly with previously unanticipated problems (Morgenweck 2001). Adaptive management and fulfillment of milestones became two concepts closely allied as negotiations progressed.

Eventually the FWS promoted constructive discussion by calling for and collaboratively arranging workshops every few months. Small groups representing the several interests met to define problems, do homework and envision solutions, and then feed proposals into the workshops. A basic dynamic was repeated across the years:

1. members within each network (each of the three states, the Federal interests, and environmental communities) would consult, sort out issues amongst themselves. Within networks, home coalitions had to be constructed;
2. states, after building a coalition and strategy, could then talk with the other states, and environmental groups could share with other environmental groups;
3. only then could each network work with other parties at the committee level. As issues and positions emerged, members of each network would retreat to reconfigure their positions as new information and opportunities would arise. Virtually all participants were busy with other regular responsibilities in their organizations, and the work of building networks and developing and modifying positions would require extended time and commitment.

Because negotiations were, and are, constructed out of these many conversations within and among the sub-networks, leaders could not simply sign documents and expect successful outcomes. Collaborative efforts, by their very nature, are slow because leaders must build coalitions in order to retain support of players who are there voluntarily. Rushing the process too fast risked neglecting the creation of strong actionable coalitions. Slacking off too much simply invited delay. The solution was to meet monthly and push as hard as possible, backing off in the face of protest of hard pressed people.

Target Flow Challenge

Between 1994 and 1997, the biggest single substantive challenge for negotiators was finding a way to deal with the FWS judgment, in its biological opinion, that the history of water diversions in the Platte river basin had shorted the critical habitat of an annual average of 417,000 acre feet of water flow. Negotiations threatened to flounder on the question as to whether that estimate was justifiable. For its part, the FWS could not play fast and loose with its biological opinion that was at the basis of the entire basin discussion, and water users were not about to accept such a number or the analysis that had generated it.

The FWS insisted that much water be re-regulated on behalf of the ESA agenda, and water users insisted on obtaining regulatory certainty without promising anything close to the FWS target flow. The question was how to cut through the impasse over target flows to clear a path toward construction of a "reasonable and prudent" alternative. The Fish and Wildlife Service's objectives centered around using enhanced river flows to recover presently listed species, to prevent future listings of additional species, and to provide sufficient habitat for conservation of the natural biological ecosystem. A team of people representing the Fish and Wildlife Service and the National Biological Survey had created a table of target flows that cumulated into the 417,000 acre foot estimate based on an assumption that inadequate stream flows, and most especially the lack of peak and pulse flows were the most important limiting factors in the Platte River Basin ecosystem. Therefore, quantities of water must be enhanced by

an annual average of 417,000 acre feet.

Re-organized water quantities would be required to recover critical habitat components including channel roosting habitat, wet meadow habitat, sandbar nesting habitat, fishery habitat, and foraging habitat. All these components were seen as essential for recovery of all federally listed species and over 300 migratory bird species in the Central Flyway. The Fish and Wildlife Service held that flow conditions on the Platte River affected the habitat components directly. Re-regulated flows would recover damaged habitat, prevent the need for listing additional species, and provide for conservation of the natural biotic ecosystem components.

The FWS identified pulse flows as the highest priority. They were viewed as essential to maintain and enhance the physical structure of wide, open, unvegetated and braided channels, to supply soil moisture and pooled water during the growing season for plants and animals lower in the food chain in meadow grasslands, to rehabilitate and sustain biologic webs in main and side channels as nursery habitats for fish, shellfish, and other aquatic organisms, and to facilitate nutrient cycling in floodplains. Pulse flows also raise groundwater levels in wetlands adjacent to rivers and bring organisms close to the soil surface for predation by migratory birds and other species. Pulse flows contribute to the break-up of winter ice and thereby induce the scouring of vegetation off sandbars, which is especially important in years of low flow. Except for the driest of years, at least 50% of the pulse flows should occur during May 20-June 20 and should emulate traditional flow patterns of 10 days ascending, 5 days cresting, and 12 days descending (U.S. Fish & Wildlife Service 1997a).

To accomplish all this, FWS biologists and hydrologists called for an average annual reduction of shortage to the 417,000 target flow at Grand Island, Nebraska. Target volumes were categorized by dry years, normal years, and wet years. Decisions for what kind of year managers would be facing were expected to be based on estimated gross water supply, plus estimates of groundwater and precipitation, and snowpack in the entire basin (Bowman 1994). The quantity of 417,000 acre-feet of water was calculated using actual flow patterns from 1943-1994. Target flows were calculated by looking at days when flows were short of the desirable standard as defined by the FWS, the differences between the observed and desirable were averaged, and then cumulated into the over-all target flow value.

Water users did not agree with the numbers presented by the Fish and Wildlife Service's biological opinion. They believed that 417,000 acre-feet of water for habitat recovery was not based on logic, history, or even river capacity. In the often heated discussion of target flows, even basic facts about the physical structure of the river could not be agreed upon, especially the most crucial element, which was how much water would actually be required to restore and sustain habitat for the listed species. The Service was fixed on its biological opinion and its target flow analysis; there was no way that the agency would negotiate away the very analysis that had been the basis of its jeopardy opinion. But water users vehemently rejected the analysis. Target flows had become non-negotiable, and threatened to bring prospects for a negotiated river basin solution to a screeching halt.

Some path had to be found to keep talks from completely floundering. The way out was found in the concept of "adaptive management." An agreement was reached that allowed water

users and states to reject the federal "target flows" analysis while the federal government held to them, and thereby protected its biological opinion. Adaptive management allowed all parties to make peace–not around any agreed target flow number–but around the idea that collaborative work, research, and monitoring over the duration of the first 10-13 year program increment would allow all parties to determine actual species needs. This mutual commitment to adaptive management allowed all parties to get past impossible target flow discussions by agreeing to disagree about target flows. In the end, the Department of Interior would accept a 1997 Cooperative Agreement that would call for first program increment average annual reduction of shortage to target flows of 130,000-150,000 acre-feet. The agency would, thereby, retain its biological opinion as an uncompromised policy document. If the first increment water objectives were fulfilled and the volumes were found to be inadequate, DOI could always ask for more under the terms of the original biological opinion that had launched the search for a program. Meanwhile, the talks were back on track.

1997 Cooperative Agreement–Essential Elements

> "The enduring challenge for American environmental policy, in short, is to build and maintain public support for effective governance of the environment: for managing the environment by managing ourselves"
>
> (Andrews 1999)

On July 1, 1997, the Secretary of the Interior and the Governors of Colorado, Wyoming, and Nebraska entered into an agreement, called the "Platte River Cooperative Agreement (CA)." The parties agreed to negotiate a program to conserve and protect the habitat of four species listed as endangered and threatened under the ESA. The CA was almost 150 pages long and included several documents:

1. a milestone document describing obligations of the parties during the three year Cooperative Agreement period (1997-2000);
2. a water conservation/water supply document, describing studies needed to develop water for program purposes;
3. the proposed program, describing water supply and re-regulation projects to provide water to the habitat, and land, money and other contributions by the states and DOI; and
4. a governance document.

The three year Cooperative Agreement period (1997-2000) would be employed to: 1) complete negotiations of yet unresolved issues pertaining to land, water, research and monitoring and 2) provide time for a USBR-EIS team to assess the proposed program as required by NEPA, and 3) provide opportunity for the FWS to evaluate the emergent program for sufficiency as a reasonable and prudent alternative. Assuming that all of this would be accomplished by June 30, 2000 (a provision had been made for possible extension to December 31 of that year and that provision would be exercised), a viable program would be launched in its first increment of 13 years. The FWS had advocated a ten year first increment while states held out for 15 years to fulfill goals. The compromise was to provide13 years for the first program increment. Water users would enjoy regulatory certainty by fulfilling milestones to the satisfaction of the FWS and DOI..

The Proposed Program would extend indefinitely, but be implemented in increments. After successful completion of increment one, the parties would negotiate the terms and conditions of the second and subsequent increments. The FWS mandate is to review matters as the program moves to the conclusion of the first increment, if necessary negotiate amended terms and conditions for the future increments, or even reopen consultations if the program has seriously broken down.

The Cooperative Agreement pledged the states and their water users, in the first 13 year program increment, to acquire, protect, and restore at least 10,000 acres of terrestrial habitat and to re-regulate basin waters so as to reduce shortages to average annual FWS target flows (i.e., 417,000 acre feet) by 130,000 to 150,000 acre-feet as measured at Grand Island, Nebraska.

By 1997, water users in the three states had sketched out three sources of program water that the FWS would eventually find to cumulate to an estimated average total of about 80,000 acre feet/year. Nebraska's contribution would come from an environmental account established at Lake McConaughy. That account would be served by water inflows equal to 10% of the storable natural inflows to the lake in the months of October through April up to a maximum of 100,000 acre feet (Agreement 1997). Wyoming's proposed Pathfinder dam and reservoir modification project promised to increase storage by 54,000 acre feet. About 34,000 acre feet of this increased storage would also serve the environmental account Lake McConaughy. The remaining 20,000 acre feet would be held for Wyoming municipal uses. Colorado constructed what came to be known as the Tamarack Plan (after an old ranch by that name) designed to produce an annual average yield at the Colorado-Nebraska state line of 10,000 acre feet via groundwater recharge that would generate return flows to the South Platte at times needed for recovery of species habitat. The difference between what these sources could produce as an annual average (i.e., about 80,000 acre feet) and that necessary to get to the first increment goal of 130-150,000 acre feet, would be found during the cooperative agreement three year period by a $900,000 state funded water conservation and supply study.

In addition, each state pledged to construct a future depletions plan by the end of the CA period (then expected to be either June 30 or December 31, 2000). Any new depletions placed by water uses upon the river would have to somehow be replaced–whether or not the depleter was in a federal nexus. Total program costs were then estimated to amount to $75,000,000 to be split 50:50 between the three states on the one hand, and DOI on the other. State contributions were calculated in a combination of cash, land, and water equivalents. States settled on a 40/40/20 percent share of their half of the total cost:

1. $15 million by Colorado--$10.8 million in cash and cash equivalent, and $4.2 million in contributed value of water from the Tamarack Project;
2. $15 million by Nebraska--$5.3 million in land (10,000 acres), $9 million in contributed value of water from Lake McConaughy, and $700,000 in cash and cash equivalent;
3. $7.5 million by Wyoming--$4 million in cash and cash equivalent, and $3.5 million in contributed value of water from the proposed enlarged Pathfinder Reservoir;
4. $37.5 million by the federal government in cash.

Each of the states would develop its own program in a manner that would reflect its unique opportunities and constraints. For existing water projects, in place prior to July 1, 1997, as long as the milestones of the CA period and of the first increment of the program were met, the evolving program would serve as a reasonable and prudent alternative. That, in turn, would provide regulatory certainty to water suppliers.

In the end, everyone could see the advantages of pursuing the construction of a collaborative recovery program within the framework of the Cooperative Agreement. The federal government got a path to improved flows and restored habitat and effective working relationships with water interests in the three states. The ESA would be served. The water users and the states stood to gain regulatory certainty and secured means by which land and water acquisitions would be forthcoming on a willing seller/buyer basis. Nebraska got re-licensing of Kingsley Dam. Wyoming would get a 40% portion of additional storage to be made available at Pathfinder. Colorado got a path to its needed permits for its headwaters projects and city water facilities. All parties saw benefit from the avoidance of an impossible permit by permit approval process. And all existing water users with priorities up to June 30, 1997 were protected by the program as long as it remained viable. States were served by the FWS agreement to set aside its 417,000 acre-foot target flow at least during the first increment, in favor of a mutual learning and adaptive management program.

1997 Cooperative Agreement–The Road Ahead

The July, 1997, Cooperative Agreement was far from perfect in the view of any negotiator but it framed a potentially livable future. Alternatives were even more frightening. Opponents could rail away against the negotiations but they all had one critical attribute in common–none thought they were in need of federal permits. In the next three years (1997-2000) the MOA proponents would set about the task of converting the general vision of July 1, 1997, into a viable reasonable and prudent alternative that could win the support of the state and environmental players and of the Department of Interior. The several strategic pieces of a proposed solution appeared to be coming into alignment.

The next three and half years (July 1, 1997–December 31, 2000) would witness the putting together of a plan to supplement the 70,000-80,000 acre feet/year already identified at Wyoming's Pathfinder reservoir, Nebraska's Lake McConaughy, and Colorado's Tamarack with another 60-80,000 acre feet; people in the process would see issues hammered out for acquisition of habitat and its management, and negotiators would grapple seriously with the fundamentals of measuring progress toward defined program goals.

Negotiations up to 1997 had established precedents that took water users and state authorities well beyond their comfort zones. Every perspective constituted a platform from which complaints were launched. Wyoming and Colorado users, especially, lamented that the Bureau of Reclamation had betrayed its original mission and changed their universe; Nebraska groundwater users complained that the two districts operating at Kingsley dam were securing their permits at the cost of dragging them into a discussion with water policy makers in Lincoln and with federal authorities of which they wanted no part. Colorado users expressed fears that an

implicit federal junior water right was taking form to serve the recovery program that would somehow reorganize at least some lower South Platte river flows in a manner that would impose disadvantage on senior rights. Federal negotiators complained that whereas they had displayed flexibility in dealing with target flows, had broaken down the desired 29,000 acres of required habitat into parts, and had proffered a philosophy of adaptive management for working things out over the years, they received all too little appreciation from states' representatives who appeared to be dragging out discussions in what appeared to federal negotiators be a stalling game. Environmentalists fretted about danger that the federal negotiators would cut environmentally unprincipled deals to make coalitions with users that–in saving the Endangered Species Act in Washington, D.C.--would gut it on the high plains.

Big issues would have to be wrestled into viable compromises. How would the parties find additional water to supplement that which was already pledged to get to something in the range of 130-150,000 acre feet per year? How would they determine fair shares of water contribution, move re-regulated water to critical habitat, define habitat acquisition and management principles, hold to a steady baseline of river flows in a basin where for more than a century forested watersheds were thickening, absorbing and evaporating greater amounts of moisture in the headwaters and in the main channels, deal with the challenge of preserving and enhancing spring pulse flows, and figure out ways to re-pay the rivers for any "new" depletions that users would impose on and after July 1, 1997 and resolve issues of water allocation among the three states that would be considered under the rubric "regime of the river."

Can the Federal Regulatory Agencies Ever Be Partners?

An important sub-text running throughout negotiations has been a big question: what are the terms and conditions of collaboration? On one hand, the states desire full partnership and maximum possible influence on the direction of discussion. Yet, on the other hand, DOI–the FWS in particular--holds the trump card, the capacity to grant, or withdraw, regulatory certainty. No amount of sensitivity or good will in building a relationship with representatives of the basin states can gloss over the fact that federal authorities will decide if, and when, the requirements of the ESA are being met. The relationship is not among equals. Federal authority to implement the ESA cannot be negotiated away or delegated to the recovery program's Governance Committee. The FWS ultimately will to determine success or failure. Like any subordinate party, states would rather flee the relationship. But since they are firmly in the grasp of the ESA, states seek assurance that federal authority will be employed responsively and predictably. States have feared federal arbitrary and capricious action. They feared deals made, and understandings achieved, will be tossed aside by changing politics and managements in remote Washington, D.C. They feared opening their wallets and water accounts on an open-ended playing field where the other player is also the judge.

The Federal Case

Federal authorities have contended that they have demonstrated good partnership values in the negotiations leading up to the 1997 Cooperative Agreement and thereafter. They were flexible in the handling of target flows (setting aside the 417,000 acre-feet figure to accept a reduction in shortage of 130–150,000 acre-feet during the first increment), and by reducing the first increment

land requirement from 29,000 acres of land to 10,000. The federal government has also committed itself to an adaptive management strategy that is founded on a learning model designed to respond to emerging problems. Mutual learning, using the best available science and management practices, is open to state and water user contributions and critique.

It is true that the FWS must retain final authority to implement the ESA and cannot let its authority to be negotiated away. Only federal authorities can determine what is, or is not, acceptable as a reasonable and prudent alternative. Judgment of "sufficiency" is a complex enterprise and two DOI dynamics are simultaneously at work. First, there is the on-going negotiating dynamic within which it is only sensible for FWS leaders to "make deals" in good faith as they apprehend opportunities to advance toward serving species habitat needs. Yet, there is tension in so doing; there can be–at any given point in the negotiations–no pre-judgment of eventual proposed program sufficiency. There was no way that the Cooperative Agreement could promise that any proposed program, once constructed, would necessarily be found to be "sufficient." Doing "deals" at the table are one thing. Finding any proposed program to be sufficient is quite another. Therefore, there is a second DOI dynamic that centers on conducting the best possible NEPA and ESA analyses. Only upon completion of these evaluation processes, can the authorities make a finding of program sufficiency (or not). If all this creates uncertainty among resource users, there is little alternative but to press on. There are inevitable tensions here for all parties.

However, the FWS has signed on to the cooperative agreement in good faith as a partner in need of authentic collaboration from the states and local users. The FWS can not in isolation design a solution and could not implement any solution that it could design. States should set aside their fears and accept an on-going partnership in the Platte river basin.

The States' Case

> "What's mine is mine, and what's yours is negotiable."
> Local water users' opinion of federal negotiating posture.

The states displayed a lack of trust in federal government negotiating strategies and courses of action. The federal government, many state participants have contended, had been repeatedly obstinate, arbitrary, capricious, and disrespectful of thoughtful argument from the water user community. Examples will be discussed in following chapters.

The most fundamental problems had been centered on the status of the FWS in the negotiations. When the FWS took the lead in putting together a document, was it just doing staff work for others at the table that would be open for full discussion among equals, or was it laying down policy? State water representatives, and sometimes even environmentalists, got the feeling that FWS was handing down fiat not to be seriously questioned by others. To the extent that water users and environmentalists felt they were looking at agency dictate, serious legitimacy issues were raised for the collaborative agreement process. All knew that the FWS must play a dual role as both partner and judge. Participants had to keep in mind that a given statement likely contained elements that were driven by each role. Confusion as to what they were looking at, and a FWS service reluctance to always make itself clear in the name of attempting to be inclusive,

non-autocratic, and yet a firm steward of the ESA had added to confusion and distrust.

Federal representatives, in the view of many in the states, would signal a willingness to arrive at a specific set of trade-offs in making an agreement as partner. Then, at later points, operating as a judge, the agency was seen to return to some other pre-compromise position. Negotiators working on behalf of water users found their paranoia fueled by FWS arbitrariness in bringing up new considerations after deals had been hammered out and written down. To them, it appeared that time after time, when the federal government would see an opening to gain more of something, they would keep "squeezing." "With them (federal authorities) a deal is not necessarily a deal."

Some of the most troublesome instances of this phenomenon were allegedly found in the matters of how far the FWS would go in considering options for addressing jeopardy to species. Such issues tended to center on the agency's defense of its July, 1997 biological opinion on the Environmental Account at Lake McConaughy and the Cooperative Agreement (Service 1997). To the FWS, the biological opinion must not be re-opened for serious re-negotiation or re-interpretation. Defense of the document thereby became a source of agency rigidity. In the view of at least some among state's representatives, deals made at the negotiating table were not accepted by FWS personnel in the Grand Island office during follow-up sessions. Grand Island personnel were viewed as taking stances in public meetings–highly defensive of the biological opinion--that were seen as distinctly uncooperative, rigid, and inconsistent with what water users believed to have been agreed to at more general policy levels. Over time, senior FWS authorities would modulate signals from Grand Island, but the negotiation process seemed to waver between mixed federal signals. States worried about what this all would mean for an on-going problem-solving partnership. In one instance, when water users approached Grand Island FWS personnel about what they considered to be serious flaws in the data and logic of the target flow calculations in the biological opinion, they were essentially told that nothing in the Biological Opinion was open for discussion and that "you play by the rules, or you don't play at all!" States asked: what kind of partnership is being hatched here? Can the states afford to sustain it?

Many state representatives could well understand the FWS's reluctance to re-negotiate the biological opinion upon which rationale for the basin wide habitat recovery program was based. But zealotry from some quarters of the FWS in defending a narrowly constructed biological analysis with all too little appreciation of optional implications of that biology, did undercut faith among the states in federal capacity for constructive discourse. A repeated FWS refusal to acknowledge any possibility of any flaw in the agency's biological opinion, and in the agency's judgments in applying the findings of that document, raised questions in the water users' view as to what kind of openness and collaboration they could expect in the future from the FWS. Were excessively rigid messages coming only from one local office? Would higher federal authority be willing to reach out and discuss issues in ways that were not purely peremptory? Did the messages reflect some shift of course from Denver or in Washington, D.C.? Their meaning shifted depending on the answer. Busy local people, often operating inadequate information about federal intent, constructed their own meanings that fitted their various and sometimes hostile pre-conceptions. The FWS became viewed by many as arbitrary, capricious, and undependable. For them federal partnership was deeply problematic.

While under attack from the states for being out of control, environmentalists have sometimes viewed DOI as too weak and altogether much too willing to compromise needs of the species. Some environmentalists walked away from the table for a brief period, in large part, because they saw the FWS as being too soft on issues such as target flows and land habitat acquisition goals for the first program increment. At least some in the environmental community have concluded that their best chance for effective action will come with threat of, or actual initiation of, court litigation.

Meanwhile, the FWS sat in the middle of the contending forces as its leadership attempted to steer a path that would serve the species and keep oppositions from getting out of hand–all this while not having sufficient personnel, time, or money. A United States Congress, divided over the wisdom of ESA as presently constructed, had not devised legislative solutions. Congress had clearly determined one thing however; it would hold the FWS on a short leash by seriously constraining its budgets. Whatever the FWS did by way of implementing the ESA via large scale basin-wide collaborative programs, it would do with seriously overworked staff and tight funds.

In the end, the issue of regulatory certainty for water users, the common need to avoid construction of individual water user reasonable and prudent alternatives , and the need for federal flexibility in confronting unknowns that accompany any ecological intervention, drove the whole negotiation process. The ESA has been a science driven law. Scientists are inherently conservative when making their best estimates because science is inherently imprecise. Scientific truth is always provisional. The best theories, models, hypotheses, and data sets today are open to improvement tomorrow. Scientists are, therefore, well advised to remain cautious in drawing conclusions about what will happen in a complex theory-defying and only partially comprehended world. There are generally large confidence intervals around all findings and projections. When left to themselves, scientists will require more water (or any other input) than necessary to secure habitat needs, because scientists really do not, and cannot, know exactly what is needed. Real birds and fish behave differently than best available models can predict, so the FWS must elect to err on the side of caution no matter what impacts such caution imposes upon water users. The ESA places the burdens of inevitable uncertainty on water users and the millions of people that they serve. That, of course, was from the very beginning exactly the intent of those who framed the ESA.

CHAPTER ELEVEN:
COLORADO'S NEGOTIATING INTERESTS–DEFENDING THE WATER TOWER

Living On the Gap

Citizens of this headwaters state have constructed a hydraulic society that lives off a fraction of snowpack run-off for a brief period each spring and a bit of warm season precipitation. They know that they must fulfill obligations to other states as required by compacts on virtually all of their drainages. The future for Colorado economy and society depends on keeping the widest gap possible between what mountain watersheds produce in a given year, and what is owed at the several state lines. The Colorado perspective is fundamentally driven by a need to defend as much flow as humanly possible while making maximum usage before letting it go to compact requirements and downstream uses across its borders.

The great nightmare of Colorado water policymakers–liberal or conservative, Republican or Democrat, west slope/east slope–is that Colorado will become a "pass though" water collector subservient to the demands of other states without sufficient capacity to use this resource within Colorado. No politician or water manager can make a career out of a vision of Colorado as a water tower that has lost too much control over its own spouts. Generations of water people have passed along a deep sense of paranoia as they view themselves continuously fighting rear guard actions on their drainages. To be "soft" on water on any one stream (e.g., the South Platte) has always risked setting precedent for every other river in the state. Downstream of the Colorado segments of the Rio Grande and Colorado rivers, especially, are high dollar entrepreneurs licking their chops as they contemplate the possibilities inherent in any change in Colorado's rules-of-the-game--for Santa Fe and Albuquerque, Las Vegas, Tucson, or Los Angeles. When any Colorado representative goes to any negotiation with an interstate re-allocation implication, it is done with extreme caution and absolute determination to preserve that precious gap between upstream water expected and downstream water owed at the state lines .

Most water that will flow though irrigation diversions and city treatment plants typically enters the cycle in the form of snowflakes that begin cascading from the skies in fall months and continue sporadically through spring. They lay down a narrow strip of snow–the pack is generally deepest between 8,000 and 11, 000 feet of elevation–along mountain slopes on both sides of the continental divide. About 80% of Colorado's surface water supply originates in snowmelt and rushes by in a three month period from April to June. As much as possible is trapped temporarily in a network of reservoirs laced to streams none of which are self-contained within state borders. About sixteen million acre feet, in average years, flows out of state and about one half of the total must be delivered to other states under terms of interstate compacts and two U.S. Supreme Court decrees. Geography alone insures that Colorado users will be defendants in virtually any western interstate water case involving its rivers flowing to any of the four corners of the compass. See Figure 8.

One twentieth of Colorado's agricultural land is irrigated, a proportion that exceeds that of any other state. The front range of the Rocky mountains from Fort Collins on the north to Pueblo on the south (Fort-Pueblo complex) is stage for the one of the nation's fastest growing urban strips. Mountain towns, pulling in all-important tourist dollars, seek to hold water high–at

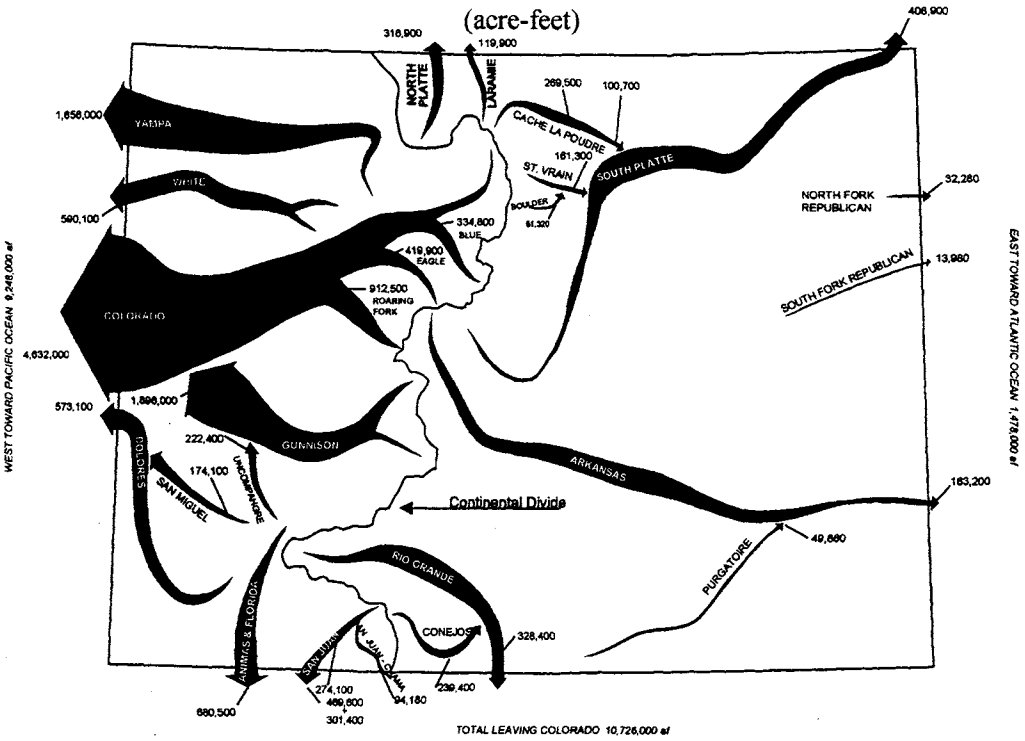

Figure 8 Colorado water outflows, major rivers

least for a first use–to sustain year around economies based upon winter sports, myriad forms of summer recreation, and traditional pursuits of ranching and mining.

In the context of the South Platte river, Colorado's negotiating position has been also been determined by its compacted relationship with Nebraska and several other related social, political, and legal considerations.

Colorado-Nebraska Compact

Interstate water compacts allocate rights to consumptive use (Dunbar 1983). They are treaties among states, ratified by the respective state legislatures, signed by governors, and adopted by the United States Congress. Colorado pioneered the use of compacts to resolve interstate disputes and its waters are the most compacted of any state. On the South Platte river, Colorado's water consumption is limited by an agreement with Nebraska that, if flows fail to equal or exceed 120 cubic feet per second of natural flow to Nebraska from April 1 to October 15 of each year, it is Colorado's obligation to curtail diversions of a specific set of Colorado users with priorities junior to June 14, 1897. This category of users subject to curtailment are those located downstream of the Washington County line where the South Platte flows through the

Balzac gauge and there is measured into what becomes the "lower river," about 100 miles in length as it winds its way northeast to the Julesburg gauge at the Colorado-Nebraska border (Figure 9)*. When flows exceed 120 cfs at the border, all Colorado diverters can be "in" the river subject to the constraints imposed on their priorities by Colorado's appropriation doctrine. When flows fall below that amount, Colorado users below the Balzac gauge with priorities junior to June 14, 1897 must stop their diversions. All this has been a bequest of that earlier generation of water negotiators who hammered out the compact in the years leading up to 1923 when it was signed in Lincoln, Nebraska on April 27.

The reason for the compact's division of the South Platte river at the Balzac gauge was that, above the gauge, the entire ordinary river flow was established long before commencement of canal construction on the lower South Platte river in Colorado or in Western Nebraska. Prior to

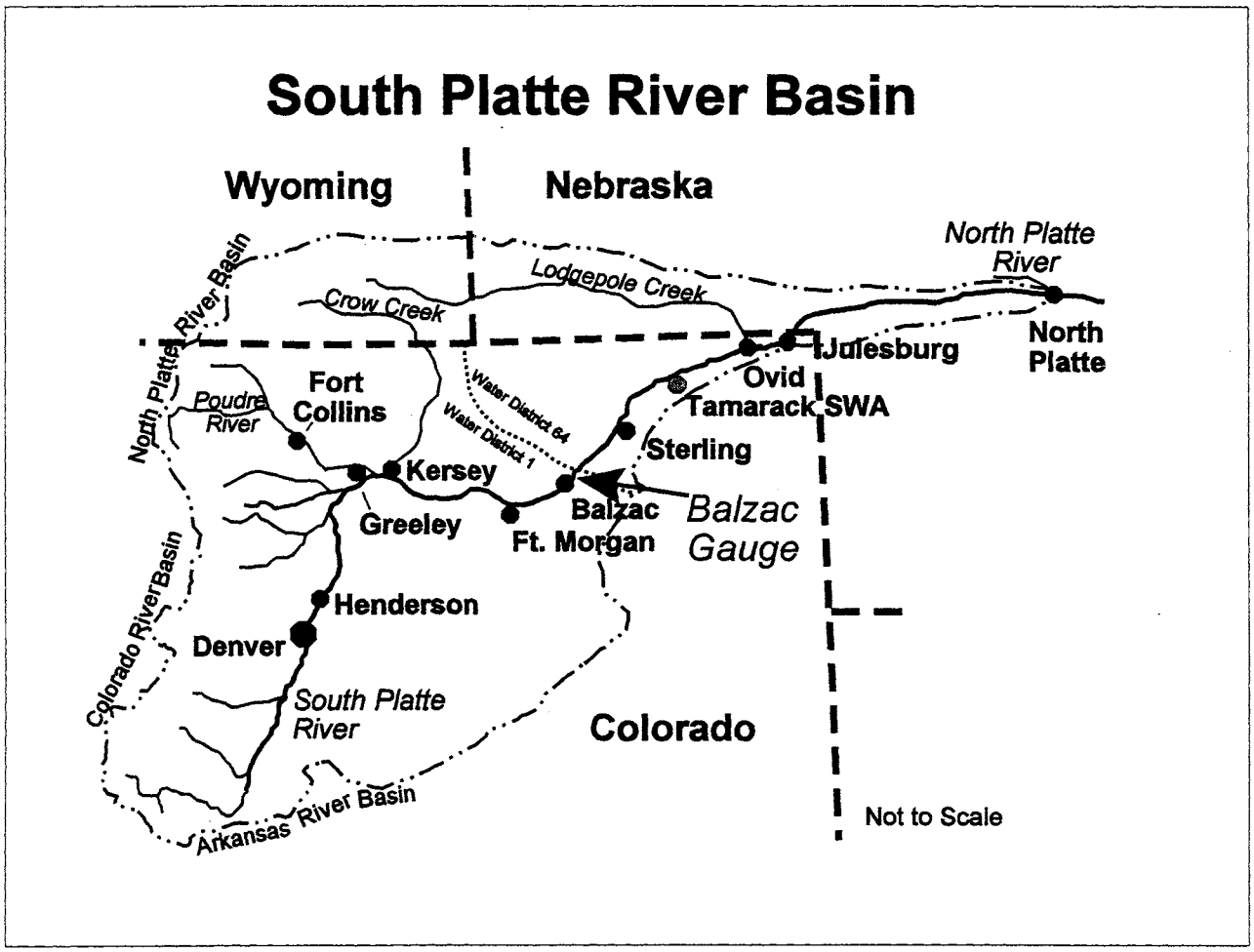

Figure 9 South Platte Basin, showing location of Balzac Gauge

* Note: The actual Balzac gauge was decommissioned in the early 1980's. Water is now measured about four miles upstream of the Balzac site at the Cooper gauge. Flows at the Washington County line are computed by subtracting several forms of flow loss that occur between Cooper and Balzac.

growth of irrigated agriculture along the upper reaches of tributaries, there was little–if any–surface flow at the Colorado-Nebraska state line after spring runoff subsided. Settlers had moved up past the Nebraska South Platte and what is now known as the lower river in Colorado for the simple fact that almost nothing flowed there during summer months. They sought the more bountiful supplies on the tributaries (e.g., Poudre, Big Thompson, St. Vrain, Boulder Creek) that also were easier to divert, not being a "mile wide and an inch deep" as was so much of the lower river. The lower river did grow in summer flow volume as European tributary settlement trapped spring flood flows in small reservoirs, as farmers diverted water onto their fields and let ample fractions escape back to the river bottoms during summer months. All this, combined with late 19th century and early 20th century transmountain diversions of Colorado and Laramie river water to Colorado's eastern streams meant increasing flows on the South Platte that would permit later construction of irrigation works on Colorado's lower river and along Nebraska's South Platte and the main stem. A study of diversion priorities on the South Platte clearly reveals the most senior priorities are concentrated in tributary headwaters with increasingly junior priorities following as one moves out onto the plains of the South Platte. These water return flow facts–and the slow but steady pattern of irrigation canal construction from the upper to lower river segments--justified the exclusion of the upper South Platte and its tributaries from the provisions of the Colorado-Nebraska compact.

On the whole, Colorado water users have viewed the Colorado-Nebraska compact as a "good deal" because it placed a firewall at the Washington County line (Balzac gauge) and Colorado diversion priorities junior to June, 1897 are vulnerable to shut down only below that point. Most Colorado consumptive use on the South Platte occurs above that gauge and Nebraska over the years has come to see the disadvantage of its position as it is compelled to focus only on juniors on the lower river when it has cause to look upstream into Colorado usage. For decades many in Colorado have held to the view that Nebraska has sought opportunity to re-negotiate matters. They fear the basin recovery program has presented just such a chance.

Colorado's interest is to insure that the compact is not re-negotiated in any meaningful manner, to preserve the firewall at the Balzac gauge, and do nothing that will allow Nebraska or federal agency agendas to penetrate upstream of that limit. A most practical implication, is that no Colorado water facility upstream of the firewall could serve the basin endangered species recovery program. Any Colorado water contribution would have to be in the lower river to preserve the firewall and it would be preferable to locate it as close to the border as possible to avoid having to work any program water through or past Colorado diverters. The key would be to find some method to get Colorado's water contribution into Nebraska without causing lawsuits by senior appropriators on the Colorado side and do so in a manner that would be recognized as real and legitimate by Nebraska and the Fish and Wildlife Service.

Colorado Side-Payment

Colorado users who needed federal permits to continue their operations were not located on the lower river. Rather, they were operating facilities much farther upstream in the Denver, Boulder, Loveland, and Fort Collins areas and in the mountain watersheds on both sides of the continental divide to the west. The problem became clear. Given compact and other considerations soon to be addressed, the Colorado contribution to the Platte River Recovery

Program would have to come from deep in the lower river segment. Yet, no water appropriators down river that far were troubled by considerations of a federal nexus. What could be done for them by users in the nexus that could make lower river users willing partners?

Most surface water canal diversions on the lower river in Colorado are senior to the Colorado-Nebraska compact date of mid-June, 1897. Most of those junior to that date have long since gone out of business. The real problem for irrigators in Colorado downstream of the Washington County line is the fact that virtually all groundwater wells are junior to the compact and are subject to being curtailed whenever flows drop below 120 cfs at the Julesburg gauge–i.e., the state line. It was long after 1897, and primarily after World War II, that high plains agriculture came to be served by the technologies of high capacity turbine pumps, rural electrification, and highly mobile drilling rigs that could quickly and cheaply punch deep holes into underground aquifers.

The typical Colorado irrigator in the area is both a surface water canal user who supplements ditch supplies that are likely to be senior to the compact date with well water that is certain to be junior. By definition when river flows drop below the compact requirement it is a sign that the countryside is dry. Dry times are exactly when farmers want to have their well pumps on to bring their crops though. But wells, being junior, are subject to shut down just when irrigators need them most.

Colorado and Nebraska negotiators of the compact in 1923 counted on a continuing increase of South Platte river flow during summer months given the re-scheduling of spring surges in the form of delayed return flows by cities, towns, and most of all by upstream irrigated agriculture. In April, 1923, their visions were of a continuously "growing regime of the river" less and less likely with the passage of time to fall below the 120 cfs compact requirement. This was a happy vision for everybody on both sides of the border.

However, by the 1950's and early 1960's, increased groundwater pumping along Colorado's South Platte caused problems, at first primarily for Colorado surface water canal appropriators. When a pump switch was flipped on and water gushed from a tributary aquifer beneath the ground, those molecules were simply emerging at an alternate point of diversion as compared to a surface flow though a canal headgate, and those molecules consumptively used were denied to a senior canal right somewhere on the river. That a junior well owner should divert water out of priority as compared to a senior surface water user threatened the most basic tenet of Colorado appropriation doctrine–i.e., first in time, first in right.

In Colorado's South Platte basin, virtually all irrigators have been both ground and surface water users. Undisciplined pumping of junior wells out of priority compromised flows available under senior canal rights. Junior well priorities were damaging senior canal rights and irrigators who were deeply vested in both were hurting themselves. By the 1960's, when senior priority ditches came to be "called out" of the river that had never before suffered that fate under similar conditions, farmer-members of the ditch organizations knew where the missing surface flows had gone–to junior priority wells. Such a situation was unacceptable for at least three reasons: 1) it violated state appropriation priority doctrine; 2) it allowed more junior investors to plunder the water owed to seniors; and 3) canal water flowing by gravity was generally cheaper than that

which had to be lifted by pumps.

Something had to be done and it was politically possible to do it because most irrigators were employing both water sources. One did not like being accused of depriving another irrigator of justly owed water and one especially did not like being so deprived by others. By the 1960's, Colorado irrigators were soon launched upon a voyage of discovery that would quickly lead to river augmentation. Owners of junior wells joined a variety of social organizations that collectively repaid the river in ways that protected senior canal priorities from the depredations of junior well pumping (MacDonnell 1988). There were a variety of river augmentation organizations by the mid-1970's and there are important differences among them. What they had in common was that junior priority well beneficiaries organized means by which to protect senior canal diverters from injury. One method was for junior well owners to organize to collectively purchase wells at or near the headgates of senior canals and pay the costs of insuring that each headgate would obtain its priority declared ration. Another method diverted water from the river at times of excess flows (fall, winter, and spring months), placed it into recharge pits calculated to produce return flow volumes at times and places necessary to prevent injury to senior right holders the following summer. All of this was made possible by the Colorado Water Right Determination and Administration Act of 1969 (MacDonnell 1988) and a set of technical practices (Warner, Altenhofen, and Odor 1994). By the early 1990's, Colorado water culture had produced one major headgate management organization (Groundwater Appropriators of the South Platte or GASP) that worked on behalf of well owners from the headwaters of the Platte all the way down to the lower river, and about 60 artificial recharge projects, most of them on the South Platte (Warner, Altenhofen, and Odor 1994).

Artificial recharge was sometimes an activity undertaken by individual well owners, small family groups, or entire ditch communities. Colorado had, thereby, created legally recognized technically feasible methods for protecting senior surface water rights from junior well pumping. This happened, not because of concerns with riparian habitat nor because most were concerned with Nebraska's compact requirements. Primarily, river augmentation via recharge came into widespread practice to protect Colorado senior users from juniors as mandated by the state appropriation doctrine.

However, a compact problem with Nebraska loomed. If one examined the overall annual flows of the South Platte across the state line, the happy vision of a continuously growing "regime of the river" came to pass for several decades. Economic growth in Colorado's Platte basin did exactly what the negotiators of 1923 expected it would–it made a bigger and bigger river. Although widespread pumping of the tributary aquifer was not foreseen in the 1920's, after groundwater technology diffused across the landscape in the 1940's, 1950's and early 1960's, expanded fields of summer corn demanded water and farmers turned on their pumps. River levels dropped on both sides of the border. The bigger river, as measured over a twelve month calendar, came as promised but the regime of flows was altered in a way that summer flows did not get that much bigger. On the one hand, Nebraska could not deny that the river was bigger in summer than traditionally was the case under pre-settlement conditions, but it was not the summer river that the Nebraska compact negotiators had hoped for. Colorado wells had intervened between Nebraska dreams and reality.

In summer irrigation season, when flows drop below the compact requirement, representatives from Nebraska visit Colorado sites to see that appropriators below the Balzac gauge with priorities junior to June 14, 1897 are properly curtailed. For farmers whose canal headgates are denied water, or for those whose canals cannot deliver sufficient volume to quench the thirst of crops burning up in the fields, the only option to prevent disaster is to pump wells, the first insurance for dry times. From roughly Greeley to the state line a huge aquifer of useable water is available but, from the Balzac gauge to Nebraska, the compact prevents wells from pumping when the stream drops below 120 cfs at Julesburg. The drought protection potential of the aquifer is denied just when irrigators most need it.

In average to wet years, the lower river has been fully augmented for many years, but western snowmelt rivers are notoriously variable from season to season. Even in a good year, during the month of August, South Platte flows leaving the state have averaged only 153 cfs (Ugland, Cochran, Hiner, and Steger 1993) and thereby exceed the compact standard by only 33 cfs–a narrow margin on which to hang the agricultural economy of the lower river. In 1999, the river at Julesburg gauge dropped below 120 cfs only two days. However, the following summer by mid-August, flows had failed to rise to that desired level for over 100 days! Two adjacent years; two extremes! Following a short drought period in 1976-77, the South Platte has enjoyed above average flows in all years to the summer of 2000 with the exception of six. In fact the period between 1977–2000 was the wettest in recorded South Platte history after the 25 year wet spell that occurred from 1905-29. This happy circumstance provided effective cover for Colorado appropriators to construct their augmentation projects and buy insurance against that inevitable summer season that would fall far enough below average to force that awful choice: curtail wells or mobilize Nebraskans into a lawsuit.

For decades Colorado water administrators were well aware of their vulnerability to compact imposed constraints in dry years on the lower river. They knew to fear the "drought gods" and the inevitable evil day that would require them to face down–even to shut down--angry struggling desperate farmers who had wet year resource assumptions capitalized by bankers into their farms. Well owners would curtail pumping or Colorado would face a Nebraska lawsuit. Two simple options; terrible choices.

There was a way out, a third path that became clear in the years leading up to the 1994 agreement to negotiate a solution for endangered species. By whatever means available, groundwater users must further augment their wells on the lower South Platte to such a level that even during drought scenarios equal to the biggest dry spells on record, the compact would be fulfilled (i.e., keep flows at or above 120 cfs) and the river would then be "bulletproofed" against Nebraska attack. Sufficient river augmentation would keep wells on, would keep the large tributary aquifer in play when needed for conjunctive use with surface water. This was an agenda that could earn the enthusiastic participation of lower river water users and it would have to be incorporated into any Colorado participation in the Platte river recovery program. Augmentation of lower river wells as part and parcel of the recovery program would win lower river allies for front range users in their quest for federal relief from jeopardy.

It would not be many years before the Colorado vision would be tested. Data show that the three years 2000–02 have been the driest since 1976-77. Colorado water administrators and

their staffs saw the portents during the years of negotiation (1994-02) and set about to put the fear of the drought gods in the heart of every lower river irrigator. Many irrigation farmers who had any meaningful level of well water dependency could easily see that their farms would not be worth much if they were to be required to curtail their well usage during the irrigation season. Without timely access to adequate supplementary groundwater, many of their enterprises would fail. Spurred by signs of drought in 2000, private entrepreneurs in a period of a few months that fall and early spring of '01 started up 21 augmentation projects on private lands. By the summer of 2002, private lands users had installed 20 additional river augmentation wells that re-regulated water from off-season surplus periods to high demand summer flows by employing recharge pits below the Harmony Ditch headgate to the Nebraska state line. The summer of 2002 also bore witness to a frenzy of river augmentation well and recharge pit installation above the Harmony ditch to insure that lower river well owners could continue to pump during the harshest drought year yet recorded. The push to produce augmentation water for marketable credit and protection of summer pumping has continued. As mother nature reduced mountain snowmelt that left reservoirs empty by fall, 2002, augmenters on both private and public lands were racing to re-time winter "excess" flows into summer surface water.

In this context, from the early 1990's onward, with the knowledge that they were living on borrowed time given by an inordinately wet period, front range water users requiring federal permits made an alliance with lower river users needing river augmentation to incorporate their mutual needs in a Colorado contribution to the three-state Platte River Recovery Program. A Colorado Tamarack Plan would emerge. It would center on public lands recharge for re-timing of flows from winter to summer and produce a burst of private land recharge projects for the same purposes. Lower river interests would advance toward their dream of a bulletproofed river vis a vis Nebraska and front range water users would get re-regulated water to save birds and obtain essential federal permits. The problem, of course, would be to sell all this to Nebraska and to the Fish and Wildlife Service.

Avoiding a Sacrifice Zone

One way to secure water for the collaborative Platte River Recovery program would be to dry up some fraction of lower South Platte Colorado agriculture and send the consumptive use fraction of that "saved" water across the border to serve program needs. There is more corn grown in any one of several Illinois counties than in the entire state of Colorado. The national economy would not miss Colorado lower South Platte production. In hard agricultural times, it would be easy for front range water users–e.g., Denver Water, Northern Colorado Water Conservancy District, etc.–simply to protect their permit needy projects with the Fish and Wildlife Service by putting lower river communities on the auction block. It would be uncomplicated for any such front range entity with sufficiently deep pockets to send out agents to quietly explore lower river markets, and cut mutually beneficial deals on a willing seller/buyer basis. The poor agricultural economy of the 1990's and early years of the new century simply set up many a farmer for a sell-out. The farm would return to dry land agriculture and the water would be put to use when needed for federal permitting purposes. It is a perfectly reasonable capitalist market based solution to the problem.

The social and economic forces at play have clearly placed lower South Platte

communities in a vise. One jaw is the Endangered Species Act and Colorado's response to re-regulate water at Tamarack for improved species habitat in central Nebraska. The other jaw is that front range cities–especially the Denver Water Board–have strong political constituencies that will not stand for any reduction in their water supplies. When push comes to shove as to whether water project "X" will be permitted, they can be expected to demand immediate solutions, and the cheapest quickest solution is to dry up economically hard pressed irrigators by giving them a "fair market" price, and commit the consumptive use portion of the water for permitting needs. That lower river ditch communities can be turned into sacrifice zones for the purposes of wealthier upscale front range cities is a given. The only real question is why front range organizations in need of permits have waited over the years while negotiations for a basin recovery program have dragged on. What is the source of their patience, at least so far?

There are non-trivial problems with a buy-up and dry-up scenario. Conscious and deliberate creation of a "sacrifice zone" would be divisive for Northern Colorado Water Conservancy District, sponsor of the USBR constructed Colorado Big Thomson Project. The district's boundaries include both upper river tributaries of the South Platte (e.g., Boulder Creek, St. Vrain, Big Thompson, Poudre) where the large urban-industrial-financial-educational cities

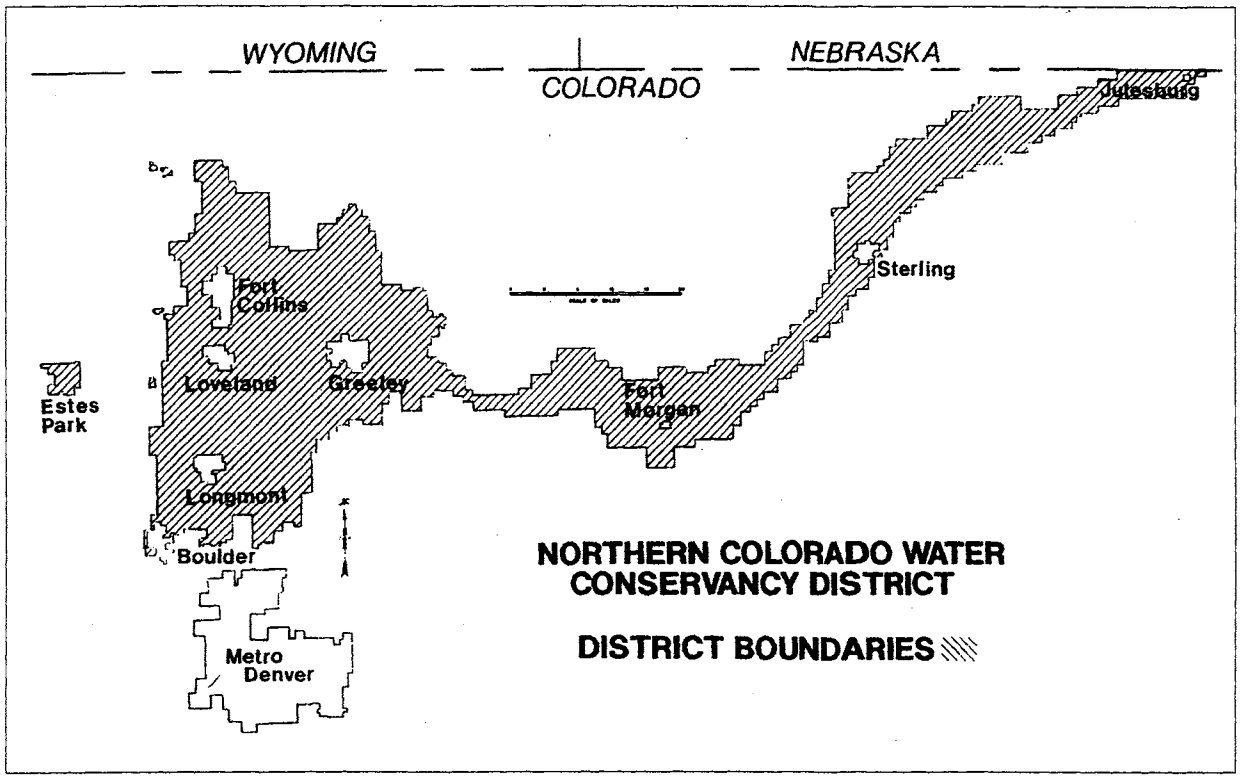

Figure 10 NCWCD Service Area and District Boundaries

are centered and the lower river small agricultural towns (See figure 10). The district's Board includes members from both upper and lower river segments. It is the fundamental mission of NCWCD to serve the people and communities of the lower river, not to sacrifice them. A willing seller of water, by definition, sees his/her interest well served by the sale. But others sharing the ditch system can be expected to suffer as they struggle to maintain their collectively owned and

managed canal property with fewer producers. Taking land out of irrigated production also reduces county tax base and the flow of dollars among agricultural product and service providers in the local community. Word that other water users needing permits upstream were attempting to fill the recovery program "bucket" by drying up lower river communities could be expected to create immediate opposition.

The balance of economic and political power within the district has shifted in favor of the upper system users who need permits, but any crude attempt to bail out their permit needs by the sacrifice of lower river communities would encounter feelings of betrayal, resistance by those left behind, and anger that could make life in the NCWCD boardroom a most unpleasant trial. If all options were exhausted it might be speculated that NCWCD could sacrifice the interests of the lower river in order to serve its larger more prosperous up-stream urban-industrial-research institution and high technology clients but it is not an option willingly contemplated. NCWCD would request Denver Water, and any other user in an Endangered Species Act Section 7 consultation, to support a collective effort on the lower river that could: a) deliver water to the recovery program; and b) avoid a rush to buy out and sacrifice lower river communities and economies which would be individually rational but lead to collective problems. For its part, Denver Water has preferred not to play the role of villain in the lower river communities.

A permit hungry water user rush to the lower river land and water market posed problems other than political ones. "Dry-up" of irrigated agriculture would create a supply of water for the recovery program, but that released supply must be somehow ushered down river past headgates that have every right, under Colorado appropriation doctrine, to take the newly added increments into their systems. Only a tiny fraction of the newly released flow would survive repeated diversions, deliveries, and field applications. Trying to run any such "bought out" water past headgates to the recovery program would create massive legal and technical problems. Legally, canal communities can take flows available according to their system of priorities. There is no provision for allowing a fraction destined for the recovery program to by-pass a headgate in priority. Also, how would it be technically possible to measure small volumes of water produced by scattered farm dry-ups, how would one get small flows past the diversions (most are temporary sand dams thrown up after the spring flood pulses), and how would one solve the problem of high shrinkage of small flows due to seepage in low flow river bottoms and to evaporation? Furthermore, "dry-up" that comes with willing buyers/sellers is difficult to organize in a concentrated viable pattern that would consolidate flows. There is little probability that water released from helter-skelter 'dry-up" initiatives of agents for different and competitive permit-needy buyers without any over-all plan in mind would lead to any coherent action plan. Finally, dry-up of irrigated farm fields that have been the source of run-off and return flows for a century or more can be disruptive of wetland wildlife habitat that has developed around concentrated leaky canals and reservoirs. There can be serious debate about how irrigation water has made possible species habitat, and the value of those species in the larger continental perspective. But, for example, how much neo-tropical songbird habitat might be destroyed by dry-up to put sufficient water into the summer river for the program? The welfare transfers among listed and non-listed species that accompany dry-up of irrigated agriculture are not easily analyzed and scored. All-in-all, there is every incentive to want to avoid confronting the legal, technical, administrative, and ecosystem welfare transfer problems associated with drying up irrigated agriculture in the Lower South Platte river.

Then there is a large inter-state policy concern with lower river "dry-up." The compact of 1923 with Nebraska gives Colorado citizens the right to consumptive use of South Platte water under stipulated conditions. As long as Colorado fulfills those conditions, why should Colorado as a matter of policy promote mechanisms whereby its own lower river communities are undermined in their consumptive uses so that Nebraska can be the beneficiary of an expanded consumptive use that rides with enhanced river flows? In the view of many in Colorado, the Nebraska camel has been trying to get its nose under the Colorado tent flap for a long time, and a Colorado policy of relying on "dry-up" would not only risk losing a tent peg, it would push at least some Colorado users and communities out of the shelter. Such action would throw out the bequest left to Colorado citizens by the compact negotiators. When that Colorado water–released at the expense of lower South Platte communities--is generated for the endangered species program, it will flow immediately and directly into Nebraska's Western Canal ditch, and the compact will have been effectively re-negotiated by front range permit hungry users seeking to advance their higher levels of production and consumption and will have done so at the expense of small agriculturally-based trade centers on the lower river. What is rational for an individual permit seeker in the hunt to find water may well not be rational for the larger community and Colorado policy.

Considerations of dry-up insure that Colorado water managers, contemplating their problem and options, would seek to avoid an easy reliance upon willy-nilly market-based dry-up of irrigated lands low on the Colorado South Platte. A better option had to be found.

Colorado Solution–Tamarack Recharge

Given the compact of 1923 and a desire not to re-negotiate it, given a river of increasing annual aggregate flow volume, given a need for front range water users with federal permit needs to develop an alliance with lower river users with dry year well augmentation needs, and given a need to forestall a free-for-all market solution that would sacrifice lower river irrigation communities and place water administrators in impossible legal and technical situations, local water managers in the upper and lower South Platte basin began searching for a viable option to serve the basin-wide recovery program.

To conduct the discourse that would be necessary to socially construct and organize a technical solution the South Platte water community created two organizations.

1. The Platte River Project (PRP)–a coalition of about 25 water users with a stake in the basin-wide endangered species program. Together they represented over two million people dependent upon the South Platte. Organized as a special quasi-autonomous unit within the Colorado Water Congress, this organization would: a) seek ways to support creation of a Platte basin endangered species recovery program; and b) collaborate with Colorado State authorities in putting together an option that would be consistent with Colorado law and the Colorado-Nebraska compact. The Project would secure contributions from each participant to cover costs (e.g., legal services), and create an executive committee to organize discussions, develop policy direction, and insure completion of business. Each contributing entity secured one vote. The Platte River Project has held meetings

regularly and has created the socio-political space within which the diverse interests of South Platte Water Users could be heard, considered, and incorporated into Colorado's lower river option.

2. The South Platte Lower River Group (SPLRG)–incorporated as a Colorado non-profit entity in the spring of 1996, SPLRG includes members in the lower river (below the Cooper-Balzac gauge) as well as some water user organizations that were also members of PRP. Members undertook technical analyses of possible options for generating Colorado water for the Platte basin recovery program; the focus was on hydrological analysis and database construction, project identification, and demonstration. When the Tamarack plan was created, and money would be required to build river recharge and augmentation works, SPLRG secured grants and/or in-kind services from several sources including the Colorado Water Conservation Board, Colorado Division of Wildlife, Ducks Unlimited, and proceeds from the Colorado State lottery. Officially, the articles of incorporation named four organizations as voting members:

   a. Lower South Platte Water Conservancy District (LSPWCD)–headquartered in Sterling, Colorado it was originally established to sponsor the ill-fated Narrows dam and reservoir project. More recently, it has shifted its mission to the construction and operation of well-augmentation projects on private lands surrounding the lower river.

   b. Groundwater Appropriators of the South Platte (GASP)–created in the wake of the 1969 Colorado Water Administration Act that required junior priority well owners to re-pay the river for water pumped from the tributary aquifer. By organizing collectively, well owners could find means to insure that senior surface priorities would not sustain injury from their pumping. The major strategy of GASP has been to pay the costs of installing wells at or near the headgates of senior priorities in a pattern that would prevent groundwater pumping injury to surface users, and to serve as a stable buyer of augmentation water credits produced by the many private owners of wells and sanctioned recharge pits. GASP is headquartered in Fort Morgan.

   c. Platte River Project–a coalition of about 25 water suppliers (urban and rural) municipalities, and businesses on the South Platte who organized to coordinate their participation in tracking, and supporting, the development of the central Platte habitat recovery program. It has been organized as a special project under the umbrella of the Colorado Water Congress. Leadership is provided by a management committee consisting of representatives of all members and contributors Members include Denver Water, Aurora, Boulder, Fort Collins, Fort Lupton, Greeley, Lakewood, Longmont, and Loveland, the Northern Colorado Water Conservancy District, and Central Colorado Water Conservancy District.

d. Northern Colorado Water Conservancy District (NCWCD)–established to sponsor the Colorado-Big Thomson transmountain diversion project that captures water on the west slope of the continental divide and delivers it though the 13-mile long Adams tunnel to users on the east in the South Platte basin.

The four voting member organizations have assessed themselves about $5,000/year to cover the costs of discussion, primarily costs of legal counsel, some equipment and demonstration project construction charges. SPLRG as an incorporated entity can receive and manage grants from interested public and private entities to advance the work of demonstrating water re-regulation for local, state, and national agendas. Its meetings have been valuable, not for bringing issues to a vote, but for providing a forum within which the South Platte basin players can meet, discuss, evaluate, modify, and come to a consensus about courses of collective action. On a given meeting day, the parking lot will have vehicles on display representing not only the four voting organizations but also pickups with shovels and canvas of ditch riders, local community leaders and town managers, area politicians, State of Colorado Department of Natural Resources, Colorado Water Conservation Board, Colorado Division of Wildlife, Ducks Unlimited, and local farmers and townspeople.

In the messy division of labor between the Platte River Project and the South Platte Lower River Group, SPLRG has arguably been a bit more essential to the creation of alliances between upper and lower basin water interests and the design of what would over the years emerge as the Tamarack Plan, while PRP has been more centered on keeping upper basin city and town managers informed of progress and in a state of mobilization to push the Tamarack Plan with state authorities. The fact that Denver Water, Northern Colorado Water Conservancy District, and Lower South Platte Conservancy District have been members of both groups keeps a rich set of cross-linkages active in the dissemination of information and perspectives in the two networks. Each organization has sustained a high quality of civic discourse about the challenge presented by the Endangered Species Act, options, and implementation of the proposed Colorado program–the Tamarack Plan.

Colorado's Tamarack Plan

Given that continued construction of water facilities has occurred on the Colorado front range–transmountain diversions, agricultural to urban transfers (it takes a bit less water to grow houses than corn), and non-tributary groundwater development in the Denver basin–the South Platte flows have been increasing over time and the trend is expected to continue (Hydrosphere Resource Consultants 1999). New flow creation is not necessary to serve the species recovery program, but change in the timing of flows is required. Analyses of the history of South Platte flows show that, in any given year, there are more months of flows in excess of target flows at the Grand Island gauge than there are months of deficit. Therefore, the trick is to re-regulate flows from times of excess to periods of shortage.

There are two possible methods for flow re-regulation:

1. use storage reservoirs on the lower river. There are at least two problems here.

First and foremost, there are no storage reservoirs on the lower South Platte that are in a federal nexus. None were built by federal dollars. They have been, like most irrigation facilities in Colorado, built and operated by mutual companies and irrigation districts using their own capital and these organizations have no intention of ever allowing themselves to be micro-managed by state or federal authorities. Second, construction of reservoirs is expensive, the better sites have already been taken, and in most cases construction would more than likely entail getting into a federal permitting embrace with appropriate agencies. The idea of constructing reservoirs for purposes of complying with the Endangered Species Act may be tantalizing in its irony, but was not generally endorsed as the wisest move.

2. use groundwater re-charge projects that will divert water in times of excess flows at the Grand Island gauge and then send return flows back to the river in periods of deficit–i.e., high demand months of June–September. Because the lower South Platte has never been re-constructed with big facilities that could deliver water long distances, and farmers have always lived off up-slope return flows, any re-charge project that could serve the endangered species river recovery program objectives would have to be located as close as possible to the Julesburg gauge at the Colorado-Nebraska border. This would have to be Colorado's option.

But where? It has to be a place with suitable soils and geologic features that permit the required fraction of water to return to the river channel in the intervals required–about 60–300 days. The USGS has constructed a logic of stream depletion factors–SDF's–that denotes the number days a given recharge site will require to return to the river 28% of a given quantity of water diverted (Warner, Altenhofen, and Odor 1994). Additionally, one cannot expect some small number of private landowners to be willing to sacrifice their operations to the needs of a South Platte agenda; therefore public lands were needed in addition to continued building of private river augmentation efforts necessary for purposes of protecting Colorado senior surface water priorities. There were several state wildlife areas on the lower river with good groundwater recharge potential and the SPLRG discussions would lead to the selection of Tamarack Ranch State Wildlife Area on the south side of the river near Crook, Colorado about 40 miles upstream of the Nebraska border. As the name implies, the site is owned and managed by the Colorado Division of Wildlife.

The Tamarack Plan (Boyle Engineering Corporation 2000), as it evolved in years of SPLRG discussion, would produce Colorado's re-timed water in two parts–1) a set of public facilities located on public lands such as Tamarack but not necessarily limited to that site; and 2) recharge pumps, pipelines, and pits installed on private properties with some form of as yet largely undefined state partnership.

At Tamarack State Wildlife area, water will be diverted in times of excess flows at Grand Island via canals or wells adjacent to the river. The diverted flows are to be conveyed to recharge sites at various distances from the river where it will be quickly absorbed by sandy soils into the underground aquifer and move with a given and known SDF factor back to the stream. Return flows accrue to the river for a period of time after entry into the recharge pit depending on known hydro-geologic conditions and distance to the river channel. Tamarack river augmentation is

planned to unfold in three phases:

Phase I. During the first recovery program increment specified in the agreement of June, 1997, Tamarack public lands recharge will produce no less than an average of 10,000 acre ft/year of augmentation water during times of shortage to target flows at the Grand Island gauge.

Phase II. Tamarack public land recharge also include facilities necessary to repay the river for "new depletions" placed on the river as Colorado economic growth projects upstream impose site specific diversions and associated consumptive uses on the stream. Careful analysis suggested that, based on historical experience in the basin, for every 100,000 additional people there would be a net depletive effect on the river of a bit less than 1800 acre feet/year. Tamarack II will consist of river augmentation facilities identical to those serving other phases, which will divert during times of excess at the Grand Island, Nebraska gauge, and repay the river for upstream depletions. Phase II facilities will be driven by the rate of population growth in the Colorado South Platte Basin. Environmentalists are generally pleased with this concept because groundwater recharge costs will send a price signal back to the water suppliers that reflects something of the cost of the depletions that they place on the river in their quest to serve economic growth. Tamarack, Phase II, represents the core of Colorado's future depletions plan.

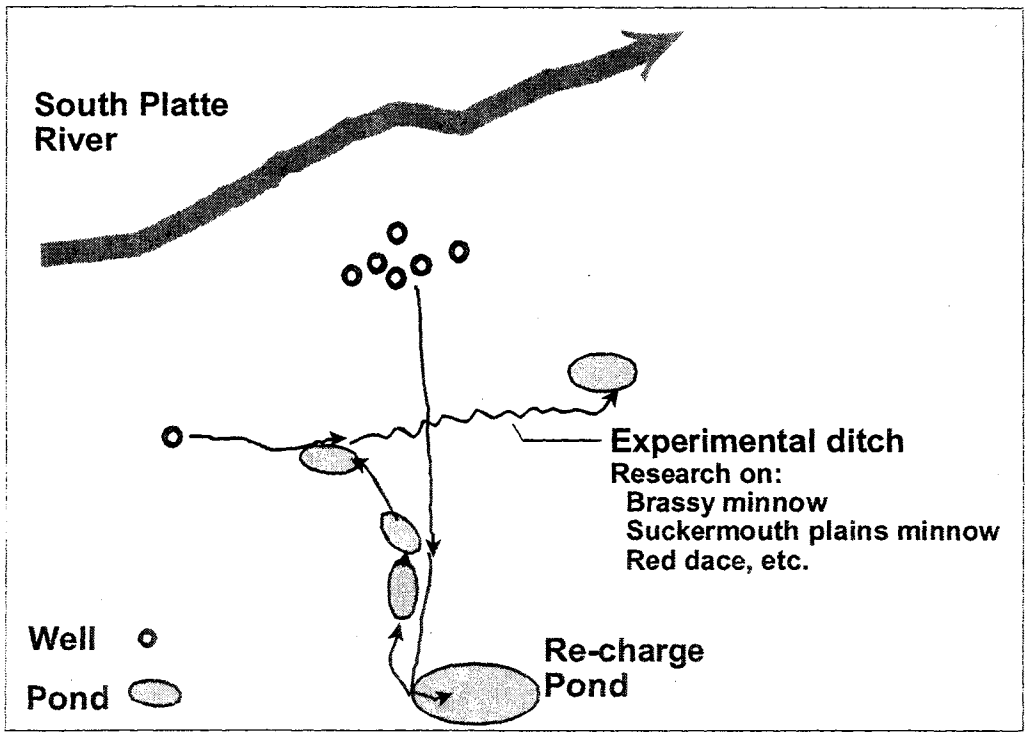

Figure 11 Tamarack Project Elements

Phase III. The 10,000 acre foot/year average for Phase I was agreed to as part of the negotiations that took place between 1994 and 1997 and that commitment was built into the 1997 Cooperative Agreement. But that agreement had only worked out means to produce a total of 80,000 acre feet/year and it had been agreed that something in the range of 130-150,000 acre feet would be required to build a reasonable and prudent alternative acceptable to the Fish and

Wildlife Service. Phase III of Tamarack has been conceived as the method to produce Colorado's proposed share of the 50-70,000 acre foot/year difference–i.e., a commitment to produce and average of 17,000 acre feet/year during the first 10-13 year life of the program. Phase III would consist of additional recharge at Tamarack, other public land sites (e.g., Pony Express) and other private land-state program partnerships. The plan calls for wells for recharge on public and private lands to be developed at a rate of about 10 wells per year; therefore, up to 50 wells are expected to be recharging for Phase III in about 5 years into the program. With each well pumping an average of 2,200 gallons/minute, the maximum monthly amount diverted from the river by these phase III wells will be approximately 14,500 acre ft. The average annual diversion from the South Platte River is expected to be about 56,000 acre feet.

The Tamarack plan fell under the auspices of NEPA because federal dollars have been used to partially fund state wildlife areas. To satisfy NEPA requirements, an Environmental Assessment (EA) was completed for Phase I of the Tamarack Plan. The EA was approved for a total diversion of about 30,000 acre-feet from the South Platte River, of which approximately 20,000 acre-feet could be pumped from wells and 10,000 acre-feet could be diverted into existing canals. For an enlarged Tamarack project the existing EA would need to be supplemented to provide for increased diversions from the South Platte River (Boyle Engineering Corporation 2000).

All this was about finding a path to a solution for the Colorado South Platte water user communities that would keep the compact intact, avoid dry-up of lower river agriculture, keep the effort close to the border so that the technical and legal problems of going upstream could be avoided and the river would get bigger during the critical summer months that lower river farmers would want to tap into the aquifer with their junior wells to supplement their canal deliveries. This was pieced together by local organizations on the river–not by Colorado State Government authorities. A community of water users emerged around the Tamarack solution at first with the endorsement of the Romer Administration but, in January, 1999, the Owens Administration would take office with a more skeptical view of what the locals had accomplished. Could the momentum established by local users carry the program through? The Colorado story would be one of local water managers devising a solution that fitted their circumstances and then trying to sell that solution to the state. Wyoming, and especially Nebraska, would have just the opposite problem. There, state agents would create solutions and be faced with attempting to secure the support of local water users.

CHAPTER TWELVE:
NEBRASKA'S NEGOTIATING INTERESTS–DIVISION IN THE BIG HOUSE

Nebraska is where the arid West begins. Two thirds of its length falls to the western side of the 98th meridian, that fixed marker of a variable point--shifting from wet to dry years--that defines precipitation of 20 inches a year or less. Nebraska farmers are world leaders in production of grain, and its economy is dominated by production agriculture and its support services. This is all made possible by extensive reliance on irrigation water, most of which is pumped to the surface by wells tapped into aquifers tributary to the Platte and to surface streams that, in turn, are tributaries of the Platte.

Given that the build up of return flows that sustained successively lower elevation irrigation canals on Colorado's South Platte and Wyoming's North Platte were longer in coming to Western Nebraska and were modest in quantity, many Nebraska farmers moved away from their dryland beginnings to irrigation by groundwater as soon as possible. Even with the largely positive impact on the summer river by Wyoming's North Platte and Kendrick storage projects, by mid-twentieth century there was far more Nebraska agricultural reliance on groundwater pumping than upon surface diversions of river flows into canals.

The big house of Nebraska irrigation would raise two offspring–a minority of canal water users and a large majority of well owners who have felt no responsibility for any impacts to surface water supplies. Surface water users with senior priorities have an inherent interest in the hydraulic connection between surface water availability and groundwater withdrawals that is not shared by well owners pumping ample aquifers beyond the grasp of their surface irrigating cousins. This difference in interest, and its implications for the proposed Platte basin endangered species recovery program, accounts for much of the Nebraska story.

The Big House Divided Against Itself

Nebraska is second only to California in area irrigated. The story of Nebraska irrigation has been well told by others (Dornbusch, Vining, and Kearney 1995; Dreeszen 1993; Opie 1993; Smith 1989) and no attempt will be made here to do it even cursory justice. As of 2000, there were over 110,000 registered groundwater wells in the state, the greatest concentration situated along the Platte in south central Nebraska. By 1990, over seven million acres were irrigated by wells as compared to about one million served by surface water canals (Dreeszen 1993). Irrigated agriculture accounts for about 94% of groundwater withdrawal with towns, cities, livestock watering, and industry accounting for the remainder. Eighty two percent of Nebraska's population has been estimated to be, in varying degrees, dependent upon wells.

The split between groundwater and surface water users has historically been so deep that it has been reflected in two distinctly different systems of water administration.

1. The State Department of Natural Resources, headquartered in Lincoln, administers all surface flows in accordance with Nebraska's doctrine of prior appropriation. Surface water exploitation, beginning in the 1860's, produced the doctrine of prior appropriation for Nebraska for the same reasons that it was adopted in other arid states of the West–i.e., those who had

already sacrificed much to divert water and build their communities did not want to be placed in jeopardy by the latecomer who would opportunistically take water upstream and thereby destroy the investment made by those first in time. For many decades of the late 19th and early 20th century, surface water users were the only significant players in Nebraska water.

2. With emergence of new groundwater technologies in the 1930's that diffused rapidly across the countryside after World War II, groundwater irrigation went through phenomenal growth that soon dwarfed the acreage served by surface methods. Well users were latecomers on the scene and, in any system of integrated priorities among the two sources of supply, well users would be clearly junior. In their view, it was critical that well owners succeed in operating independently of prior appropriation doctrine. Given the abundance of Nebraska groundwater, they have been able to do just that.

In 1969, the Nebraska Unicameral legislature passed a bill reorganizing 150 single-purpose water districts into 24 multi-purpose "Natural Resource Districts" (NRD's). NRD's were to address issues having to do with a wide range of issues–soil and water conservation, flood and erosion control, drainage, pollution control, wildlife habitat management, recreation, forest and range management, and water supply (Gaul 1993), (Longo and Miewald 1989; Stephenson 1994). NRD's are local units of government generally organized along river basin lines financed by district property taxes and governed by locally elected boards that employ a full time manager and staff to do the daily work. In 1975, the Groundwater Management Act authorized NRD's to form groundwater control areas. In 1982, NRD's received legislative sanction to do groundwater management plans if local interests were to see the need. By 1991, three groundwater control areas had been created in areas of declining water tables. The big problem in all this is that NRD's may have the potential to practice birth control over wells, but there has been no real enthusiasm most places to undertake such action. Additionally, NRD's operate independently of state appropriation doctrine and there is no linkage between ground and surface water administration. There has been no state imposed decision rule(s) that a NRD's must follow that would lead to an integration of ground and surface water management. In groundwater matters the state is largely confined to well registration and data collection.

Also, citizens residing within the districts are elected to board membership with no homogeneity of interest; one might be a banker, another a farmer with a well but no share in canal water, someone else may have surface water supply but no well, people might represent different groundwater situations–some with rising water tables and while others confront falling levels. Almost any conceivable proposition for action will be divisive unless much mutual "back-scratching and horse trading" can be brought to bear. Within this frame, the system of open access to groundwater creates multi-levels of insecurity. Each well owner is insecure vis a vis neighbors who, in exercising their right of capture, may damage the prior investment of others nearby. Then there is much insecurity regarding state policy intentions in the context of the federally induced Platte River Recovery Program and its unknown impacts. Much water discourse in the groundwater dominated areas of Nebraska is about how to defend the pursuit of individual rationality in well development in the context of: a) mutual interdependence where actions of one do affect others; but b) the multifaceted NRD organizational form makes it difficult to focus on the necessary agenda; and c) surface and groundwater users are separated by their distinctly different forms of organizational control.

Unlike many places in Texas, Oklahoma, and Kansas, Nebraska groundwater exploitation to date has not seriously dropped groundwater levels in most places with the exception of some areas such as are found north of the Platte, and around the Upper Republican river in the southwestern part of the state. However, any such generalization masks the critical variation which occurs in specific places that experience notable rises or declines in water tables. Nebraskans are fond of pointing out that it has been estimated that if all the groundwater were elevated to the surface, they would be swimming in roughly 33 feet of water from border to border. No state west of the Mississippi has as much. It is estimated that there are two billion acre feet of usable water stored in Nebraska's groundwater mounds that have built up by a combination of rainfall, river seepage, losses from leaky irrigation supply canals and reservoirs, and field runoff. This amounts to 700 times as much as is stored in all surface reservoirs in the state (Bleed 1993). As compared to other states in the arid west, Nebraska is truly the Saudi Arabia of groundwater.

This relative abundance lays at the root of a serious Nebraska problem. Most western states have developed a tradition of groundwater legislation and court rulings that provide a clear basis for dispute resolution among groundwater users and as between well users and surface stream appropriators. Given a history of easy and open access to the groundwater resource, Nebraska groundwater law has been notoriously underdeveloped because resource abundance postponed user conflicts that spur legislative and judicial action (Aiken 1980, p. 119).

In Colorado, to take a neighboring case, there were strong incentives among water users to integrate groundwater pumping into state appropriation doctrine because most well owners were also heavily dependent upon the performance of their canals. The pumping of wells, much junior in priority to senior headgates, threatened to undermine senior surface rights essential to canal flows. Therefore, beginning in the 1960's Colorado irrigators, launched a tradition whereby junior well operators organized to collectively pay the river back for well depletions to protect from injury to senior surface water priorities. However, no such tradition grew within the Nebraska framework. Nebraskan groundwater users--the big player in the Nebraska house of irrigation--with little to no part in ditch companies or surface irrigation districts, did not need to bear whatever burdens that groundwater exploitation might impose on the politically weaker occupant in the Nebraska house of water. If their well depletions hit the river and damaged a surface priority here or there, so much the worse for that surface right. Well owners in the water policy domain have held preponderant political power and used it energetically to insure that they would never be drawn into any apparatus of control such as they saw emerge upstream in Colorado after 1969.

The Groundwater Depletions Issue Gets Focus

Central Nebraska Public Power and Irrigation District (Central or CNPPID) owns and operates Kingsley Dam and Lake McConaughy and coordinates operations there with Nebraska Public Power District (NPPD), the sole purchaser of electric power produced by the Kingsley hydroelectric plant. Central serves about 1300 surface irrigation water accounts that, in turn, take their canal supplies for 112,000 acres of prime agricultural land.

Central was critical to getting discourse started in Nebraska about the connections between ground and surface water. It was in the federal nexus and needed FERC licenses. To this end,

Central could only satisfy FERC and the FWS by addressing the issue of groundwater depletions to Platte in-stream flows. It also was a major surface water supplier to agricultural users and needed to be concerned about depletions to those senior rights by junior wells. Central also had allies in the cities the water managers of which knew that they were dependent upon protecting appropriate levels in the groundwater mound and were generally in favor of well birth control in their areas.

Given the necessary conditions of atmosphere, soil, geology, and topography, earthen irrigation supply canals anywhere on planet earth will recharge aquifers usually with positive impact on well owners who obtain greater well yields and shorter less costly lifts. Generally, there will be a noticeable increase in small surface streams fed by the rising groundwater tables and often the growth of wetland habitat. One of the most striking examples of water-table rise associated with surface water projects is the large central Nebraska groundwater mound created largely by the combined operations of Central and NPPD (Bleed 1993, p. 61). There is a complex interaction between the surface flows of the Platte and its numerous groundwater mounds. On the one hand groundwater aquifers serving well owners have been amply recharged by depleting surface flows of the river at times when the water table drops below the river bed and flows move by gravity away from the river. Yet, on the other hand, there are substantial return flows from groundwater pumping to the main Platte channel.

What is clear to all observers is that the CNPPID surface delivery systems operate in a highly interdependent manner with groundwater. Surface water deliveries in many areas are supported by groundwater levels and well water use has worked to the advantage of surface users in at least some areas. The Central operations are testimony to Nebraskan's deep understanding of the interrelationship between surface and groundwater (Bleed 1993), (Diffendal 1993). Seepage from the reservoirs and canals of the Central supply system, and from on-farm water application, has resulted in water-level rises of more than 50 feet in some areas. Substantial rises in groundwater tables have occurred in a pattern south of the South Platte and Platte main stem for over 150 miles from Sutherland to Minden. The big water mound has created an unplanned surface-groundwater conjunctive use system that nobody foresaw when Central facilities were still on the drawing board. Here is a place in Nebraska where many water users employ both water sources, where surface water users have organizational control and want to insure that junior well pumping does not cause injury to senior surface rights. Here is a place that would support reform of Nebraska water law in a manner that would incorporate groundwater rights into the Nebraska's doctrine of prior appropriation. Here is support for carrying on that difficult discussion that the state has postponed–i.e., how to get groundwater integrated into the surface water agenda to protect senior surface rights.

It is a strategic goal of CNPPID to protect senior surface flows from the depredations of what should be junior well owners. Few yet have placed a call on the river, found it not sufficiently served, and been willing to try to call out the pumps. But, there are considerable numbers of farmers who systematically cannot get full service from their canals due to groundwater pumping. Given the social forces at play, most have so far chosen to defer the looming fight. Well users do threaten surface supplies, not only in Central's command area, but also in many other specific places around the state. The fight is brewing. One knowledgeable informant who has viewed the situation statewide for many years noted: "Many people in

Nebraska don't realize that we would have a big problem even if the Feds and the ESA went away."

Enter Federal Agendas

Central and NPPD spent over $30 million between 1984 and 1998 dealing with FERC re-licensing issues under the Endangered Species Act. By 1994, after the governors of the three basin states signed the agreement to work with the Department of Interior, the FERC discussions at Kingsley Dam and Lake McConaughy were tied to the Platte River Basin Recovery Program. If negotiations for a basin-wide solution were to fail, the two districts were put on notice that they would have to return to individual consultations under Section 7 of the ESA and re-initiate the re-licensing process. This constituted powerful incentive to make the recovery program negotiations succeed.

The 1994 Memorandum of Agreement, that cast a vision of the new world to be negotiated by 1997 and the years beyond, had two appealing features. First, the concept of "adaptive management" promised a partnership arrangement among local users, state authorities, and federal agencies within which new information and options could be incorporated in ways that could reward local knowledge, initiative, and creativity. Second, the agreement made it clear that there would be allowance for future growth in water use as long as any new depletions to flows protected by the program would be offset. This is exactly what Central and other surface users had been angling for over the years. No local water leader wants to be caught saying things too nice about federal environmental agendas, but here was a requirement of an environmental agenda that suited Central. Working out ways and means to protect in-stream flows would establish principles that could apply to the management and offsetting of groundwater depletions. Surface users were gaining some leverage if only it could be constructively applied.

A Central annual report (CNPPID 1999, p. 5) noted that, under pressure from the ESA, Nebraska was moving toward some form of integrated management of surface and groundwater, at least in terms of general policy. ESA considerations were driving Nebraska to undertake extensive groundwater investigations and modeling activities (Cooperative Hydrological Study or COHYST). Municipalities with multi-million dollar investments are heavily dependent for their supplies upon re-charge from surface water which they fear will be intercepted by new well installations and increased pumping, and the issue of groundwater-surface water had emerged in then two on-going lawsuits (Nebraska v Wyoming on the North Platte and Nebraska v. Kansas on the Republican river). Central was a major player on the Nebraska stage and it wanted federal permits. Furthermore it was a major contributor to the central Nebraska water mound and it wanted to protect surface rights of its users from the depredations of well owners.

The convergence of Central's long-standing concern with getting well owners to offset their depletions with the federal need to address the same issue insured that there would be two difficult discussions simultaneously:

1. in a state with two separate water administrations, how could groundwater administration be integrated into the surface water agenda to protect surface senior rights?;
2. how can the state of Nebraska confront the federal ESA agenda?

Discussion of each question has antagonized those heretofore autonomous well users.

The Looming Decision

It is clear that surface and groundwater interests are unreconciled and will largely remain so well after that moment in late 2004 when it comes time for the Governors of three states and the Secretary of Interior to sign a completed agreement for a basin-wide habitat recovery program. The great majority of well owners do not appreciate falling into the embrace of any discussion that is going to "pick their pockets" so that two districts–CNPPID/NPPD--can secure permits. In their view, the districts do little for them (ignoring the build up of the central Nebraska groundwater mound), and they resent the fact that the districts are prepared to settle the issue "on the backs" of well users.

Nebraska Governor Mike Johanns has seen the problem. To gird himself, he has appointed a 23 member Citizen Advisory Committee representing a variety of interests. They include representatives of irrigation districts, NRD's, center pivot sprinkler irrigation equipment manufacturers, agricultural business people, groundwater users and surface right appropriators. One thing they all have in common is that none have had any involvement whatsoever in the basin negotiations nor have any had anything to do with putting together Nebraska's water action plan. Generally meeting about every other month to review the negotiation effort, they are charged with making a recommendation to the Governor in a "yes/no" format as to whether or not the Governor should endorse the Platte River Basin Habitat Recovery Program Agreement. No one can predict, at this writing, what the Council's recommendation will be or what the Governor will do with it. It is safe to say, however, that Nebraska negotiators keep well in mind the Advisory Council, the constituencies represented there, and the Governor's political problem as he faces a deeply divided Nebraska house of water.

Negotiating Themes–Challenge Colorado on the South Platte

In each of the three states, the problems of re-regulating water for the endangered species recovery program were much more political than technical. Water could be re-regulated by various means; the greater problem was how to formulate a negotiating strategy that could build a coalition of support and neutralize or minimize opposition. In Colorado local users in putting together the Tamarack Plan had to weave together upper and lower South Platte interests, in Wyoming state authorities built a coalition around Pathfinder, dam safety, and addressing selenium on the Kendrick project. In Nebraska, given the divided house of irrigation, what could be done that could win support across the countryside, the state unicameral legislative assembly, and among the Governor's advisory committee?

This question was being addressed in the mid-1990's to just after the turn of the new century, years when American agriculture in general, and in the three states of the Platte basin, was suffering some of the worst economic times since the 1930's. Farmers were hurt by jumping energy prices for their fuel intensive enterprises, severe drought beginning in 1999 and staying on, and--worst of all--commodity prices at the farm gate collapsed. Farmers everywhere were in trouble and nowhere more so than in Nebraska. Such pressing times would mean little patience for talk about changing water rules just when below average rainfall and low sub-soil moisture

was increasing irrigation demand. Hard pressed irrigators did not make for kindly audiences. Negotiators wished for better times to be addressing how production agriculture might have to adjust in order to create improved habitat for three birds and one fish.

As a downstream state, Nebraskans have always looked up river with anxiety about future flows. Nebraska interests had vigorously opposed Grayrocks and Deer Creek projects in Wyoming. Its lawsuit filed against Wyoming in 1986 attacking expanded use of North Platte waters had–in the settlement of 2001--turned out about as well as it could have been hoped by effectively preventing any future net increases in Wyoming consumptive uses. Although Nebraska negotiators could not then foresee how Nebraska v. Wyoming would be resolved, they knew they were making an all out effort against Wyoming on the North Platte and that they would have to go after Colorado on the South Platte where, over the years, Nebraska had expressed clear opposition to Colorado's Narrows and Two-Forks proposals.

From April 1 to October 15, the South Platte Compact stipulates that the flow at the interstate line must not be diminished below 120 cfs by Colorado users downstream of the Balzac gauge with priorities junior to June 14, 1897. But water in excess of compact minimums was always welcome and it had been expected given a historically "gaining" river. Neither Nebraskan nor Colorado framers of the 1923 Compact could foresee the coming of extensive well depletions that would send summer flows at the Julesburg gauge all too close to–and even at times below--the 120 cfs minimum. Nor did their crystal balls permit them to foresee an incredible growth of Colorado front range cities that would threaten to always suck up a major portion of the gain in summer flows. Nor did they then anticipate urban water suppliers–especially Denver Water in the wake of Two Forks debacle–launch plans for water re-use projects that would re-cycle effluent back into the cities and thereby add another consumptive use further diminishing return flows. As the years passed after the Compact signing, Nebraska began to see the disadvantages of its position and would seek ways to re-negotiate arrangements on the river without ever explicitly bringing up compact matters.

Two languages would emerge in negotiations pre- and post-1997. Colorado would use a language of fulfilling compact obligations, and thereby remind all that it could consumptively use all waters on its side of the border as long as compact conditions were fulfilled. Nebraska, on the other hand, would adopt a language of "regime of the river," and thereby advance the view that waters traditionally available in "excess" of compact minimums were open to discussion and could be divided up in the context of recovery program needs. If Colorado could be expected to resist such "regime of the river" considerations, Colorado would simply have to contemplate that they were essential to any Nebraska participation in a recovery program. Discussions would center on the sword thrust of Nebraska's insistence that the South Platte "regime of the river" be preserved and enhanced. Colorado would parry with its compact shield.

It was the essence of Nebraska's negotiating effort to get Colorado in an embrace and then push discussion about "regime of the river." It would be Colorado's determination to back away and keep safe distance. Nebraska gambits to preserve and enhance the "regime of the river" presumably played well back home, but a mostly silent Colorado water priesthood would only utter its incantation–compact, compact, compact! Tamarack, Tamarack, Tamarack!

Nebraska sword thrust: Tamarack is not "new" water, it is simply what Nebraska is going to receive anyway from Colorado, and is just re-regulated from fall and winter to spring and summer! Colorado should "dry up" some existing consumptive uses–e.g., irrigated agriculture–and send that quantity across the border. That would establish that Colorado was serious about the proposed recovery program, that Colorado users were prepared to make sacrifices like Nebraska's citizens were being asked to do, and it would preserve the "regime of the river" (i.e., sustain or increase the level of excess to the compact) to serve the habitat recovery program.

Colorado parry: the compact preserved Colorado's right to have its consumptive use and there was no need to "dry up" anything. Forced "dry-up" on behalf of the recovery program would amount to nothing less than a betrayal of the compact. The South Platte is a gaining stream and Tamarack re-regulation simply re-times a small fraction of that historic gain so that it reappears at the right time during spring and summer months for recovery of the critical habitat. All water is "old" water in the sense that it has been used and re-used several times before it hits the border, but Tamarack water is "new" in a fully meaningful sense that it appears as added flow when needed.

Nebraska sword thrust! Let us see some real diversity of Colorado project options. Let there be a systematic comparative analysis of several possibilities for producing program water. Let us show Nebraskans who are asked to endure pain for the recovery program that Colorado users are also at least willing to consider making a real sacrifice by taking a wide scan of water options. If it turns out that careful analysis of all other options establishes them as inferior to Tamarack, and if Nebraska can be party to evaluating those options, then Nebraska will feel comfortable explaining that fact to Nebraska water constituencies, most especially the Governor's Advisory Committee. For example, Colorado has an opportunity to produce significant water at Beebe Draw, an alluvial aquifer located between Barr Lake and Milton Reservoir east of Fort Lupton and Brighton. It would be a groundwater re-charge project similar in principle to that at Tamarack with high capacity wells being pumped to deliver water back to the South Platte when shortages at target flows exist at Grand Island. Beebe Draw is a possibility that should be subject of inspection and in-depth analysis.

Colorado parry! To put Beebe Draw on the negotiating table is to flirt with the possibility that Nebraska (and Federal agencies) would have an interest in a recovery program project activity upstream of the compacted firewall at the Balzac gauge. Colorado will not engage in a serious discussion of Beebe Draw (sub-text: or any other option upstream of the compact firewall). Colorado simply will do nothing that will permit Nebraska trespass beyond that line, mutually agreed to in 1923.

Nebraska sword thrust! If Colorado really wants a partnership with Nebraska to make a basin-wide recovery program successful, Colorado must be responsive to Nebraska's need for preserving the historic regime of the river. The compact was not written to address ESA recovery program issues that are entirely independent of the compact. The price of Nebraska participation in a collaborative recovery program is protecting the regime of the river. Colorado should not stand rigidly and mutely behind the compact but reach out and work creatively and collaboratively with Nebraska.

Colorado parry: While Colorado agriculture is declining along the South Platte due to rapid industrialization and urbanization along the front range, a groundwater-fed irrigated agriculture continues to expand in Nebraska. Nebraska is less concerned with recovery of species habitat and more intent upon enlarging flows of South Platte water so that Nebraska can continue its history of not replacing its well depletions. Colorado will not re-negotiate the compact as a price of having a habitat recovery program, and it is not interested in bailing out Nebraska well-owners who must confront the costs that they have imposed on each other, surface users, and the river.

Nebraska sword thrust! Colorado should apply for a Nebraska water right to convey Tamarack water downstream to critical habitat. Colorado's Tamarack contribution cannot flow "unprotected" and must be registered by the proper authorities in the Nebraska Department of Natural Resources. Technically, Nebraska could assign that right to the United States' Department of Interior (USFWS) if the federal agency would apply. However, such a move would be a public relations nightmare as Nebraskans of all stripes would protest vehemently any water right falling into the hands of a federal agency. One of the two districts (CNPPID/NPPD) could hold the right to Tamarack flows, but from a Nebraska perspective it would be much cleaner if Colorado would hold a Nebraska right to conduct its contribution to the program.

Colorado parry: Colorado will not apply for any water right in Nebraska. It is Nebraska's responsibility, by whatever means, to usher Tamarack flows to critical habitat. Nebraska's invitation to Colorado is little more than a thinly disguised subterfuge to get Colorado in its grasp on Nebraska turf and force a review of virtually any aspect of Colorado's water contribution it wishes. Colorado has nothing to gain from mounting a defense of its water contribution in unfriendly territory.

Nebraska sword thrust: there needs to be a "fair share" solution that reflects, at least roughly state user depletions in the basin. In the domain of money and water contributions for the first phase of projects (producing and annual average of 80,000 acre feet) agreed to a McConaughy, Pathfinder and Tamarack in 1997, it was stipulated that the states' share of cost should be divided on a 40/40/20 basis with Nebraska and Colorado paying 40% each and Wyoming contributing 20%. Now that we are discussing how to get the balance of required water to achieve the full 130-150,000 acre foot annual average reduction to target flows, something approximating this same split should be employed. Colorado, to get up to a 40% contribution must produce much more water than what has been offered by Colorado at Tamarack, making it possible for Nebraska to deliver less to the recovery program. Nebraska understands that, the closer the water source is to the critical habitat, the easier it is to arrange to deliver program water. There will be less conveyance loss, fewer negative third party impacts, easier measurement of flows and smoother administration of water rights. Even though all of this holds true, Nebraska citizens will not allow Nebraska to give away their consumptive use rights too disproportionately. Wyoming's efforts are much more proportionate to the whole of the program than is Colorado. Colorado must do more.

Colorado parry: Colorado users will divert from the South Platte according to their appropriation doctrine and compact entitlement. Tamarack water that is "new" will be available at the border, Nebraska can deal with it on its way to the critical habitat. Nebraska's call for a 40%

water share from Colorado is nothing less than a call for a major re-negotiation of the 1923 compact–a division of the waters accepted by both state legislatures, signed by the respective state governors, and endorsed by the United States' Congress. Nebraska treads on dangerous territory if it continues to insist the Colorado abandon that agreement and revise its obligation upward. Furthermore, compact issues aside, Colorado has not done the damage to basin flows–especially to pulse flows and sediment movement–that the dams and diversions of Wyoming's and Nebraska's North Platte have imposed. The South Platte is a gaining river that produces greater supplies than historically were available (Nebraska seriously questions this assertion!) and, most of all, the absence of on-stream storage below Denver has meant that the South Platte contributes virtually all natural flood pulses and sediment for sandbar building. Any fair share calculations in terms of costs imposed on critical habitat must reflect that Colorado's damages are far less than those of the other two states which together "broke their river." Colorado did not "break" its river.

Nebraska sword thrust! Federal regulators, in negotiating the conditions of FERC re-licensing of the Kingsley Dam and associated facilities, developed an analysis of how the environmental account at Lake McConaughy would work. As they did so, federal analysts did not take into account Nebraska-Colorado compact considerations or constraints, nor did they incorporate the Supreme Court endorsed settlement with Wyoming, something that became final after the Kingsley Dam re-licensing. They simply built the historical flow regimes on the South and North Platte into their calculations and employed their estimates of flow volumes in specifying CNPPID/NPPD re-operation obligations. Nebraska had little choice but to accept these FWS/FERC imposed conditions as a condition of re-licensing. Therefore, Nebraska has little choice but to release flows downstream on a regime mandated by FWS/FERC, but it must do so without full control of what is happening upstream on either the North or South Platte. About eighty percent of flows into Lake McConaughy have been return flows. The recent Nebraska-Wyoming Supreme Court settlement did not address the issue as to whether Wyoming could add winter season consumptive uses below Guernsey reservoir. Insofar as Wyoming places new consumptive uses on the North Platte, there will be less return to Nebraska. New consumptive uses in Colorado will also impose costs on Nebraska that must be made up by North Platte waters. Management of the North and South Platte are highly interdependent and Nebraska is placed at risk due to factors under control of Wyoming and Colorado. Loss of water on either the North or South Platte will place pressure on the other to produce compensating flows for the critical habitat or Nebraska will have to unfairly "eat" the loss. Colorado and Wyoming must accept their share of burden imposed by the program by not eroding the historic regime of the river with new consumptive uses.

Colorado and Wyoming parry: There is little real problem to be solved. The FWS, in insuring that the mandated program flow volumes get to critical habitat, and in exercising its powers of review, will protect Nebraska interests. If a water user should apply for a permit to place a new consumptive use in either Wyoming or Colorado, it will either be in a federal nexus or it will not. If it is in a federal relationship, it will have to seek approval for its enterprise in an ESA Section 7 consultation process. The FWS can be expected to deny any new water use that would place critical habitat in jeopardy and that would mean protecting inflows to Lake McConaughy and outflows from Colorado's South Platte. If the new user is not in a federal nexus, that user must still acquire state approval for the use under that state's future depletions

plan. Such plans, one way or another, will provide compensating water. Such offsetting supplies will protect Nebraska. If the new consumptive use is not acceptable within the framework of that state's depletion plan, the new user will have to surmount a series of tests: 1) it would have to establish that it was not in any federal nexus and in no way compromise flows into any of the big three recovery program re-regulation projects–i.e., the environmental accounts at Pathfinder and McConaughy, and Colorado's Tamarack plan; 2) it would have to establish that it would not injure any existing priority under state appropriation's doctrine; and 3) and it would have to establish that it would not damage any state's new depletions plan. In order to get by any or all tests, in all likelihood the promoter of any such new consumptive use will have to provide offsetting water. Nebraska is in little danger of any non-trivial loss. Any minor losses will pale in comparison to what undisciplined Nebraska groundwater use imposes on the river.

Nebraska's Water Action Plan–Protecting the Central Water Mound

Nebraska's plan for contributing program water is centered on protecting the central Nebraska groundwater mound that has been largely built up over the course of the last 60+ years by return flows from CNPPID canals, reservoirs, and cropped fields served. Nebraska has always feared losing benefits of the water mound to outsiders. Over the years there has been speculative talk about large scale water transfer schemes–e.g., to metropolitan Denver–that in all probability are not even close to being economically viable (Gaul 1993 227). However, poor returns have not stopped many other projects around the country, and Nebraskans see preservation of the mound as essential to their future. This is not a state that will likely be a major tourist destination such as Wyoming or Colorado, nor do they see themselves as likely to host major high technology or large industrial centers. Nebraska's future is heavily dependent upon sustaining a viable agriculture supported by the essential services and smaller scale industries. All this will require preserving and enhancing the great central groundwater mound.

Nebraska authorities are determined not to permit "mining" of its groundwater–especially for federal program purposes–because that water is essential to long term economic and ecological sustainability and for the absolute necessity of protecting senior water user rights. Data are not yet available which clearly establish the extent to which Nebraska well pumping is depleting the mound. It is clear that, if Nebraska is to join the cooperative basin recovery program, it will have to engage in well birth control and, even more importantly, organize means by which some well owners at least (see depletions plan below) can pay back–with or without assistance from the state–depletion debts to the river. Finding supplies of water to offset historic well depletions will take an as yet unknown fraction from the water mound. There are two beneficiaries to protect: a) Nebraska surface irrigators who have had their canal service undercut by undisciplined well depletions; and b) the federally mandated endangered species habitat recovery program. Nebraska is willing to employ water from the mound to protect the first–Nebraskans who have every right to expect redress under state appropriation doctrine, but state authorities were not prepared to place any meaningful fraction of the water mound on the negotiating table for the federal endangered species agenda. But how much water will be required to offset Nebraska well depletions? Where should it be extracted? No one knew. In a highly uncertain world, it was Nebraska's interest to keep the mound off the table.

Early on, Colorado and Wyoming did what they could to get water from the mound on the

table. They argued for a "least cost" approach to finding program water. Let program participants go out and find the most inexpensive supply (i.e., Nebraska supplies available in the central mound closest to critical habitat) and then other partners could simply contribute two thirds of the necessary cash to pay costs of getting that "least cost" water to the critical habitat. The logic was simple and compelling to anyone who thought least-cost economics should rule the world. Furthermore, there were central Nebraska allies who would see the Wyoming and Colorado suggestions as welcome. These were central Nebraska residents–urban and rural--suffering from high water tables at specific locations along the mound or in areas with high water tables beyond the central water mound. For example, the city of Grand Island (not on the central mound) was located on a former wetland and in places its land surface ranges up to several feet below the bottom of Platte river channel. Dropping the water table a bit would represent welcome relief. Nearby, farmers battled high water tables and would benefit from schemes to drain more water back to the main channel where it could serve critical habitat. Colorado and Wyoming had every interest in highlighting such possibilities. Could not water be pumped or drained from high water tables to restore river flow and wetlands?

Negotiators in Lincoln, not about to allow federal agencies to get their hands on the mound, were in no mood to countenance such talk. They wanted no significant fraction of the big central groundwater mound to be tapped for the recovery program. Furthermore, money from Wyoming and Colorado could never be equivalent to retaining full control of the mound. It would be politically disastrous for Nebraska to take such a disproportionate share of the water burden while being bought off by Colorado and Wyoming money. Citizens representing many interests would be infuriated. The powers-that-be in Lincoln and Omaha would shift attention away from the high water table problems around Grand Island–and elsewhere along the central water mound--and insist that discussions focus on issues of "fair share" and "regime of the river" at the borders. State authorities may have to address issues of high water tables in central Nebraska with local interests there, but they are determined that such discussions will be entirely separate from those about Platte River Basin endangered species habitat recovery.

Nebraska Future Depletions Plan

Nebraska well users have continued their investment in new groundwater extraction. There have been 4,407 wells constructed and registered on lands within the cooperative agreement areas between 1997 and 2002 Nebraska, 2003 #442]. State negotiators, however, had to agree in the negotiations leading up to the 1997 Cooperative Agreement that depletions from all wells installed on or after July 1, 1997 will be offset. Well owners, and surface water users, with permits and priorities prior to that date would have their depletions covered by a successful basin recovery program. This obviously should take away much sting for the vast majority of well owners who had sufficient wells installed before mid-1997, and did not seek expansion. But, what about groundwater users who got new wells and maybe wanted even more?

It was one thing to agree in principle to making post-1997 well installations and new surface water projects accountable to the river for their depletions, but it was quite another thing to implement it in the context of Nebraska water politics and do so in a manner that would cause minimum duress for Governor Johanns. Nebraska needed time to think, to plan, to build a coalition of support for a changed water regime. Authorities pursued a two-pronged approach:

1. Initiate, in 1998, what was originally to be a three year study of central Platte aquifers and their connections to surface water (Ring 1999). A cooperative hydrological study (COHYST), was launched to provide a data base for the design of Nebraska's recovery program projects, to provide policy makers essential information, to promote considered discussion among the many Nebraska water voices–agricultural, municipal, environmental, and industrial. Funded by several sources including the state, the Nebraska Environmental trust, USGS, the NRCS, and the University of Nebraska-Lincoln (See: www.cohyst.nrc.state.ne.us), the objective has been to identify gaps in existing data, gather data to fill gaps, and build a model of the Platte river and its interaction with groundwater. Nebraska water people knew that such an effort should have been made years earlier, but there was never support for such a project until the federally mandated recovery program loomed on the horizon and made it essential. It took the "crisis" of signing the 1997 agreement to get the study started. At this writing, the study team continues to work on its first public report for which the several audiences await. Meanwhile, until state decision-makers better understand its aquifers and its depletions requirement, they will be extremely careful about committing any significant fraction of groundwater to any federal habitat recovery program for birds and fish.

2. Announce, in 1998, that well installations after July 1, 1997 and up to the end of 2001 would have their depletions covered by the state. Just exactly how Nebraska would create mechanisms to offset the depletions was never clarified. After all, it is the NRD's that have statutory responsibility for groundwater management and it was not clear that leaders and memberships at that level were going to climb aboard any depletions program that had, at that point, never been thoroughly discussed and that ideologically many opposed. Owners of newly installed pumps were simply assured that somehow they would not individually owe an obligation to surface flows. It soon became apparent that the determination of groundwater users to expand their usage with added wells was creating a "run-away train" that could not be politically controlled by the conclusion of 2001, and–stepping back in the face of energetic well user opposition to control–state authorities at the January 2001 Governance Committee Meeting announced that they had extended the time period for state coverage of new well depletions until December 31, 2003. If an existing or new groundwater user could not, after six years of notice, get the necessary additional straws in the ground before January 1, 2004, they would be responsible on their own for their depletions.

Until mid-August, 2002, a draft depletions plan continued to make it clear that any new depletion to the river on or after January 1, 2004-- above Chapman, Nebraska–would have to be offset by the promoter. But new language then appeared to the effect that, if new NRD/user offsets were not sufficient to prevent increased shortages to target flows, the state would provide supplemental offset water in amounts, times, and places needed. The statement was an open admission that the state could not, or would not, compel Nebraska groundwater depleters to cover the full costs of their activities. The policy was, in effect, an open-ended commitment of the state treasury to cover escalating depletions of new Nebraska users.

The willingness of the state of Nebraska to promise use of the public purse to supply offsetting water for wells installed for over a six year span after the 1997 accord represented a considerable gift (side-payment) to groundwater users. The later statement that fudged even the December 31, 2003 deadline was testimony to the political power of the groundwater lobby. Obviously, the effort of the state was to communicate to the groundwater community that it was going to be well treated under Nebraska's depletions plan. If such largesse was to be shared with well owners, a basic sense of equity meant bringing new surface uses in under the same umbrella. First, like users in each of the states, all wells permitted prior to June 30, 1997 had their depletions covered by the recovery program. Then, the groundwater community was provided over six more years to install what it wanted on and after July 1, 1997 with assurance that the state somehow would provide offset water to the recovery program. Then, that final '03 deadline was softened with the promise of supplemental offsets for both groundwater and surface water users. All this backing up and willingness to spend public monies for private water exploitation was designed to satisfy leaders in the community who, in turn, would hopefully drop their opposition to the species habitat recovery program. Governor Johanns would then see a politically sustainable path to endorsement of the Platte River Cooperative Program. Would the state side-payment be sufficient to induce groundwater users to accept a program that CNPPID and NPPD desperately needed? The answer will be forthcoming.

One thing is, however, abundantly clear: the state financial and technical burden of finding offset water rises with each passing day. In a time of economic difficulty and shrinking state revenues, drought, and a depressed agricultural economy there is the distinct possibility that state legislators may turn away from the species recovery program just because of escalating costs of buying off opposition in the water communities.

Nebraska has been hard at work to create a plan to cope with depletions to groundwater based on the work of COHYST. Specifics will not be addressed here, but it is worth noting that a 2003 recovery program decision time looms while COHYST has yet to be sufficiently completed to sustain any particular set of depletions options. Yet, Nebraska must come to the table with some specifics soon. What are negotiators for the federal agencies and neighboring states to make of whatever depletions plan is put on the table, if Nebraska cannot demonstrate that their offset plans will work?

Nebraska Water Action Plan

With an eye on protecting its groundwater mounds to the maximum, Nebraska pieced together its contribution to the 60,000+ acre feet per year annual average flow that was needed to supplement the original 70,000 acre feet that had been put together by June, 1997.

CNPPID operates several reservoirs that would function as surface equivalents of Colorado's Tamarack. They would capture water at times of excess flows in the river and hold them until needed for release back to the river for program purposes (For all Nebraska water projects, see Boyle Engineering Corporation, 2000.) A combination of Central's reservoirs can be expected to yield an annual average of up to 8,000 acre feet of which 4,000-5,500 will be made available to the program. The remainder is to be held back by Nebraska as an asset for possible use in the state future depletions offset plan.

Another water re-timing effort is planned for the Dawson and Gothenburg canals located on the north side of the Platte River. The idea is to divert surface water directly from the Platte River into these canals during the non-irrigation seasons and then allow it to seep into the aquifer storage. During the irrigation season an equivalent amount will be available for irrigation pumping. That, in turn, means an equal amount of water does not have to be released from Lake McConaughy and can be directed to program objectives. Recharge at these two canals is estimated to produce about 1,800 acre feet of yield at the critical habitat.

Additional program water will come from water leasing similar to that proposed by Wyoming. The plan would rely on economic incentives to farmers who will annually lease their reservoir water allotments that would otherwise be used for irrigation. The consumptive use portion of the saved water would be stored in Lake McConaughy for release in ways that would serve program needs–i.e., at times of shortage at the critical habitat. It is intended to lease about 25,500 acre feet annually, which equates to a reduction of farm deliveries of about 17,000 acre feet/year, and a reduction in actual on-farm consumptive use of about 8,400 acre feet/year.

Nebraska also plans to employ program funds to create incentives that would encourage farmers to adopt conservation cropping, deficit irrigation, leaving land fallow, and improvements in on-farm water delivery and field application efficiencies. The general idea is that farmers with irrigation water stored in Lake McConaughy will be paid to reduce their water demand. These reductions in consumptive use will be saved in the lake and released when required. Conservation cropping means a shift from higher to lower water intensive crops and crop rotations. Deficit irrigation would mean that a given farmer, in exchange for a payment from the program, would cut back a fraction of water used. A reduction of, say, 6 inches/acre/year could cumulate to significant amounts of water remaining in McConaughy storage for the program. Some farmers may wish to leave their land fallow in exchange for a payment. Finally, there are areas where irrigation water applications generate return flows in patterns that either do not return to the river at all, or produce returns to areas of already troublesomely high water tables, or generate return flows below critical habitat. In these cases, and where the irrigation is near the critical habitat, Nebraska authorities will initiate voluntary programs to increase canal delivery and field application efficiencies. The saved water will then be made available to the program. Together, all these approaches are estimated to produce about 7,000 acre feet of re-regulated water for the habitat recovery program.

There are selected areas of high groundwater tables that the state of Nebraska wishes to explore for their potential to supply water to state future depletions plans. Authorities want to insure that there will be no "mining" of the groundwater (i.e. net loss), and wish to study matters carefully. Nebraska will reserve yield of these exploratory groundwater management areas (under the Phelps Canal system, the Reynold's and Robb Wetland, and other areas in Phelps and Kearney Counties) for its own offset program, but has declared that it could commit 1,400 acre feet (of 6,000 a.f./year expected yield) per year to program purposes. This represents the first and only potential contribution from central Nebraska's groundwater mound. There are two major methods of groundwater regulation that will be explored: a) active pumping from high groundwater tables and moving water to the river by ditches; and b) passive lowering of the groundwater table by paying farmers to dry-land farm every other year. In specified locations, return flows to the Platte are substantial but arrive at points below the critical habitat. A solution

is to install "cut-off" facilities to capture the return flows and re-direct them to the up stream end of critical habitat. These opportunities can be exploited south of Kearny and are expected to yield an average of 4,400 acre feet/year.

Finally, Nebraska plans to make a fraction of water available to the program that will come from power interference arrangements at Kingsley Dam and several smaller hydroelectric plants located downstream on Central's canals. This will entail making a cash payment to the electricity producer sufficient to change the pattern of water releases through turbines. There are at least two possibilities: a) by-pass water around the turbines to get it started on a path to critical habitat when generators have no need for it; or b) change the timing of the generation such that current is being produced at a time that it has less value on the grid. In general, at times of excess flow at the critical habitat, Central and NPPD would be compensated for holding back electricity production. All this has been expected to yield about 1,400 acre feet/year for the program.

CHAPTER THIRTEEN:
WYOMING'S NEGOTIATING INTERESTS–GET A LEMON, MAKE LEMONADE

Wyoming's boundaries encompass an ancient mountaintop–the geologic nucleus of North America. Colorado and Nebraska, by comparison, are geologic afterthoughts. Wyoming is the only state in the union where travelers entering the state by road from any direction must ascend. What is true for roads, however, does not apply to the North Platte river which begins in Colorado high mountain watersheds and then drops out of North Park, Colorado into Wyoming territory. The stream then continues north through Saratoga and then cuts though the most arid territory in any of the three states to a point near Casper where it makes a sweeping turn to the east and then southeast and exits to Nebraska just east of Torrington. The stream, like so many in the West, has been over-appropriated and has, thereby, provided one of the important stages for the working out of a basin-wide habitat recovery plan.

Struggles of Wyoming water users over federal permits at Grayrocks and Deer Creek were prolonged and bitter, but they were battles of the 1980's. What could push the local water communities and the state authorities into the 1994-1997 negotiations? Or, as one Wyoming representative put it: "How the hell could there be a 'federal action' requiring a consultation with the Fish and Wildlife Service when there was not specific new water facility proposal that users were advancing for review?" The answer, deeply frustrating to Wyoming water users, came to be formulated in two parts.

First, there was the failure of Wyoming water users to get ahead with a proposed Deer Creek reservoir, and that had left the city of Casper, along with other small municipalities on the N. Platte, without sufficient future water supply. However, another source of water was available for municipal purposes–i.e., restoration of lost storage at Pathfinder. But the Pathfinder option was a USBR project and clearly in the federal nexus. The need for replacing the stymied Deer Creek project drew Wyoming into the basin-wide discussions in the early 1990's. Second, Wyoming water users must face the certain prospect of future consultations with the FWS under Section 7 of the ESA regarding their federally funded and managed USBR projects. Described below, most of these facilities are large and impose major impacts. Without a viable habitat recovery program in place to provide coverage for Wyoming water facilities, the price tag for mitigating impacts to species habitat in central Nebraska could be breathtakingly high.

Some strategists in the environmental community, noting Wyoming's potential squeeze, have contemplated the possibility of staying away from program negotiations with the thought that without a viable program, Wyoming's reservoirs could be a source of much more water for environmental purposes than that which any foreseeable voluntary recovery program would extract. However, any such prospects for big shifts in water use would be more than a lifetime away. Therefore, more pragmatic environmental leaders have advocated working with Wyoming at the negotiating table.

When it came to pass that the Bureau adopted a revised mission that placed environmental water stewardship as a higher priority, and when the USFWS requested ESA Section 7 consultations with the Army Corps of Engineers over plans at Deer Creek (involving a Clean Water Act Section 404 permit) in the name of endangered species on the central Platte river, there

was little that Wyoming water users could do but succumb. To their dismay, water users began to see an unwelcome two-headed specter on their horizon: 1) any new project water supply could be "extorted" by the federal recovery program agenda; and 2) there was the real prospect that significant fractions of "old" water (possibly in the range of 10-20%) appropriated by the state in perpetuity to long standing USBR projects could be shifted to environmental purposes in central Nebraska--a frightening prospect!

It is worth noting that water users in western Nebraska are also North Platte Project beneficiaries and share Wyoming fears because they receive about 80% of Pathfinder water as well as 62.5% of irrigation supplies from Glendo. Upon contemplating the potential devastation that such losses would impose on Wyoming agriculture and cities (and by extension their neighbors in western Nebraska), Wyoming water users found themselves in the middle of what was to become a three-state-federal negotiation to create a basin-wide solution. Individual project users could not bear the costs of addressing critical habitat requirements downstream. Like everybody else in Nebraska and Colorado, they too saw joining the negotiations as a means to get a better deal than the Biological Opinion's 417,000 acre foot/year target flow figure would impose in any individual Section 7 consultations.. There was the prospect, shared by virtually all in the water communities, that the federal recovery program's adaptive management efforts would shave the water requirement back to 130-150,000 acre feet/year, and maybe new approaches would be found in years to come that would take care of the critical habitat without calling for even that much. Wyoming's situation then, under a viable proposed program, could be expected to be a "good deal" as compared to virtually anything that could be expected without a negotiated recovery program.

Just as in Nebraska and Colorado, Wyoming water planning was changing quickly and drastically. Old style water planning, before the threat of ESA Section 7 consultations, was about dams, reservoirs, and water conveyance systems--their construction, operation, maintenance, and rehabilitation. Now the issues had shifted to a new kind of planning for water re-regulation for purposes of wildlife habitat downstream of state boundaries. What could Wyoming users do with what they regarded the "lemons" handed them? How could they contribute water to the recovery program and yet keep to a minimum any impact on the historic inter-state allocation of North Platte water as between Wyoming and Nebraska?

Nebraska v. Wyoming

Some water users went to the Wyoming authorities in the early 1980's with a proposal for a dam and a 66,000 acre foot storage reservoir at a location on Deer Creek, a stream tributary to the North Platte at a point southeast of Casper. The plan was to serve Casper's water needs via an exchange whereby the city would take upstream water out of priority, and then pay back the senior appropriators out of Casper's water at Deer Creek. There were soon two problems. First, the promoters went into a Section 7 consultation with the Fish and Wildlife Service and were to learn that the proposal did not contain an adequate "reasonable and prudent" alternative to deliver water to designated critical habitat in central Nebraska. Second, in 1986, Nebraska authorities filed a lawsuit against Wyoming alleging that Wyoming was wrongly capturing flows from tributaries to the North Platte in violation of a 1945 U.S. Supreme Court decree. In that litigation, Wyoming's Deer Creek proposal was simply one of several points of contention.

The Nebraska v. Wyoming lawsuit would drag on for years and pose problems for Platte River Recovery negotiations. Open discourse would be difficult; the sharing of data was a risky proposition for either adversary. Negotiators working on behalf of each state found themselves in a difficult position with their respective state legislators. On the one hand they had to go hat-in-hand seeking financing to prepare their legal cases. On the other hand, each had to simultaneously go to their same legislators seeking dollars to fund a cooperative agreement that would not only require holding hands with the federal agencies and their environmental agenda but also with their adversary–all this without knowing the impact of the eventual cooperative agreement on the lawsuit or the meaning of the lawsuit for the eventual 1997 collaborative understanding. It was all extremely awkward. How could either party make commitments to the recovery program without understanding the final outcome of the legal battle?

In 1934, in the context of the great depression and severe drought on the high plains, Wyoming water users held back as much water as possible in Wyoming reservoirs and thereby earned the enmity of downstream Nebraska irrigators. The case went to the U.S. Supreme Court in 1934 but was not decided until 1945 (Rundquist 1993); (Weiss and Montgomery 1999). The court ruled that Wyoming should allow 75% of the natural river flow to go to Nebraska during irrigation season, but did not address the issue of usage along the tributaries in Wyoming, nor did it satisfactorily address issues pertaining to what would become growth of groundwater exploitation. In the decades that followed, Wyoming water users installed water facilities on tributaries to the main stem, they proposed to build water catchments at Deer Creek and Greyrocks, and they spurred the growth of some hundreds of wells upstream of the Nebraska border. All of this either interfered with–or threatened to interfere with–the 1945 adjudicated split. The 1945 Supreme Court decision could not stand in Nebraska's eyes and would have to be re-opened.

Nebraska filed suit in 1986, petitioning the U.S. Supreme Court to enforce its 1945 decree apportioning surface water (75% for Nebraska) of the North Platte between Whalen and the Tri-State Diversion Dams during irrigation season. Nebraska argued that existing and threatened tributary water facility construction–including Deer Creek Dam and Grayrocks–was inconsistent with the 1945 ruling. It also fought long and hard to assert that Wyoming activities caused injury to wildlife and other environmental interests in Nebraska. Since there is a federal mandate to require Nebraska's water to be allocated to endangered species habitat, any increase in water use by Wyoming would injure Nebraska's capacity to comply with Endangered Species Act regulatory actions. Wyoming, for its part, claimed that the 1945 settlement did not prevent them from placing additional consumptive uses on tributaries to the North Platte such as Deer Creek and the Laramie river.

At the extremes, Nebraska contended that its 1945 apportionment froze Wyoming's depletions at their 1945 levels. Wyoming countered that its users could put on new depletions at will as long as the express injunctions in the 1945 decree were not transgressed. But neither adversary could long contend for the extremes and began to find more middle ground. The case was argued in subtle and multi-faceted ways that will not be traced here. A glimmer of insight can be gained into challenges for each side by noting that, after years of expensive pre-trial maneuvering, when Nebraska's team made a discovery trip to Wyoming in April, 1999, Wyoming produced and sent to its adversary over one million pieces of material. Then, after 15 years of

litigation costing the two states about $20 million, in March, 2001 the parties agreed to an out-of court settlement, quite literally on the courthouse steps in Pasadena, California on the day that the case was to go to trial. The following November, the U.S. Supreme Court approved the deal which had followed the recommendations of the Court appointed Special Master (Olphin 2001).

Fundamentally, the agreement specified that Wyoming will administer its water rights in accordance with the basic 1945 decree, but with modifications that included additional enforcement provisions. Nebraska had asked Wyoming to cut back its North Platte river water users to 1930 levels, and pay Nebraska $100 million in damages. Under terms of the 300+ page settlement however, no Wyoming users were cut off (some uses will be curtailed), and the state was not obligated to pay anything. However, the states agreed to form a North Platte Decree Committee made up of water officials from the USBR, Wyoming, Nebraska, and Colorado (river headwater state). This unit would provide a conflict management forum. Nebraska got greater certainty that Wyoming will administer North Platte rights in accordance with the 1945 decree. Nebraska accepted the reality that Grayrocks dam and reservoir had been completed on the Laramie river and endorsed the proposed restoration at Pathfinder that would serve both endangered species in Nebraska and the city of Casper. Wyoming accepted the fact that its plans for Deer Creek had been stopped. Since Wyoming had protected its existing users and Nebraska had gotten clarification of its rights to North Platte water in a way that effectively capped any new Wyoming summer season water uses, each side claimed victory.

As observers close to the case were quick to note, the essential meaning of the Nebraska-Wyoming settlement of 2001 was that there would be no further net expansion of Wyoming consumptive water uses. Future water activities can only be served if water is transferred from one use to another, most likely from agriculture to urban and industrial. As all of this was coming into focus over the years, it became clear that Deer Creek would not be constructed. But, then, how could Wyoming serve Casper's increasing water demand?

Lemonade

Wyoming water people would find ways to address some strategic local problems within the framework of constructing its contribution to the collaborative species recovery program. Wyoming has the smallest population and one of the smallest economies of any of the 50 states but its North Platte water facilities, primarily serving high plains agriculture, impose massive impacts on the river and the lower main stem. From a state perspective, given its potentially considerable liability, it would not be the best idea to go into individual project consultations under Section 7 of the ESA without a basin-wide cooperative habitat recovery program. In such a program Wyoming's water and dollar contribution would be supplemented by contributions from the federal treasury and two other basin states.

Pathfinder dam and reservoir stands at the center of Wyoming's contribution (Boyle Engineering Corporation 2000). Completed in 1909, and served by a 1904 water right, it is located about 47 miles southwest of Casper on the North Platte just below the mouth of the Sweetwater river. The Wyoming proposal is to restore 54,000 acre feet of storage capacity lost to years of sedimentation. Of that amount, 34,000 acre feet of that restored storage capacity will be dedicated to an environmental account serving the needs of the recovery program. The Program

Environmental Account Manager, operating at Nebraska's Lake McConaughy, will then have a considerable quantity of water upon which to call in upstream Wyoming. (See Table 2.) The anticipated average annual yield from the Pathfinder environmental account is estimated to be roughly half of the stored water in the account or 17,000 acre feet. Of that amount about 10-12,000 acre feet are expected to flow past the Wyoming-Nebraska state line. Pathfinder's water, with its 1904 priority, can handily be moved by USBR managers to any of the major North Platte tubs (e.g., Seminoe, Glendo, and Guernsey in Wyoming, and lakes Minitare and Alice in Nebraska). Much intra-North Platte water basin trading has always taken place on behalf of agriculture; now if a recovery program can be created it will be possible to employ the trading mechanisms on behalf of Nebraska species habitat under the direction of the Program Environmental Account Manager at Lake McConaughy.

Because Pathfinder, for years after its construction, was the most upstream dam on the river, it served as a sediment trap. The high mountain streams that filled it for the most part did not have particularly erodible stream beds. Yet, with each spring run-off after gates were closed at Pathfinder dam in 1909, storage capacity was incrementally lost to the particulates that fall out of stilled water. Although the rate of sedimentation was much reduced after Seminoe Reservoir was built upstream in the years 1936 to 1939, by the early 1990's calculations showed a 54,000 acre foot loss of storage capacity at Pathfinder. Restored capacity there would be filled under Wyoming's 1904 priority (See Table 2).

The remaining 20,000 acre-feet of re-captured Pathfinder storage will serve municipal uses of several North Platte communities, especially the city of Casper. Loss of the ill-fated Deer Creek option will be nicely compensated thereby. That total municipal storage account has been estimated to sustain a firm annual yield (as distinguished from average yield) of 9,600 acre feet per year for urban use after which most water will flow back into the river for other users in Wyoming and Nebraska. In any given year, if the urban demand is less than 9,600 acre feet, Wyoming at its discretion will be able release the remainder in ways that will benefit the recovery of critical habitat on the Central Platte.

Glendo Dam and reservoir is located on the North Platte river about 75 miles downstream of Casper and about 60 river miles above the Nebraska border (See Table 1). Glendo is a large reservoir mostly dedicated to flood control but 40,000 acre feet are designated during any water year for irrigation of: a) Wyoming lands below Guernsey Reservoir (15,000 acre feet); and b) lands in the Western Nebraska panhandle (25,000 acre feet) (Water and Power Resources Service 1981). Of Wyoming's 15,000 acre feet, 4,400 are permanently contracted to users, thereby leaving 10,600 acre feet of temporarily contracted storage available in Glendo for a Wyoming contribution to the basin recovery program. Wyoming plans to make a permanent contract with the USBR for this storage space from which it estimates that it should collect and deliver 2,650 acre feet of water in an average water year. Since this is a relatively small quantity, it is likely that–in most circumstances–the Environmental Account Manager at McConaughy will want to minimize conveyance losses by transferring Wyoming Glendo water to McConaughy as part of the larger quantities to be annually transferred down from Pathfinder.

Another 5,000 acre feet of water is available for Wyoming donation from LaPrele reservoir located on a tributary to the North Platte by the same name where the water would enter

Table 1 Selected Wyoming North Platte Basin Water Facilities

Name	Project	Priority	Storage Capacity (Acre Ft.)	
Seminoe	Kendrick	12-1-1931	Permitted:	1,026,360
			Current:	1,017,273
Kortes	Pick-Sloan Missouri Basin	9-11-1933	Permitted:	4,640
			Current:	4,739
Pathfinder	North Platte	21-6-1904	Permitted:	1,070,000
			Current:	1,016,507
Alcova	Kendrick	4-25-1936	Permitted:	184,295
			Current:	184,405
Glendo	Pick-Sloan Missouri Basin	8-30-1951	Permitted:	800,000
			Current:	789,402
Guernsey	North Platte	4-20-1923	Permitted:	71,040
			Current:	45,612

Source: USBR, North Platte Basin Reference Map March 31, 1987. Casper, WY. No. 20-703-5199.

the main stem about 125 miles downstream of Pathfinder. There are a complicated set of considerations that make yield estimates problematic but releases can be nicely timed to meet the requirements of the program Environmental Account Manager. In addition, Wyoming's water contribution will be enlarged by a program of voluntary water leasing. This part of the Wyoming effort would provide state incentives to farmers to annually lease water supplies that would otherwise have been dedicated to irrigated agriculture. The recovery program would receive that component of the leased water that represents the actual reduction in crop consumptive use (thereby preserving the return flow fraction and preventing injury to appropriators who have become dependent upon such flows from neighboring irrigators). The program will lease rights to water in storage reservoirs and that, therefore, can be easily sent downstream to meet critical habitat needs. It is estimated that leasing about 22,700 acre feet annually, will correspond to about 16,400 acre feet delivered to farms, and–in turn–amount to about 8,200 acre feet of historical consumptive use reduction that can be made available to the recovery program.

Wyoming Side Payments

State authorities have worked with local irrigators and federal agencies on two local problems in ways that have helped farmers in irrigation communities make peace with the proposed habitat recovery program. First, in the Kendrick Project there is a serious problem created by the fact that some project water, after irrigating certain areas, moves into naturally occurring selenium deposits that then become a highly toxic wetland soup threatening to migratory waterfowl. In most instances, the wetlands were created by artificial barriers built by irrigators decades ago to capture runoff. Breaking down the barriers and drying up the artificial wetlands would not pose much of a technical challenge, but it does pose some difficult legal problems in the context of federal environmental legislation. The state of Wyoming has committed itself to working with the irrigators and with federal authorities to address the problem.

Second, farmers up and down the Wyoming North Platte are being kept on board the recovery program because authorities are working closely with irrigation districts confronted by varying but significant dam safety problems. None of the districts are operating dams that can fully pass muster as required by the federal Safety of Dams Act, which–among other things–establishes high standards for a qualifying dam to be able to contain maximum probable flows. A world of low agricultural commodity prices, combined with escalating costs for farm inputs, is not conducive to the aggregation of large amounts of capital in irrigation district budgets. Considerable fractions of the large sums required to rehabilitate dams to fulfill federal standards will have to come from sources other than the district water allotment holders. Money is available from the Wyoming Water Development Program (funded by state mineral severance taxes), but work on dams that have been built by the USBR must fulfill review standards by federal authorities in the USBR. That, in turn, means consultation with the Fish and Wildlife Service which, of course, means doing things in a manner consistent with the objectives of the basin-wide endangered species recovery program. The quid pro quo is clear; support recovery of habitat for three birds and one fish and, in turn, gain access to the resources needed to address some very important dam safety problems.

All of this makes for water user willingness to lower their resistence to the state of Wyoming plan to contribute to a successful habitat recovery program. Since the USBR virtually operates the river from Seminoe Reservoir downstream, it can send Wyoming's program water to the Nebraska border under a high degree of control. Furthermore, users are beneficiaries from a state of Wyoming investment in restoring long lost capacity in Pathfinder. They see a municipal account being proposed that would nicely make up for the lost Deer Creek facility, and they know that urban return flows will enlarge downstream flows. Also, some fraction of environmental program flows will be caught and delayed for Wyoming's benefit in river bank storage, a momentary loss to the program that would be a gain for local users in the right locations. Issues of selenium toxicity and dam safety, which could be overwhelming for those impacted can be addressed with state and federal resources. Many recovery program costs will be shifted to state taxpayers. Farmers who have irrigation water in the appropriate storage facilities, can lease out whatever fractions of their water they wish on a willing lessor/lessee basis. All in all, when many looked at the details of what had been a most unwanted federally mandated basin recovery program, they found it not to be so objectionable after all. Actually, for many, it represented real

improvement in their prospects.

A Pinch of Sourness

Some irrigators working in Wyoming's upper North Platte Valley–above Seminoe--have been displeased with the proposed arrangement at Pathfinder. Some joined opponents of the recovery program in Nebraska, most especially supporters of Nebraska First. Some were participants in overt protest that occurred in the months following mid-1997 establishment the Governance, Land, and Water Committees. (See Chapter 17.) Objections arose from farmers who operate in a range of circumstances, but many came from those with surface stream priorities junior to Pathfinder (1904). Such users have, for decades, worked with their river commissioner to take their water out of priority and then arrange to pay back their senior river priority creditors with water that they own at Pathfinder–a classic water exchange. Some others in the same area who objected strenuously to the proposed program implications have possessed senior priorities and good water supply situations but simply objected to accepting any risk that their priorities would be at all compromised by the proposed Pathfinder environmental storage right.

Seminoe reservoir, located just upstream of Pathfinder, has a late 1931 priority on the river (See Table 2), and that junior date means that it cannot store water in average to dry years--i.e., most years. Therefore, state and federal officials do not want to store endangered species habitat program water there. They want storage under the 1904 priority that rides with the Pathfinder facility. Many upper valley water users oppose the insertion of a federal environmental water claim that was hammered out in the 1990's into a reservoir of fixed capacity knowing that the environmental right will be fully exercised each year. By annually draining the water needed to serve this new federal environmental need (which would ride on the original 1904 Pathfinder priority), the demands of the recovery program's environmental account manager would at least potentially represent a threat to much more senior Wyoming rights. The more junior the Wyoming user right, the greater the jeopardy–i.e., the greater the likelihood that, after the federal recovery program is served, there will be no water remaining to serve traditional Wyoming priorities even though they are many years senior to the late twentieth century arrangement for federal habitat recovery program water.

In wet years, all this will be moot; there will be water enough to go around. However, Seminoe dam and reservoir will be squeezed in dry years. Some major fraction of the 54,000 acre feet for municipal and environmental accounts in the restored Pathfinder would have, prior to the habitat recovery program, gone to Seminoe accounts and contributed to serving more junior priorities there. It is easy for at least some of these upper valley irrigators to imagine a drought scenario in which depleted Seminoe and Pathfinder reservoirs will not have enough capacity to serve all right holders; at that unhappy moment it will not be the most junior federal environmental storage claim that will be cut off under terms of the proposed program. In a series of dry years, the constant drawing down of the full environmental account at Pathfinder will inevitably push state juniors in order of priority out of storage, successively nudging aside higher and higher Wyoming user priorities in a shrinking tub.

Upper valley water users argue that the Wyoming junior right holders at Pathfinder (still much senior to the 1997 federal program demand) must never be placed in jeopardy by the federal

program. They see water being squeezed away from upper North Platte users by the expedient of filling the enlarged Pathfinder tub with upper valley water. Then, however, rather than let upper valley users get access to their water under their priorities for exchange with senior appropriators downstream, in sufficiently dry years their exchange water will flow to the environmental and municipal accounts. A transfer of welfare will have taken place from the upper to lower valley interests in ways not sanctioned by Wyoming state appropriation doctrine.

Some upper valley users have proposed a solution. Let all inflows to Pathfinder be counted as agricultural water for traditional uses up to the 1.16 million acre foot level–the capacity available before the reservoir restoration. Only after that quantity has been assured will in-flows be counted toward the 54,000 acre feet of water for the municipal and federal accounts. This, of course, would insure that the traditional user priorities would be protected at the possible expense of water for the federal recovery program. But, state and federal authorities have so far shown little interest in formalizing any such arrangement.

State and federal representatives have replied that the "resisters" are seeing a problem that does not really exist. They argue that restoration of Pathfinder's capacity from 1,016, 000 to 1,070,000 acre feet cannot hurt upper valley irrigators. They contend that the state would never make a call on the upper valley to furnish the 54,000 acre feet of expanded Pathfinder volume by shutting down upper valley users with priorities senior to Pathfinder. They would, rather, simply regulate the upper valley users to their traditional diversions and to their long standing Pathfinder exchanges that fit the smaller pre-modified reservoir. This is a roundabout way of saying that the state promises to respect the traditional consumptive uses of the upper valley users. Upper valley opponents reply that unless the state can insure that there will never again be prolonged drought, there will no place to obtain the water for the 1997 federal environmental account priority except by subordinating and extracting the water from state priorities that are senior to that of the program. They simply do not trust the state of Wyoming to keep its word never to compromise a state priority given the intense pressures that can be expected to fall on federal and state authorities during a time of prolonged drought.

State and federal representatives point out that upper valley irrigators will eventually face federal permitting issues on their water supply sources high in the Medicine Bow National Forest and on Bureau of Land Management (BLM) lands. At that moment, they too, will be in a federal nexus and will benefit from a successful basin-wide habitat recovery program. In the short run, they are advised to accept the risk inherent in the Pathfinder plan. In the long run they will be better off.

CHAPTER FOURTEEN:
STATES AND FEDERAL AGENCIES

In the preceding discussion, the Federal Department of Interior presence has been relegated to the background. Obviously, representatives of the USFWS and USBR/EIS team were continuously active in discussions with each other, the states, environmentalists, and basin water users. Federal decision-makers and their staff members were promoting the construction of a proposed "reasonable and prudent alternative" in many ways by making contributions to organization of the recovery program, addressing terrestrial habitat issues, and developing a plan for research and monitoring. Some important aspects of all this will be addressed in the following chapters, but federal authorities played at least two critical parts in support of negotiations and bringing them to a point that, by fall of 2000, a water action plan had been pieced together.

First, and foremost, the USFWS kept up a clear, but intermittent, drumbeat to the effect that the Endangered Species Act had to be implemented and, should efforts fail, there would be re-initiation of individual Section 7 consultations. There is no question that without a strong federal presence working on behalf of a toughly written ESA, the water user community would never have sustained minimal interest in talks. The quest for regulatory certainty by Platte river basin water appropriators was what kept them at the table, seats at which they would have gladly abandoned if they had viable options other than to act in concert.

The question that arises is how to best employ the ESA hammer? When, how much, and under what circumstances, should the threat of returning to individual consultations be employed? When does a responsible federal administrator threaten, cajole, or back off? When are lapses in forward motion a sign that the federal hammer is needed and when it is signaling absolutely essential backstage talk within and among the states. How is one to know stalling from spadework?

The most dramatic instance of threatening the ESA hammer, one that went beyond the negotiating rooms, was in April, 2000, in the context of an emergent water action plan, a land habitat plan and species monitoring protocols that had put specifics on the table in anticipation of a December signing of the recovery program agreement. Farmers, especially in Nebraska, were restless and sending signals of opposition. Farmers in all three states, but again especially in Nebraska, were listening to a daily barrage of conservative talk radio lambasting the Clinton Administration and a litany of unwanted federal intrusions without mentioning the federal dollars that were sustaining agriculture. Politicians, again especially in Nebraska, were nervous. Things looked much more positive for the recovery program in Colorado and Wyoming, but with the clock ticking its way to a December deadline, and with the possibility that a Republican presidential candidate might well win the November elections, a question emerged: would Nebraska bolt away from all that had been accomplished? Furthermore, there was limited time to get a draft agreement together, there was a failure at that moment to have sufficient water on the table, and states were haggling over what, in the FWS eyes at least, was a more peripheral issue of federal forest management strategies the last century and how they had reduced water flows to the basin.

In this context, Ralph Morgenweck, Regional Director of the USFWS in Lakewood,

Colorado, conducted an interview on April 25 with a reporter from the Omaha World-Herald. The message was published the next day which neatly coincided with a scheduled Governance Committee meeting where it was read to a roomful of silent negotiators and their staff people. Morgenweck spelled out for readers across the state the "nightmare" of the no-action alternative. All people involved in federal programs–ranging from flood control to commodity price supports, municipal water supply systems, rural electrification cooperatives, soil and water conservation programs–could be accountable for compliance with the ESA. Individually they would be required to make appropriate forms of contribution to improved habitat for the listed species. All entities receiving federal permits or payments would have to be judged individually as to whether they were in compliance with the ESA. However, if the proposed recovery program could serve as a "reasonable and prudent alternative" (to either forcing thousands of entities into compliance or shutting them down), then such difficulties would disappear. The specter of federal authorities establishing "standards" for beneficiaries of federal dollars and attempting to enforce the law enterprise by enterprise across three states of the basin was horrible to contemplate for any party–local, state, or federal. The only way out, Morgenweck made clear, was to support the recovery program process. Failure carried a high price. Any reader got the message that people could no longer simply write off the program as important to two Nebraska districts or other remote water users. Program failure would hit home where people lived, worked, and played.

No one can know the impact that the published interview had as it was picked up at breakfast tables and office desks by political elites and organizational managements across the state and around the basin. Yet, it could not be lost on Nebraska leaders that Morgenweck had made certain it was published in their state's leading newspaper. Political elites, and their attentive audiences, had the debate framed for them in a manner that could not be blithely dismissed. On the one hand pressures from important water constituencies mounted to "pull out" of the talks rather than tolerate FWS "blackmail." On the other hand, the message had to give some important political cover to any governor who was looking for reasons to stay in the conversation at least for a while. In the event, neither Nebraska nor any other state delegation left the negotiations. There was to be no signed agreement in December of 2000 as originally scheduled, but the reason would have to do with a problem that DOI itself would advance–issues of sedimentation and vegetation in the central Platte channels (See Chapter 18).

Representatives of the USBR/EIS team and the FWS also played a critical role in a second sense. Many state organizational water staff are inveterate data analysts and model builders. But federal agency staff are these things also. State and local models of specific segments of the basin critical to water administration were important to recovery program discussions, but only the BOR/EIS team, operating collaboratively with the FWS and with state representatives to the program's water committee had constructed an over-all basin model that could be used to evaluate the proposed recovery program, and alternatives to it, with a view toward determining how much combined state water projects in the action plan would reduce shortages to the controversial target flows. Only the federal EIS team had a model that could claim to reveal how the pattern of diversions and releases from the program would affect critical habitat. EIS team basin modeling, and water volume scoring methods, were of intense interest to all and became the focus of much discussion that brought technically adept professionals together across state lines and bridged gaps between locals and federal government analysts.

The BOR/EIS team's model had been developed in the 1970's as a generic river model. It had been modified and developed for purposes of the FERC re-licensing process at Kingsley Dam and Lake McConaughy in the 1980's–90's. Given the fact that it had been closely scrutinized by a combination of federal, state, and local groups including environmentalists, and given that it had been "cleaned-up" and made more user-friendly over the years, it was the tool of choice for evaluating the proposed recovery program. It was basically an accounting model that tracked inflows and outflows along the rivers from the Julesburg gauge in Colorado at the Nebraska state line downstream to the main stem and from Kingsley Dam through the critical habitat. The model employed time-series data reflecting current conditions on the river and then analytical "runs" were made each with a selected proposed program change to see how it would affect the river. Validity was checked by comparing observed results of model runs with re-creation of known historical flow conditions.

Many times, when policy talk became animated, confrontational, and potentially explosive, sending matters back to the technical level provided at least temporary escape. Policy people, heading back home after rough sessions, would hear from their technical people that maybe there were ways of coping that emerged in technical level discussions driven by the river model. It also worked in reverse, when technical discourse bogged down, staff could seek direction from policy people in a data rich context. Data analysis and modeling activities of state and federal teams was central to the shifting of discourse back and forth, and the federal EIS team modeling efforts were critical to the dynamic.

A crucially important example of interaction between technical and political-policy discourse was to be seen in the difficult negotiations leading up to completion of the water action plan. Taken together, the three states had come up with an assembly of river re-regulation projects that were estimated to yield an annual average of 130-140,000 acre feet deliverable to the critical habitat as measured at the Grand Island gauge (See Table 2). The recovery program EIS team, working in support of the USFWS, conducted its own investigation of each action plan component. The team's modeling effort arrived at a figure for the combined production of all state projects of 144,000 acre feet/year at a time when states were desperately casting around looking for water projects to contribute. It was quite possible that the EIS team could have taken a much more hostile view of the situation and employed the inevitable error in such modeling efforts in ways that could have diminished the impact of the state project inventories. The fact that the EIS team took a more generous view was happily received by the states.

The federal team had established itself as willing to work the "gray areas" in a friendly rather than hostile manner. Some local observers viewed the BOR/EIS team's willingness to generously re-score state water action plan projects as tacit acknowledgment that the issue of improved habitat was not really hinging on water volumes per se. Therefore, the states saw in the federal re-scoring an appreciated flexibility and good will. After discussion, all parties agreed that the uncertainties and error-terms involved in the analysis made it prudent to declare that the proposed combination of projects would yield something in the range of 130-140,000 acre feet/year, more than sufficient to fulfill the 1997 understanding that there would be reductions in shortages to target flows averaging 130-150,000 acre feet /year. Table 1 summarizes state contributions to the proposed program's water action plan.

Table 2 Program Water Sources

Water Sources Negotiated 1994-1997	**State**	**Estimated Shortage Reduction Critical Habitat (ac-ft)**
Env. Acct at Lake McConaughy	Nebraska	44,000
Pathfinder Dam Expansion	Wyoming	26,000
Tamarack Groundwater Recharge Plan	Colorado	10,000
Subtotal/Average for Water Sources Negotiated from 1994-1997		*80,000*
Water Sources Negotiated 1997-2000	**State**	**Estimated Yield at Critical Habitat (ac-ft)**
CNPPID Regulating Reservoir (min. yield)	Nebraska	DOI's operational study model assessed Nebraska and Wyoming projects in interaction. Therefore, no individual project reduction and shortage values are reported here.
CNPPID Regulating Reservoir (max. yield)	Nebraska	
Water Leasing	Nebraska	
Water Management Practices	Nebraska	
Ground Water Management Active Pumping	Nebraska	
North Dry Creek/Fort Kearny Cutoffs Lost Creek/North Dry Creek Cutoff Lost Creek/Ft. Kearny IPA Cutoff	Nebraska	
Dawson/Gothenburg Canal Ground Water Recharge Gothenburg Canal Ground Water Recharge Dawson Canal Ground Water Recharge	Nebraska	
Power Interference	Nebraska	
Net Controllable Conserved Water	Nebraska	
Net Controllable Conserved Water	Nebraska	
Pathfinder Municipal Account	Wyoming	
Glendo Storage	Wyoming	
Water Leasing	Wyoming	
LaPrele Reservoir	Wyoming	
Subtotal of Wyoming and Nebraska Projects in Interaction		*33,000 - 43,000*
Ground Water Management (Tamarack)	Colorado	17,000
Subtotal/Average for Water Sources Negotiated from 1997-2000		*50,000 - 60,000*
Total/Average for Water Sources Negotiated from 1994-2000		**130,000 - 140,000**

Individual water supply project yields will not be produced in isolation. Rather, they interact in ways that may either add to, or subtract from, total program yields. There can be no simple linear cumulation and addition of individual project supplies. Therefore, Table 1 reports only general sub-totals and the estimated over-all total program yield.

Federal representatives were, therefore, much more than taskmasters threatening to bring the ESA down on the heads of recalcitrant state water users. They were, among other things, becoming partners in data analysis and modeling of complex aspects of the basin water flow. People who had come to the problems of water re-regulation from different perspectives shared the same concepts that organized data analysis and interpretation, they worked with models constructed out of common educational backgrounds and had the same respect for shared logics. And when the federal team had its choice to make it more or less difficult for the states to reach their water action plan goals, the feds had chosen a course of conservative moderation. An analytical coalition among states and federal agencies that had been gestating for 5-6 years had been birthed in the form of a water supply action plan that had earned a passing grade in the federal assessment.

PART V ROLES OF SCIENCE

CHAPTER FIFTEEN: DEFINING SUCCESS–SCIENCE AS REFEREE IN A GAME WHERE NO ONE KNOWS THE SCORE

The three states and Department of Interior signed onto the 1997 Cooperative Agreement on the premise that they would find ways to negotiate a program rooted in good peer-reviewed science. It has been a noble but deeply problematic vision. How do program participants balance today's need for immediate action on behalf of listed species, and the need to do further study to understand habitat requirements? What are the observable indicators that can establish the program is, or is not, working? Who gets to define those indicators and the criteria for assessing progress? The USFWS is statutorily responsible for determining whether or not the program has served as a reasonable and prudent alternative, but what is the status of state critique? Who will pay the considerable costs of doing good science in a complex world that is always richer than the simplifications captured by theoretical and methodological models? When important things remain unclear after time and money is expended in the quest for understanding, who will bear the burdens of uncertainty–species habitat or water users? The ESA clearly places the burdens of uncertainly upon human society–not the species–and that is the glory of what has come to be known as the most important and powerful environmental legislation the world has seen Yet, everybody knows that the FWS has limited means to protect species, and if it pushes too hard, the Act itself will become politically endangered. The promise of "regulatory certainty" has been the bait the USFWS has used to keep water users at the table, but how can that concept be meshed with inevitable scientific uncertainty and dynamic ecosystems?

The USFWS unquestionably has the authority under the ESA to function as the referee who blows the whistle when state actions are found to be deficient, but when is that federal call based on sound scientific understanding, and when is it little more than arbitrary and capricious dictate reflecting agency political, legal, and other non-scientifically grounded requirements that come and go with the passing of administrations, middle level managers, fad, and fashion? These issues, along with more technical matters, were primarily addressed by members of the Recovery Program's Technical Committee–an advisory group organized to make recommendations on matters of program monitoring and evaluation to the Governance Committee.

Program Objective

At a basic level the program objective seems simple enough. Benefits for species in the form of improved habitat must be made sufficient to insure that the designated area of the Platte river does not impede recovery of the listed species. If the program succeeds in accomplishing that, and if that success is underpinned by solid scientifically based efforts at research and monitoring, it should be passed as a reasonable and prudent alternative to shutting down or modifying water projects in the basin that have "taken" habitat of listed species. End of story.

Unfortunately, analysts do not know very precisely how to justifiably define required baseline conditions on the river. Although biologists have a good grasp of many fundamental considerations in defining habitat requirements of the three listed birds, no one has a complete

picture as to how the birds used the traditional habitat and exactly which aspects are critical and which are not. What kind of habitat does the program want to produce over the next 13 to 50 to100 years? The problem of defining "best habitat" is complex in many ways not addressed here. One thing that is clear is that over the last 30 years mainstream ecologists have largely abandoned any assumption that nature–in the absence of modern humankind–would somehow be self-regulating in the direction of some "natural" standard of stability or equilibrium (Wood 1998), (Krech 1999). "Pristine environment" is a deeply problematic concept and has no justifiable meaning for guiding program criteria of success.

The central Platte critical habitat is only one link in a large continental complex of ecosystems that sustain the whooping crane. The future of that species will depend heavily upon what happens from the Texas gulf coast, in prairie pothole country of the Dakotas, and in the Northwest Territories of Canada. Even if habitat on the Platte were to be somehow restored to conditions ideal for the species, forces at work many other places could easily account for their extinction. It is possible to have a raging success, however defined, on the critical habitat and suffer loss of the targeted birds. Can the recovery program be given good marks when, over time, the population of listed cranes is declining?

What will the definition of program success be? There are too many variables affecting the rise or decline of whooping cranes, piping plovers, least terns, and pallid sturgeon that are beyond the control of the recovery program. Should the program limit itself to establishing that the habitat is not a factor responsible for species decline, or should the monitoring and research program be much more ambitious and attempt to establish that the listed species are actually recovering? There are deep epistemological problems here (Gerber, DeMaster, and Roberts 2000). How can science determine, with any certainty, when a population has recovered? The mere fact that a population increases over a given time period does not necessarily indicate that the species is on the road to sustained recovery. If the numbers should fall over a 20 year period, it does not necessarily mean that–given our limited knowledge of particular species biology and habitat requirements–that program manipulations are necessarily causing the problem.

Uncertainty about the linkage of action and species response is inevitable; the domain for legitimate disagreement among thoughtful and knowledgeable scientists is large. Real world action programs implemented as quasi-experiments take decades–arguably centuries–to have the desired impact. Given the number of uncontrolled variables, science may not even then be in a position to establish clear-cut connections between policy action and biological response.

If the program cannot simply count up numbers of birds and fish, what can it do? The USFWS begins by acknowledging that the Platte River Recovery Program is to **assist** in species recovery. It will not be held accountable for recovering the listed species *per se.* The awkward fact is that the ESA places people and ecosystems in its grasp not because they add up to viable ecological management domains that can be manipulated in concert; rather, the ESA works on those places and organizations that it can touch by virtue of their being in a political-bureaucratic-dollar relationship with a federal permitting agency. Restoration ecologists would prefer to work in coordinated fashion across the great North American flyways of the whooping crane, but not all parts of those ecosystems come under ESA's thumb. Therefore, USFWS cannot hold any particular recovery program responsible for the recovery of the listed species. This means that

science will be employed to do two things simultaneously that do not necessarily work smoothly together:

1. The objective of the recovery program will be to use the best available science to produce the best possible habitats for the listed species without regard to particular population fluctuations. Habitat systems will be restored. The best possible "species hotels" will be constructed whether or not occupancy rates rise or fall in any given time period. The adequacy of the recovery program will be evaluated according to its success or failure to produce these best possible habitats as a limited science can help define them. This requires program compliance science and monitoring, and has to do with meeting milestones by acquiring and protecting land, acquiring and delivering water, and by undertaking efforts to monitor and do scientifically grounded evaluation.

2. The USFWS, working independently of particular Platte river recovery program results in any given time period, cares intensely about particular population dynamics of the listed species. It is critically important to the agency whether or not whooping cranes (or other listed species) appear to be gaining or losing numbers. The agency, therefore, has an internal objective to monitor and evaluate biological responses of particular species at particular sites under particular conditions.

How can these two different science and monitoring concerns be reconciled? Answer: adaptive management!

Adaptive Management

In the past 30 years, adaptive management strategies for restoring and sustaining ecosystems have become popular because they provide a path for dealing with scientific uncertainty. There have been a growing number of applications of the concept especially in riparian and coastal marine ecosystem management (Walters 1997). Adaptive management strategies have become the centerpiece of policy initiatives in the Colorado River Basin (Collier, Webb, and Andrews 1997) and the Columbia River Basin (Lee 1993). Under the label of Adaptive Environmental Assessment and Management (AEAM) process (Holling 1978), (Walters 1986) the concepts are also being used to restore areas in the Upper Mississippi River Basin, the Florida Everglades (Walters, Gunderson, and Holling 1992), (Ogden and Davis 1994), and the Great Barrier Reef in Australia (Mapstone, Campbell, and Smith 1996).

Adaptive management strategies have been variously defined. "Adaptive management is an innovative technique that uses scientific information to help formulate management strategies in order to 'learn' from programs so that subsequent improvements can be made in formulating both successful policy and improved management programs" (Halbert 1993, p. 261-2). Lee and Lawrence define adaptive management as "a policy framework that recognizes biological uncertainty, while accepting the congressional mandate to proceed on the basis of the 'best available scientific knowledge'. An adaptive management policy treats the program as a set of experiments designed to test and extend the scientific basis of fish and wildlife management" (Lee

and Lawrence 1986). Finally, Bormann defines adaptive management as "... 'learning to manage by managing to learn'" (Bormann, Cunningham, Brookes, Manning, and Collopy 1993, p. 1).

Adaptive management, as adopted by participants in the Platte River Recovery Program, is about employing a program funded Integrated Management Research Program (IMRP) to test assumptions and predictions built into program manipulations of riverine and terrestrial habitat and then incorporate this information to improve program efforts. Peer reviewed science is used to construct conceptual models, guide formulation of restoration options, to monitor and evaluate outcomes, and ultimately to guide improved understanding of what the problems are (Luecke 2000).

What can adaptive management change under the terms of the 1997 Cooperative Agreement? Anything, in principle, can be open to re-negotiation and change with the approval of the Governance Committee and endorsement of the FWS. Given such open-ended possibilities, the states have pressed for clarification and assurance that they will not be confronted soon with peer reviewed science that calls for significant increases in terrestrial habitat (above 29,000 acres) or greater water contributions. The USFWS has given assurance that, during the first 13 year program increment, it would refrain pushing such proposals in the Governance Committee.

Adaptive management means, fundamentally, willingness of the several state and federal partners to play respectfully together on the "Platte basin field." It will be a game with no end in sight, no agreed scoring system, and much room for disagreement about how points are to be scored. Play-making discourse can be expected to be as wide ranging as a diverse constituency can make it; water users, state authorities, federal agencies, academic researchers, environmentalists will all enter the arena and pound out points of view and courses of action under the scrutiny of friendly critique and hostile opposition. There will be nothing neat and tidy about the process. But, in the final analysis, good science will mean "civic science" the kind of science that stands up to the best tests that friend and foe can bring to bear, the kind of science that understands the best hypotheses of today will be up for re-thinking tomorrow, the kind of science that understands retreat to re-think in the face of compelling evidence, better methods, and improved theoretical insight.

Adaptive management, rooted in the best of civic science, is a scary proposition for those political leaders and administrators who want to know in advance exactly what to expect, what financial commitments need to be made in order to produce pre-determined results and predictably obtain permits for their agencies and enterprises. It is frightening to politicians who want to keep control of the agenda and who know the danger of an unwanted finding dividing a winning coalition. Who, in either the public or private sector, wishes to repeatedly go to their superiors requesting more money to address unforeseen issues?

Environmentalists worry that adaptive management will be used by state water users to tie up otherwise viable action proposals in endless peer review. What happens when program projects do not achieve their projected results? How long will the water users and the states be allowed to do their analyses and re-analyses–1 year, 10 years, 25 years? The states and water users worry that adaptive management is little more than a code word for tapping into their treasuries for half-baked environmental schemes put together by "loopy biologists" who do not understand how

rivers work physically, socially, or politically. Adaptive management–and this may be the most frightening thing–means continual river basin level planning and concerted action by feuding water users and environmentalists, three bickering states and at least three federal agencies (FWS, USBR, FS) infamous for their inability to coordinate with each other or the states. A new river basin arena of public policy discourse is slowly haltingly, grudgingly being birthed and it has not been particularly comfortable for anyone.

Terms and Conditions

The Technical Committee became a forum for addressing crucial issues. Much work has been accomplished on matters such as writing monitoring protocols for the listed species and proposing budget for IMRP activities over the first program increment. But the big question has always been: If the states and DOI are to play cooperatively in Platte basin ecosystems about which all too little is known, what will the terms and conditions of that game be? Most especially, how flexible will the program referee--FWS-- be in dealing with state perspectives? Alternatively, what status does state and water user critique have?

On the one hand, the USFWS cannot simply yield to state definitions of what constitutes best habitat, what water flow regimes are "good enough." To do so would be to abandon its mandate to be the effective steward of the ESA and would invite a blizzard of lawsuits from environmental groups seeking to insure that the FWS preserves the integrity of the ESA. On the other hand, states have to get a "buy-in" in the process. Their voices must be heard and their messages given judicious consideration. Only water user communities within the states can actually implement the changed water regime. They must not be driven away by uncompromisingly rigid insistence about unobtainable "standards."

Technical committee sessions, by early 2000, had become highly contentious as between representatives of the USFWS and states. December, 2000, was coming fast and federal agencies wanted a signed agreement before the Clinton administration was to leave office. States saw FWS spokespeople as rigidly dictating criteria for program success in an attempt to check off boxes on their milestones lists. Federal voices were viewed as unwilling to enter into meaningful discourse. States that, themselves, were deeply divided over what constituted "new" water and other water issues came together in unified opposition to what they saw as unilateral federal demands In the eyes of the three state delegations, the federals were acting as though there would never be any future possibility of trouble about facts and their interpretation, that there could only be one interpretation of things such as baseline conditions, acceptable habitat, on- and off-channel mitigation priorities, about channel widths, best management practices, and flow regimes. States wanted to see federal flexibility written into the language of monitoring protocols. Federal authorities, for their part, did not want to create language that would permit states to dither and dismiss essential actions.

How much could the FWS give away in flexible language to obtain state "buy-ins"? How much could states afford to resist federal definitions of program success when, after the first 13 year program increment if not sooner, it will be the FWS that declares whether or not the program is sufficient to provide states with regulatory certainty. Failure to accommodate FWS needs would simply place a too compliant FWS in a position where it would be sued by

environmentalists. That would bring into the discourse outside lawyers and other environmentalists not party to years of delicate negotiations. A few court rulings that make sense in terms of legal precedent but make no sense for the players in the recovery program could quickly turn the process into mal-adaptive management. Each side required the other. For the states, the problem is that one side only–the Federal–has a player who controls the referee's whistle. Fundamentally, when all is said and done, if the states should somehow "win" in the early going, it will gain them little. The states will have to play on the same field with the federal DOI authorities and accept the federal verdict.

As months of 2000 went by, and as it became clear that there would not be an agreement to be signed by the end of the year, the discussion in the technical committee showed signs of working better. The Regional Director's office reined in some of the more relentless biologists and the FWS showed greater willingness to be more collaborative. Each state wished to avoid having the "dead body of a failed program" found at its doorstep. If any one state delegation raised objections too strongly to some aspect of water or land or research and monitoring program, it would create an opportunity for another state(s) to jump on the issue, use it as pretext for abandoning the program, and then point the finger at the vociferous one. Each party pushed but not too hard; it was important to control confrontations and keep the game going.

Conversation on the technical committee became less rancorous. Important work got done. At any given meeting 12-16 people–agency biologists, administrators, state water users, lawyers, environmentalists–defined data needs, methodological procedures so that data gathered would stand independently of any one or two observers. Research designs were outlined that would permit reliable and valid data sets that would facilitate comparisons from place to place, time to time, survey to survey, analysis to analysis. Nobody knew where it would all lead, nobody new the answers to the big questions, but the troubled discourse had produced people of diverse backgrounds and interests who were moving to do the best possible job of research and monitoring on behalf of the program. Nobody knew how punitive a future FWS could become; nobody knew how adept the states might become at playing a stalling game; nobody knew how environmentalists might push action insensitive to needs of other players–especially water users--in the coalition. They simply moved ahead with a game that was better than any imaginable alternative while hoping that the FWS referee would be a reasonable one. If the game were to get too far out of hand, environmentalists could go to the courts and water users have recourse to their congressional delegations.

CHAPTER SIXTEEN:
SCIENCE AS JUSTIFICATION FOR SACRIFICE:
THE 'JUNK SCIENCE' CONTROVERSY

In science, "truth" is procedural. "Truth" is dependent upon the logical procedures used to arrive at it. A "fact" is judged according to the quality of procedures that produced it. The person who has but one watch knows what time it is, but a group with multiple watches may never exactly be certain. But there are better and worse watches and better and worse methods for employing them, and better and worse logics by which to draw conclusions from the readings. Open reasoned discussion of use and maintenance of watches will tend to insure that the potential abuses of time keeping are minimized. People in a time sensitive contest where the stakes are high will want to be sure to organize the keeping of time in a manner that is open to inspection by all, and will attempt to insure that all parties can have confidence that the readings of the watch in a manner not biased in a manner favoring one contestant over another. "Junk" time-keeping (and science) is, therefore, self interested and advances the agendas of one player over another in ways not openly disclosed. "Good" time-keeping (science) is that which is open to continuous civic inspection and responds to reasoned critique with carefully argued logical justifications for practices.

The ESA is fundamentally science driven. It is science in some form that establishes the listing of species; it is science that justifies the selection of critical habitats, it is science that must grapple with the perplexing issues surrounding defining "recovery;" it is science that is to somehow to be an important guide to adaptive management in implementing habitat recovery options. The FWS must be in a position to say that the best science available underpins the logic of recovery program actions. Whatever sacrifices are entailed in implementing the recovery program must importantly justified by science. If science is seriously questionable, the entire edifice of recovery program justification loses its legitimacy. Calls for action on behalf of the recovery program become just so much "noise" in the ear of the skeptical listener. "Good science" justifies sacrifice. Program opponents waved the flag of alleged "junk science" to attempt to discredit those who would advance the recovery program and its objectives.

Allegations that the FWS has employed "junk science" to justify action on behalf of endangered and threatened species have been widely circulated. Two examples, especially, received wide hearings among opponents of Platte River Recovery Program negotiations. The first was a story about federal "junk science" centering on a so-called "lynx hoax." The second involved a series of confrontations over FWS/USBR actions in the Klamath river valley of southern Oregon and northern California.

Lynx Hoax

On January 24, 2002, the *Wall Street Journal* ran a front page story reporting a scandal over a high profile Canada Lynx survey conducted by the state of Washington in cooperation with the FWS in the preceding months. This followed a similar story produced by the *Washington Times* the preceding December 17. Seven employees of the FWS and Forest Service were alleged to have submitted hair samples from captive lynx--a threatened species--and had tried to pass them off as wild in order to establish lynx use of certain national forest areas and thereby

eventually block these areas to human use such as logging, ranching, and mining. This story flashed though the countryside and was particularly welcomed into the arsenal of stories offered in the camps of the ESA irreconcilables. To this vocal minority, at least, such an episode showed the FWS for what it was–an agency "out of control" that had been willing to use "junk science" to expand its power to elevate the needs of wildlife over the needs of economically hard pressed working folks. The media implicated field biologists the U.S. Forest Service, the U.S. Fish and Wildlife Service, and the Washington state Department of Fish and Wildlife. The story became a rallying point for property rights activists and their representatives at the State and Federal level, calling for investigations into unethical practices by scientists, disciplinary actions, and, most importantly, a complete revision of the Endangered Species Act (Williams 2002).

A more careful examination of the events revealed that nothing of the sort had actually occurred (Williams 2002). There had been no unethical activity. Rather, scientists had submitted blind samples of a variety of furs to laboratories because of concerns about the accuracy of analyses from previous data collection seasons. It has been common practice to check validity of laboratory analyses, to correctly distinguish and identify field samples. However, an informant within the Forest Service "leaked" information about the submission of blind samples to the lab as if the practice were suspect and newsworthy. Media repeatedly ignored the realities of the case, including the fact that no illegal or unethical activity had occurred, no data had been falsified, and there had been no confessions or refusals to cooperate with investigations. Internal and externally-contracted investigations resulted in clearing the alleged perpetrators of wrong-doing. However, the corrections to the story never received the widespread dissemination, especially among water users, that the original allegations had enjoyed. Harm had been done to the scientific reputations of the FWS, the Forest Service, and the state of Washington Fish and Wildlife Department.

Calamity on the Klamath

Based upon a FWS Biological Opinion which assessed the needs of endangered suckers and threatened Coho salmon, the USBR–in April, 2001–shut off irrigation water to about 90% of the 220,000 acres watered by the Klamath Project in Southern Oregon where the fields had been irrigated since 1907. A coalition of downstream commercial fishing and environmental groups had sued the USBR to force the shutting down of supplies to agriculture and to by-pass flows into the Klamath River for salmon and other fish (Clarren 2001). Farmers rebelled, and the long-ignored Klamath river basin became a flashpoint in the 28 year history of the ESA and its implementation. By July, farmers had crystallized a local social movement and hundreds of them, along with their supporters, used torches and crowbars to open headgates of an irrigation canal four times in a month while clearly sympathetic local law enforcement passively stood by. The ESA was directly and violently being attacked. Officers from the FWS and BLM would eventually stand inside locked gates guarding water valves against hostile locals. It was a bitter scene and testimony to what can go wrong in administration of the ESA.

Secretary of Interior, Gale Norton, would later announce that the farmers would receive about 15% of their usual annual water allotment in late summer, but this light and late sprinkling would not extinguish the eruption of rancorous conflict. By August, the Bush administration had asked the National Academy of Sciences (NAS) to review the FWS Biological Opinions that had justified the cutting off of irrigation flows. On February 5, 2002 the NAS issued an interim

report which stated that available scientific evidence did not support the need to require higher water levels in Oregon's Upper Klamath Lake or on Klamath River as proposed by federal agencies to protect endangered or threatened species of fish. This news was received by water users around the west as confirmation that FWS science was agenda based, self-interested, and could not be trusted to stand up to independent review.

Negotiating Away Science as an Issue

For years at least some representatives of each of the three states had asserted that USFWS "science" was "flat-out bogus." The charge was most pointed in the matter of target flows. To them the science under-girding the FWS definition of target flows for critical habitat (417,000 acre feet/year) could not stand to reasoned inspection. They had also openly confronted FWS authorities about what they claimed to be grossly inadequate agency use of science to justify its preferred form of habitat complexes as distinguished from alternative definitions of adequacy (channel habitat vs. sand pits–a topic that will be addressed in the following chapter). They had questioned much of the science that informed the "Biological Opinion" that, in turn, had provided the foundation of the federal case that basin water uses had imposed "jeopardy" on the listed species.

Yet, state delegations had been divided about how to handle the issue of so-called "bad" federal science. Some voices from the very beginning had advocated a confrontational approach–question the science, do not cooperate in building a recovery program. For the most part, such stridently negative voices were weeded out or tempered as it became clear that there would be a Cooperative Agreement launched on July 1, 1997. Those who remained at the table could see that if they become too negative about what they regarded as serious deficiencies of federal science, the negotiations would never proceed. If negotiations were to be halted, they would immediately fall into the grip individual Section 7 consultations. Compromise seemed possible and highly desirable. The FWS had backed off its insistence on 417,000 acre foot/year target flow number, it had divided its demand for 29,000 acres of habitat and requested only 10,000 acres to be in place by the end of the first program increment. For the pragmatists left at the table, the issue was resolved not by obtaining definitive science, but by working to deliver something of what the FWS wanted, avoid the "nightmare" of individual Section 7 consultations, and get regulatory certainty for their operations. A political compromise had substituted for the debate about what was quality science.

Unreconciled opponents of the recovery program negotiations sought ammunition. They had always argued against the ESA and used whatever antidote was handy at the moment to blemish federal agency actions in general and the USFWS in particular.

Federal Science and Mr. Osborne's Hearings

Meanwhile, while the crisis on the Klamath was unfolding and stories of the 'lynx hoax" were circulating, political elites were coming under pressure in Nebraska from constituents unhappy with prospects of a endangered species recovery program. Among them was freshman congressman Tom Osborne (Republican-Nebraska), more than well aware that voters in his district were watching the events on the Klamath. He further knew that Nebraska farmers

upstream of Lake McConaughy were contracted to the USBR in ways very similar to the contracts on the Klamath.

As political pressure mounted, he would have to publically lead one way or another. Toward this end, he arranged to conduct a Congressional Field Hearing that was held on Saturday, February 16, 2002, in Grand Island. The hearing was held in the largest auditorium available on the College Park campus adjacent to Husker Highway. The room was packed with a variety of intensely interested citizens, over 300 of them, and notable in the crowd wearing red jackets and caps were several dozen "Nebraska First" lobbying group members who had sent out flyers to mobilize groundwater users with a leaflet. Under the banner, "Protecting Nebraska's Groundwater for Agriculture," was the language: "Once again, the USFWS has been exposed as being a rogue, out of control, and a dishonest federal agency." The text cited the conflict on the Klamath and the "lynx hoax." It alleged that the FWS had not used sound science to support its decisions that impose harm on people. Citizens were called to put an end to unspecified FWS abuses in Nebraska. Nebraska elected officials were requested to order FWS to "close all species and habitat activities in our state" until an "independent scientific analysis" could be undertaken. "We are not asleep at the switch!"

Representative Osborne opened the session by noting that no disturbance of any kind would be tolerated, a reference to threats of violence that had already occurred at Nebraska land committee sessions. He then went on to lament the calamity that had occurred during the preceding summer in the Klamath River Basin. USFWS and USBR activities there had hurt people without helping target species. It was a time, he said, to be proactive in Nebraska.

The Nebraska Platte River Recovery Program negotiating team, several Nebraska state agricultural leaders who had not directly participated in the negotiations, a representative of Nebraska's Audubon Society, and the Lakewood, Colorado FWS Regional Director's Office were in the dock. One by one they made their respective cases for the recovery program. Osborne's tactic was to hear their brief presentations and to question them. He began by saying, "They have some explaining to do!" Testimony stressed repeatedly that the program would not take water from any irrigator except on a "willing lessee/lessor" basis. Two presenters, one from the state Department of Agriculture and another representing the Central NRD expressed concern that economic growth might suffer and that FWS science was not to be fully trusted. Members of the Nebraska recovery program negotiating team and the FWS provided overviews of the proposed program and explained why it was needed.

Sitting in the audience, one got the sense that most citizens were hearing for the very first time what the program would entail. They heard summaries of the major considerations that had driven the need for it, that it would not place heavy burdens on anybody, that there were benefits to be had. Almost five years after the Cooperative Agreement was signed, most were learning for the first time about what had brought their Nebraska leaders to the negotiating table, and that there were compelling reasons for what they had been doing.

In his summation, Representative Osborne stressed that the ESA needed reform. It protected species, he said, without any regard for economic impact and that was a problem. But, he noted, there were many people in urban areas of the country, especially on each coast, who

liked the ESA just the way it has been; politically, we cannot easily change it. But everybody agreed that decisions must be based on the best peer reviewed science. He allowed that the Cooperative Agreement was good in principle; it offered a political solution to an important problem. The negotiations on behalf of the proposed recovery program had raised issues with Nebraska's water law and planning. Nebraska has had an excellent water situation over-all and Nebraskans needed a state water plan to be proactive and to protect themselves.

Many people close to the recovery program negotiations worried about the effect that the Osborne hearing would have. There was a concern that groundwater users might somehow hi-jack the sessions and the turmoil would place the Nebraska authorities in even greater political difficulty. The disciplined conduct of the session prevented that scenario, and did succeed in getting reasoned arguments out to community leaders from around the state. However, there was to be a repercussion that would raise deeply problematic issues. Mr. Osborne would write a letter.

Bringing Back Science as an Issue

Congressman Osborne sent a letter to Secretary Norton (DOI) dated February 26, 2002, noting that his constituents were concerned that the FWS was planning to designate critical habitat for the piping plover in riverine areas that the birds used much less than off-channel habitat around sandpits and lake shores. He went on to assert that FWS science was suspect and should be reviewed by the National Academy of Sciences or similar independent qualified scientific authority. The message was clear. The FWS could not be trusted to do good science. This point had been groused about around the negotiating table for years, but it had been subordinated to the political desire of state water users to just build a reasonable and prudent alternative and obtain regulatory certainty. A popular politician had now entered the fray and had picked up that old theme and elevated it to the highest levels of state and federal government.

One can surmise that, the Governor of Nebraska–facing a difficult choice as to whether or not to sign a completed recovery program agreement–would find important political cover in endorsing Congressman Osborne's call for a NAS review of the FWS's science. By mid-June, 2002, it became clear that Nebraska authorities were promoting a broad NAS review of the "proposed Platte River Recovery Implementation Program and the science on which it is based." There would be nothing held aside. Reviewers would be asked to examine the science related to establishing habitat requirements, how flow regimes have impacted target species and their habitats, whether or not the proposed habitat restoration activities were grounded in good science, whether the proposed monitoring and research activities were scientifically justifiable. They proposed a timeline that would have NAS funding available by October, work beginning by December, 2002, and a final report issued by September of 2004. Nebraska was leading the way to additional program delay.

Wyoming negotiators and Colorado representatives who had for years pounded out the program details with the federal authorities strongly disagreed with Nebraska's tactic and lamented even bringing up an option to conduct an NAS review. Over the years all parties had whittled the water and land components into a shape that each could live with. Who was to say that a NAS review of the science undergirding the program would not conclude that there was a need for more terrestrial habitat, or qualitatively different habitat than that which has been so far

be negotiated. What if the NAS were to conclude that more, not less, water was to be required? Everything that had been so laboriously assembled could come crashing down under the weight of outside review and the fallen program would not serve anybody's interest–federal, state, local. Furthermore, even if a NAS review undermined the over-all justification for the basin-wide program and caused it to be abandoned, the ESA would not go away, the need for Section 7 consultations would not evaporate. All a NAS review could do was risk "blowing up" a carefully negotiated recovery program and place water users in the nightmare of individual permitting processes too horrible to seriously contemplate. Nebraska had taken a tack that was insanely dangerous. As one long-time state negotiator said, "...if the Osborne strategy blows up the recovery program, and we lose our chance at regulatory certainty, we will be all over him like stink on cow manure."

Yet, could any governor resist endorsing an independent review of the science now that the issue had been so boldly placed on the table? The draft NAS rejection of FWS/BOR science on the Klamath was reverberating. Many citizens, especially in Nebraska, attentive to water issues and reading the newspapers began to flirt with the idea that something was wrong with federal science, at least in the eyes of some. Beyond the small circle of program negotiators, virtually nobody had a fine toothed understanding of the proposed recovery program and its alternatives. Even state legislators who had watched negotiations were confused by years of detailed proceedings. Did any Governor dare in this context to simply say that federal science was good enough and there was no need for independent review? Would an opportunistic political opponent see an opportunity for doing damage here? Why was an independent review not a good thing? Why was our governor not endorsing it? Negotiators may have successfully pushed the issue of federal science off the table years ago, and may have had no desire to bring it back, but the issue of questionable federal science requiring review was gaining life in the political hands of the three state governors–Mike Johanns in Nebraska, Wyoming's Jim Geringer, and Bill Owens of Colorado.

In Wyoming, Governor Jim Geringer appeared to be moving with some reluctance to venture qualified support of a NAS review. How do you ask your people to sacrifice if the science that justifies the program is no good? In Colorado, the Owens administration eagerly grasped the opportunity that the issue provided. Former Colorado Governor Roy Romer had been Chairman of the Democratic National Committee, and had close ties with the Clinton administration, and actively supported Bruce Babbit's concept of a collaborative river basin program. But Romer's successor in office, Republican Bill Owens, assembled an administration deeply skeptical of any state-federal collaborative program. Communications between the policy-making levels of the Owens administration and local water users in the mutual companies and districts along Colorado's South Platte river were all too sparse, sporadic, and troubled. What the Colorado water workers of the Platte River Project and SPLRG had put together over years of effort in the negotiations, and at Tamarack, was not warmly embraced by the political appointees of the Owens administration. The idea of requesting a NAS review served their purposes very well. As one Owens' appointee put it in a conversation with Colorado supporters of the Tamarack Plan:

"The politics of this is that you guys (Colorado South Platte water users) don't want NAS to take an independent look at the science on which the whole program is based. You want to promote and defend your negotiated solution...How do you go to a Governor during the biggest

drought in a hundred years, and ask him to sign on this program without a NAS review that the Governors of Nebraska and Wyoming are calling for? Governor Owens is not prepared to sign on the recovery program without a NAS review."

In Colorado, local people working within their local constraints and opportunities had worked for years to put together their contribution to the basin-wide recovery program, but faced rejection by their state Republican administration that chose to place its anti-ESA ideology above the product of local Colorado water user effort. In Nebraska, the opposite scenario was playing out. State negotiators had built a Nebraska program that aroused sufficient opposition from among local groundwater users such that the Governor was feeling intense pressure not to back his own representatives.

So it had come to pass that, by mid-summer, 2002, the issue of the integrity of federal science, deftly put away in time to build the 1997 Cooperative Agreement, had once more emerged as a hovering specter. Colorado's higher administration chose to hold hands with an enthusiastic Nebraska governor's office and a more reluctant Wyoming. The negotiating teams in each of the three states saw the dangers of the choice. Wyoming and Colorado water user representatives in the negotiations were adamantly opposed to the concept of the NAS review. Nebraska's team was split. In the waning days of 2000, for reasons to be discussed in the next chapter, the Cooperative agreement had already been extended until June 30, 2003. But time had passed quickly, and with the latest deadline little more than a year away, Governors' calling for a NAS review of federal science was a massive headache for negotiators. The thought of another delay in program signing–at least another 18-24 months–was unwelcome, but even more worrisome was the threat that an unknown review team–competent to be sure, but insensitive to the myriad considerations that had gone into the proposed program–would carve up the world in new ways, undo years of handiwork wrought by the most thoughtful people the several parties could muster, and leave everybody facing a world nightmarish independent Section 7 consultations.

The decision to undertake the NAS review, pushed by political forces in the states only loosely linked to the negotiating room, marked a stunning shift in entire negotiating process. Whereas the parties had once agreed to disagree on matters of federal science, and had found a way to move forward based on a political willingness to provide specific benefits to species habitat via adaptive management, now the states had chosen a path to a "deal" that could not be a "deal" until it had been validated by a federally organized team of scientists. This constituted a state imposed fundamental "about face" in the march toward assembling a viable habitat recovery program. What had been, for some at least, a search for political cover, had become a strategic shift of direction, the consequences of which are unknown at this writing. The NAS team has been assembled, it has conducted field hearings, and it is expected to produce a draft report in January, 2004. The final report is scheduled for release June 30, 2004. It was the justifications of science–however incomplete and to whatever extent containing error–that had brought negotiators to the table; now a new NAS twist in the justifications of science could potentially unravel everything.

CHAPTER SEVENTEEN:
SCIENCE AS FAITH: NEGOTIATING AN ADAPTIVE MANAGEMENT FRAMEWORK FOR TERRESTRIAL HABITAT

Program negotiations have been driven throughout by the challenge posed by ESA Section 7 jeopardy findings. However, a related–and most controversial--aspect of the ESA has been designation of critical habitat–the geographic area requiring special management on behalf of the target species. Designations have been the target of environmentalists who argue that the FWS has been too slow and too conservative in identifying and designating it. Commodity producers have roundly condemned the FWS for designating critical habitats too fast, too much, and too carelessly. On the Platte, the original story of the designations (for the whooping crane and piping plover) will remain untold here. There has been no critical habitat designated for the least tern or pallid sturgeon. For the whooping crane, designated habitat begins at the upstream end at the junction of U.S. highway 283 and I-80 near Lexington, Nebraska, and extends eastward along the river and downstream to a point near the community of Shelton. Piping plover habitat extends down river to its mouth.

The June, 1997, Cooperative Agreement established a Land Committee to address that vexed family of issues pertaining to evaluating, acquiring, crediting, managing, restoring, and monitoring land habitat for the three listed birds within the larger critical habitat. It was one thing for the FWS to designate critical habitat as part of the negotiations between FERC, FWS, and the two districts operating at Kingsley Dam. It was quite another thing to contemplate the myriad issues associated with acquiring 10,000 acres of suitable land in the first 10-13 year program increment, and do so in a manner that would make possible construction of a reasonable and prudent alternative.

Establishing a Forum for Discourse–Tumultuous Times on the Land Committee

Following the signing of the July, 1997 Cooperative Agreement early on only a small group of those who had been closely associated with the negotiations attended land committee meetings. However, that period of quiet was not to last. Sessions soon became deeply troubled. The signing of the Cooperative Agreement had not been well received by many irrigators in Nebraska, most especially those groundwater users who elected to join Nebraska First. By late 1997, and throughout 1998, meetings were targeted by protestors who chose to vent their anguish at the program forum most conveniently available to them, the Land Committee which met in various Nebraska towns.

In the case of water, a limited constituency of easily identifiable water suppliers in the three states could easily determine appropriate membership for a water management committee. Land, however, posed a different organizational problem. Within the designated critical habitat land is an asset distributed across thousands of ownerships in only one of the states–Nebraska. Thoughts of joint state-federal land ownership–and all the regulations and bureaucracy that rides with managing it–were not welcome in many Nebraska quarters. Furthermore, most landowners operating wells for pumping groundwater were not only being drawn into an unwanted discussion of their impacts on river flows, many felt threatened by a proposed federal program for land management about which they knew little. Representatives of their local organizations–Natural

Resource Districts–did not participate actively in program negotiations and were not, for the most part, effective conduits for full flow of program information to local citizens.

Unlike Colorado, where the Tamarack plan had been pieced together by the water users themselves who came out of irrigation districts, mutual ditch companies, Denver Water, and Northern Colorado Water Conservancy District, the water action plan in Nebraska had been primarily led by state level authorities and representatives of two Districts (CNPPID/NPPD) who needed to re-license their facilities up-river in the western part of the state. Groundwater users were out of the loop also because they wanted to be out. But the price of disassociation was lack of understanding about what had been negotiated.

Furthermore, there could be no clear blueprint of a land plan to be placed on the table for public inspection and rational discourse. The small number of Nebraska negotiators had knowledge of program principles that would apply to land acquisition and management–criteria that had been forged in the talks leading up to the 1997 agreement–but there was no organized informational pipeline to Nebraska landowners that could adequately convey the messages regarding the proposed recovery program and how it would acquire and manage land. Besides, much of any blueprint for land had yet to be worked out.

In this context a large population of nervous agriculturalists fed on slim rations of program knowledge and large helpings of fear-laden rumor. A small fraction, mobilized by a few leaders under the banner of Nebraska First who had been ideologically opposed to many federal government programs in many policy domains, were outright hostile to the very thought of re-regulating Platte river water for endangered or threatened species. Furthermore, to them the idea was repugnant that outsiders from Wyoming, Colorado, and the Department of Interior would somehow "move in" on Nebraska land and put it to purposes that they averred Nebraskans did not want.

The new but still largely unformed Land Committee was not going to deal with habitat in Colorado, not in Wyoming, not in Washington, D.C. It was going to focus on an agenda addressing issues of land acquisition and management in central Nebraska's designated critical habitat, a place where many locals were more than a little worried about what was going to happen to them. Specifically, many Nebraska groundwater users deeply resented the proposed basin-wide recovery program because it was forcing two discussions on them that they had fought against for years: a) Nebraska internal issues as between well owners and senior surface water right holders; and b) the federal endangered species agenda that had started up with the re-licensing of CNPPID and NPPD facilities at Kingsley Dam, and by then had transformed itself into the multi-state cooperative search for relief from jeopardy. Before one could contemplate the problems of implementing a philosophy of adaptive management, informed by the best available science, recovery program leaders would have to confront the fundamental problem of simply initiating an orderly land committee process. It would prove to be a challenge.

One problem was simply to determine committee membership. Representatives from Colorado and Wyoming absolutely needed to serve as did representatives from the environmental community. Among other things, Colorado and Wyoming representatives to the committee had fiscal responsibilities to see that their taxpayer dollar contributions to the land budget would be

well spent and that proper accountability mechanisms would be established. However, it was politically touchy for Nebraska authorities to actively push their presence in the early going. The specter, however mis-drawn, of "outsiders" (i.e., Coloradoans, Wyomingites, federal Department of Interior employees, and environmentalists)–taking control of significant amounts of Nebraska land (i.e., the long term objective of 29,000 acres would represent about 7% of the area within the designated critical habitat) threatened to mobilize social forces that made Nebraska authorities shudder to contemplate.

By what principle would Nebraskans be selected for committee membership? Any membership selection criterion would antagonize important Nebraska constituencies. Given the clear conflict cleavages that divided groundwater and surface water users, it would be politically contentious for Nebraska state authorities to push any given criterion or representative. A public debate over principles or personalities would not serve program interests; it would simply galvanize backlash. Given a lack of obvious and easy options, nobody was eager to select anybody and time quickly passed.

At first, land committee meetings enjoyed some quiet; they were attended primarily by a small group of people who had been close to the negotiations. Soon, however, a land committee that needed to establish a viable and stable membership, create a charter, establish procedures for discussion, voting, select leadership, and develop habitat criteria, was besieged by protesters who arrived in the parking lots of meeting places by car, truck, and fully loaded buses. A land committee that needed to initiate careful thought about habitat criteria, procedures for land acquisition, and to devise options for organizing to a land management entity was, instead, became virtually paralyzed by the vehemence of repeated protest. Packed meeting rooms were stages for the venting of opposition by farmers who were clearly not interested in a smooth committee start-up. At times, moderate voices went largely unheard by the more radicalized. More thoughtful voices, attempting to articulate fundamental program ideas were repeatedly shouted down. Attempts to explain program principles drew wrath (e.g., that all program land would be acquired on a willing-seller-buyer basis–i.e., no condemnations--and that designation of critical habitat would not affect private ownership rights within the boundaries, that government agents would not have access to private lands, that the program would not deny access to private property). There were, of course, moments of productive discourse, but, for the most part, in the meetings of 1998, moderate voices of reason struggled to construct an orderly committee business process. Before the Land Committee could credibly advise the Governance Committee on matters pertaining to acquisition and management of terrestrial habitat, it would have to become a committee that would be much more than whoever showed up.

Sessions of summer and early fall, 1998, were especially troubling. At the Ramada Inn in Kearney, at the Central Platte Natural Resource District Building in Grand Island, and in Lexington, people packed themselves in overflowing rooms. Those who could not squeeze in the doorways milled in parking lots. Thoughtful observers and participants sensed that the process was on the edge of erupting into overt violence. Some Nebraska First people, especially, placed their hostility on display. It was an intimidating atmosphere for those who came to do work–especially representatives from Colorado and Wyoming–and who rose from time to time to at least attempt to speak on behalf of the need for orderly discussion, who wanted to share information, or make a case for the program. They were, on several occasions, shouted down by

people convinced that the federal program would dispossess them of their land, and there were even a few who saw connections between the proposed program and black helicopters spotted in the countryside supposedly carrying agents hostile to the "American way."

Something had to be done before things spiraled out of control. Social interaction in and around the Land Committee had become highly polarized; negotiability of issues was severely threatened. Ways and means would have to be found to de-polarize, to find cross-cutting attachments that would make for more common ground. Any adequate attempt to relate the story of this episode would require knowledge, history, and space well beyond that which can be provided here. However, beginning in the late summer and fall months of 1998 and though 1999, the Land Committee atmosphere became much improved.

A public information table was set up and made available at all meetings. After discussions with Nebraska First leaders, it was agreed that there would be no more busloads of people rounded up and delivered by that organization; rather Nebraska First would send a small number of representatives to observe committee proceedings and, along with others, be permitted to speak during specified times. Given the committee leadership vacuum, the radicalized leader of Nebraska First had moved to fill the void with two personally selected farmer associates to serve a co-chairs. However, these plans soon went awry. Rather than be the program wrecking crew they were selected to be, "his boys" proved to possess minds of their own. Each representative set about the business of learning more about the program, explored the implications and the options, and exerted their autonomy in many ways including defying at least one public threat to life and limb from the frustrated leader of Nebraska First.

Information began to flow. The Land Committee was, inadvertently, becoming the most effective channel available to Nebraska authorities for outreach and education. As difficult as many committee sessions had been, people who had come to protest against a program that they had understood would threaten their livelihoods and their freedoms, learned essential program facts. While some in the audiences continued to reject the message of speakers on behalf of the proposed program, others were getting a message that maybe this program was not the threat they had been led to envisage. The crowds may have been too large for the rooms, some continued to be vociferous in their opposition, but many heard the program side of the story for the first time, concluded that the threat was not so serious, and simply returned to their farms, ranches, and places of business. The radicals had overplayed their hand in the minds of many. Radicals thinned as their support waned. Moments of rancorous conflict diminished and periods of authentic exchange of information increased. Program leaders and Nebraskans had found ways to de-polarize and establish social grounds for conducting discourse about land habitat.

By November, 1998, the Land Committee was moving rapidly toward being organized, with sub-committees and a clearly specified membership consisting of two from the federal government, one from each of the three states, Nebraska landowners, a hydropower representative, and an environmentalist–a profile that reflected the composition of other advisory committees. Sessions began to settle into a general pattern that people could live with. Monthly meetings of the full Land Committee would be held in fall, winter, and spring months with time-out during the busy summer growing season when farmers needed to be in their fields from before dawn to after dusk. Sessions still drew those who persisted in venting their opposition, but they

were speaking out during times set on an agenda that made space for comments from the floor. Meanwhile, off the main stage, sub-committees began their substantive work.

There was much to do. Criteria needed to be formulated for assessing suitable habitat. Procedures would have to be constructed that would permit speedy and flexible acquisition of land, and strategies would have to evolve for entering local land markets without playing the part of city dude with too much money, too little sense, and vulnerable to be taken for a pricey ride by colluding locals. How could a program put together by three states and the Department of Interior function as a "good neighbor" capable of responding quickly and effectively to local problems (e.g.. weed control, fencing problems, wetland soaking of neighboring property)? Consideration would have to be given to the nature of the organizational entity that should be engaged to manage program lands. A system would have to be created for crediting each participant-donor to the land budget with a land equity stake so that assets could be justly distributed in the event the program would collapse. How could Wyoming and Colorado hold equity stakes in Nebraska? What methods should be used to acquire land?

All these issues, and more, required committee attention. Here, however, only one issue will be addressed–the problem of employing faith in science as informant to a continuous adaptive management process. How was suitable habitat to be defined? In a complex theory-defying world of dynamic ecosystems and shifting social-political coalitions, negotiators would be severely tested as they worked their way toward a way of envisioning how adaptive management employing the best available science could define the kind of habitat that the FWS could accept as adequate for a reasonable and prudent alternative, and with which the states could live.

What Constitutes Adequate Habitat?

A most strategic objective was to work out procedures, within an adaptive management philosophy, to acquire high quality habitat from willing sellers or leasers within the boundaries of the Lexington-Chapman designated critical habitat area. Then, program participants would take on the problems involved with devising means to protect those lands, and where needed, restore them so that, in interaction with the re-regulated river flows, would produce desired habitat characteristics.

What acreage would count against the 10,000 acre first increment goal in any FWS scoring system? Would only those parcels count that fulfilled "idealized" criteria to the greatest extent? If so, the availability of suitable land would be sharply diminished and prices would vastly escalate. If one was to compromise the highest standards in land selection, how much compromise would be acceptable to the FWS? In March, 2001, after lengthy–even at points bitter--discussion, the Governance Committee provisionally agreed on a policy statement that incorporated a principle of "flexibility" in the selection of habitat lands. The language of the statement made it clear that certain lands may count as "suitable habitat" even if their characteristics were found to be less than "ideal" and that program funds may be used, within limits, to acquire some "alternative habitats" for the purpose of determining over time whether or not they provide demonstrable benefits to the listed species. Alternative habitats were understood to consist of sand pits and non-riverine wetlands that would exist beyond the boundaries of FWS defined "habitat complexes."

A related issue lay at the center of the negotiations: given that adaptive management necessarily means changing policy on the basis of research, learning, and the drawing of logical conclusions from investigations, would "adequate" terrestrial habitat acquired in good faith by the states under one FWS administration be found somehow insufficient by later DOI administrative and scientific teams for reasons other than what sound science would justify? Would agency biologists, unelected by anyone and accountable only to civil service procedures murky to outsiders, move the habitat sufficiency goal posts only for good sound scientific reasons or would they be subject to arbitrary and capricious considerations driven less by logic and science and more by agency agendas of the moment? There can be no firm answers to such questions. There could only be faith in negotiating a deal that all could accept as they prepared themselves to hold hands in the hope that sound science and civil discourse in adaptive management would help them learn play a reasonable game of habitat acquisition and management.

In addition to the perplexing uncertainties faced by the negotiators in contemplating issues of habitat, the discussion labored under set of constraints unique to the problem of acquiring land–issues that the water negotiations did not have to confront. In the world of water, the asset is publically owned and water records had been well kept for over a century by all parties. Everybody knew roughly the pattern of basin flows and they knew exactly which parties managed specific flows in each stream segment. There was no constraint on publically sharing data about the availability of water among all parties. Nobody could hide a significant fraction of flow from anybody else. In the domain of land–a private good traded on markets–things were different.

The Politics of Data and Markets

The FWS has utilized land information produced by the United States Geological Survey (USGS) that, in turn, employed Geological Information Systems (GIS) technology to map the critical habitat. The FWS thereby has been able to identify with a high degree of precision and certainty what land parcels have the best habitat potential. The problem is, of course, that although GIS mapping products are a matter of public record, the FWS dared not release information regarding its priorities for acquisition. Furthermore, if the information was to be employed to make policy decisions prior to conclusion of the negotiations, it would likely be subject to dissemination under the open records law. One thing the state, federal, and environmental representatives could readily agree upon was that any "hypothetical" analysis of land parcels–to show how the 10,000 or 29,000 acre objective was best achievable would get beyond the negotiating room, be variously interpreted, alarm some landowners while delighting others, be the subject of attention by citizens worried about the potential negative impacts to their communities, and–most of all–initiate spasms of land speculation that could be to the disadvantage of all parties. Specifically, if such analysis ever got on the street, the program would never be able to afford those lands targeted as most desirable.

Therefore, the FWS could not show its maps to the Governance Committee or to technical committee members. Talk about GIS analysis of habitat was so potentially dangerous, it was best postponed until after a program would be put together, endorsed by the signatories, and the Governance Committee actually was prepared to initiate habitat acquisition. The FWS could only

put out a message to the effect that land with certain attributes was desired. The negotiators would not work with the level of specifics as they did in the domain of water.

On the one hand, participants in the proposed recovery program would need to put together concentrated and sizable habitat complexes as quickly as possible during the first program increment. Anything that could be done during the Cooperative Agreement period (at that time, mid-1997 to mid-2000) to create an inventory of actual and potential habitat and to begin locating the most desirable parcels would be a valued step ahead for any party wanting to construct a viable reasonable and prudent alternative. Yet, on the other hand, many state representatives resisted any federal ideas of moving ahead with putting together anything by way of specific potential plans for terrestrial habitat–hypothetical or not. They contended that the logic of market success in dealing with willing sellers is to scatter purchases and leases over time and across the area. If the program moves too fast in a concentrated area, it will create a colluding bloc of sellers who will extract higher prices that will threaten the limited program budget. Furthermore, suspicions can be expected to quickly rise to the effect that agriculture will be operating in more hostile local environments created by the environmental agenda. Locals can be expected to deeply divide themselves; locals who contemplate a sale to the program may well earn hostility from those who either cannot or will not sell. All of this risks creation of resistance to the program in communities.

Adaptive management, informed by the best available science, must proceed with sensitivity, patience, and care, all the while never fully revealing the larger pattern of desired habitat. Adaptive management in advancing this enterprise during the first program increment will require the education of scientists, faces of preachers, the hearts of gamblers, souls of realtors, and the patience of quilters who in this instance will be stitching river channels to wetlands and buffer zones with sand pits on the fringes.

Adapting Toward Sufficiency

If water users in the three states want to obtain regulatory certainty, they must collaboratively construct a basin-wide reasonable and prudent alternative to modifying or shutting down their water projects. Construction of a reasonable and prudent alternative will take decades. In the meantime, regulatory certainty will be obtained by fulfilling milestones. But, in the domain of terrestrial habitat, how will all the parties know when milestones have been met? On the one hand, it is critical that clear criteria be established that can be used as guides toward a fully sufficient recovery program; yet, on the other hand, formulations that are either too explicit and rigid or too vague will undercut viable adaptive management and hopes to employ sound science.

If water users in three states, environmentalists, and two agencies of DOI were to shake hands and agree to play an adaptive management game together for many years there had to be some agreement as to what the goal posts were going to look like and how points could be scored. Failure to work out principles for land acquisition would place the entire program in jeopardy. If adaptive management was to become a viable concept, it had to be made to work during negotiations themselves.

The Cooperative Agreement had set forth a vision that, in the first 10-13 year increment,

the program should expect to move as rapidly as possible toward establishment of three large habitat complexes each of which would be at least about 2500 acres in area–one upstream of Kearney, Nebraska, one near Kearney, and one downstream. Habitat complexes for the three birds were understood to incorporate sufficiently wide and braided channel areas, adjacent wet meadows, and buffer lands to protect the species from human disturbance. The first program increment was pledged to develop 10,000 acres of suitable habitat. After completion of the first increment, the program will continue to acquire suitable habitat up to a total of 29,000 acres.

The three proposed complexes would serve in addition to 2,650 acres of habitat, locally known as Cottonwood Ranch, already acquired by NPPD as part of its FERC re-licensing agreement. It was understood that, given restoration, the Cottonwood Ranch property would count toward the 10,000 acre goal. Together these ecosystem assemblies would provide over 10,000 acres of:

1. barren sand-island in the river channel for cranes, least terns and piping plovers; the FWS abandoned any idea of fostering permanent islands in the channel because to do so would simply train predators where to go for dinner. Therefore a continuously changing river channel is important.

2. roosting habitat on and around sandbars that would provide shallow water depths for cranes at sites where fields of vision would have a radius as long as 650 feet or, obviously, a diameter from bank to bank of twice that;

3. adjacent wet meadows where cranes can get their protein as they prepare for further migration and egg-laying; many of the food organisms eaten by migrating birds in general, and cranes in particular, are dependent upon the moist and saturated soils of wetlands for all or part of their life cycles.

4. buffer zones to protect the birds from human disturbance.

FWS authorities knew well that it could not expect the program to immediately obtain what the agency most prefers. It simply wanted to make every effort to approximate the model as much as possible in an imperfect world The closer the program could come to this ideal of large complete complexes, the stronger the case for evaluating the program as a sufficient reasonable and prudent alternative. This kind of language, most reasonable to the FWS, made the states nervous.

At its core, the struggle between FWS and state negotiators was simple. The FWS had prepared a biological opinion (U.S. Fish & Wildlife Service 1997a) that found listed species to be in jeopardy by virtue of human caused habitat destruction. Under the law, the FWS could not negotiate away the meaning and import of that, or any other, biological opinion. The FWS had little option but take a "hard line" to insure that its jeopardy standard would not be easily assailable in the courts from disgruntled environmentalists who would inevitably scrutinize the program agreement. The FWS had every incentive to operate with the idea that there was ample land that could fulfill rather rigidly constructed high standards for virtually all program acreage. Agency representatives, therefore, strove to reduce to a minimum the latitude of water users in

the states to define sufficient habitat in the adaptive management process. It would press for high habitat quality standards and for explicitly writing things down in detailed ways.

The states, in turn, energetically pushed back against what they considered an unjustifiable FWS "straightjacket." States pressed for maximum possible latitude in defining habitat. They had every incentive to construct a vision of scarcity of land that could fulfill high FWS standards, they argued for looser language that would permit maximum flexibility, and they resisted having too much detail written down.

As had been the case in the world of water re-regulation, the discussions revealed that the partners in adaptive management were not equals. Federal negotiators, given their agency mandate, could accept a collaborative process only to a point. They would entertain ideas only insofar as proposals would protect the meaning of the original Biological Opinion. If the partners in the program could not find sufficient habitat that could fulfill FWS standards, life is simple: water users could expect to lose their reasonable and prudent alternative and regulatory certainty.

In reply, several on the states' delegations after extended meetings that produced little by way of federal "flexibility," lamented the rigidity of federal biologists "frothing" with what state representatives saw as wrongheaded federal interpretations as to actual needs of the species, and unable to consider "reasonable" proposals by people who knew that the central Platte ecosystem offered a richer array of habitat possibilities than what FWS biologists were prepared to entertain. Several state representatives to the land and technical committees saw in all this, not so much a federal commitment to "sound science" in the guidance of future decision-making, but more than a little federal commitment to avoid future lawsuits from environmental organizations that could tie things up in courts for years.

Voices speaking for the FWS simply replied by using words that states so frequently conjured up: "a "deal is a deal"–state representatives should just read the Cooperative Agreement. From the federal point of view, the states were way "off-base" in their attacks on so-called FWS "rigidity." The Cooperative Agreement (July 1, 1997) clearly articulated the habitat goals of the projected first program increment. The Platte River Management Joint Study (1993–see Chapter 6) had envisioned the future program as acquiring and managing "large contiguous parcels of terrestrial and aquatic habitat" that would cumulate to 29,000 acres. Later, during negotiations leading to the Cooperative Agreement, DOI and the states would:

a. agree to incorporate the Joint Study vision of habitat complexes in the Cooperative Agreement of mid-1997;

b. compromise by committing to provide a total of 10,000 acres of viable habitat during the first 13 program years–a reduction from the larger target of 29,000 acres. This compromise was forged in the context of another agreement to reduce shortages to target flows from and average of 417,000 acre feet/year to something in the range of 130,000-150,000;

Given all this, DOI representatives believed that they had succeeded in obtaining a commitment from the states to the concept of acquiring large high quality habitat complexes as a *quid pro quo* for having compromised first increment habitat and water quantities. They were

dismayed in the extreme when representatives of the states, soon after the technical committee was established, began to try to re-negotiate what the feds had felt was a "deal" to go after the best contiguous habitat complexes possible. In federal eyes, state representatives were exhibiting bad faith to spend 5 years (1998-2002) pecking at, and trying to renegotiate, the habitat language in the Cooperative Agreement.

For their part, many representatives of the states began to advance the view that the difficult discussions about the definition of adequate habitat revealed the "collaborative process" as a fraud, an illusion. There was, they said, no authentic collaboration--just questionable dictates from the Grand Island Office of the FWS. The biggest issue centered on the question: should off-channel habitat used by the three birds, but disconnected from the large habitat complexes specified by the FWS, have a place in the program, and should that place be acknowledged right up front? The states argued that when it was demonstrable that birds were using such alternative habitats–i.e. sandpits and non-riverine wetlands–that the program should spend at least some of its budget on acquiring them and such habitat should be counted. The FWS would resist such a move.

Sandpits were artificially created along the Platte River corridor by various Nebraska construction projects in need of gravel. The major project that accounted for most sandpit digging was the building of Interstate 80 which roughly parallels the Platte river across the greater portion of Nebraska. As depressions were created by removal of gravel, water seeped to make ponds in the holes. All parties agreed that at least two of the three birds–terns and plovers–have made use of them. But, FWS biologists intensely resisted any idea of permitting the states to construct a reasonable and prudent alternative with a significant fraction of habitat in scattered disconnected 40--250 acre parcels incorporating one or more sandpits near an interstate highway. On the other hand, the states–especially Nebraska–have wanted explicit program sanction to explore the idea. Such sites are numerous, they can generally be purchased cheaply, and the listed birds demonstrably use them. Should states get credit under the program for providing some significant amount of "alternative habitat?" The states said "yes." The FWS said "no."

There were two possible ways to proceed. First, there was the option preferred by the FWS. Let there be no explicit endorsement of sandpit habitat and wetlands divorced from the river. However, the agency was prepared to defer to the states by indicating that there could be a program of research and monitoring to evaluate the value of the "alternative habitats" over time. As evidence mounted one way or another during the first 10-13 year program increment, the adaptive management process could incorporate lessons. The agency pointed out that it was quite possible to study how sandpits and non-riverine wetlands served the listed birds without actually spending any money on actually acquiring them.

The second option, pushed by the states, was to specify that program monies would be used to acquire habitat units of both types–mainline FWS larger complexes and alternative habitats–and begin early in the first increment to compare one type to another in experimental fashion. This would make acquisition and protection of sandpits and disconnected wetlands an acknowledged program priority. The states wanted this, not only because it made a certain sense, but because it would serve as a litmus test as to the limits of federal flexibility. The struggle was over how to define the arena for discourse about options and about the terms of state-federal

partnership.

Under sustained attack from the states over a period of many months, The FWS refused to shift away from rigid defense of positions taken in its biological opinion. It had good reason to believe, in its view, that the three birds had become listed because their preferred habitats had been damaged and even destroyed. It was not logically defensible, the agency argued, to simply conclude that because a species does not use a given patch of degraded riverine habitat that it does not need that habitat, and furthermore that inferior habitat now occupied (e.g., sand pits) can somehow be defined as good enough simply because the species had been displaced to such places.

The states attacked what they viewed as an agency much too narrow in its vision of the problem and its solution. They advanced what they considered to be better arguments, more creative options, but in a choice between discourse about things not included in the Biological Opinion and defense of that Opinion, the agency had little option but to defend the document that had been the foundation of the entire cooperative agreement effort to build a recovery program. To accept revision of the story set forth in the Biological Opinion would make the agency vulnerable to attack from many quarters, not the least of which would be sharp-eyed environmentalists all too willing to believe that the agency has a history of yielding to powerful outside forces and compromising away the best biology-driven policy.

FWS stalwart defense of positions taken in the Biological Opinion raised questions in the minds of several state negotiators as to whether the FWS could ever permit good science based argument to revise its positions. Logic and science may collide with law and the courts. Is it not possible, representatives of the states asked, for the agency to contemplate the possibility that Biological Opinions may contain errors of commission or omission, that creative negotiations may produce options not contemplated in the original text? Is collaboration in adaptive management to always be constrained by the thinking that went into original opinions? Will the FWS always tread so cautiously out of fear of lawsuits? What does FWS conservatism in defense of narrow interpretations of its biological opinion forshadow for using the best science in collaborative adaptive management when science tends to be tentative in its conclusions, and is often assailable by alternative hypotheses?

Throughout, the FWS held to its position that, at least during the first program increment of 10-13 years, limited resources should be focused on putting in place its top priority habitat– large parcels of river channel, adjacent wetland, and buffer zones. The issue became hotly contentious. Would the FWS count a parcel of land disconnected from one of its idealized habitat complexes as providing a demonstrable benefit if:

1. birds were confirmed to be using a sandpit? FWS: No.
2. birds were confirmed to be using a sandpit and fledging young there: FWS: No.
3. birds were confirmed to be using a sandpit, fledging young there, and surviving to adulthood? FWS: Not necessarily.

The service additionally feared that giving credit to non-complex habitat would reduce the states' willingness to push for land in complexes. Therefore, for months the service held to the

position that, to have a demonstrable benefit, habitat acquisitions would have to be located within, or be adjacent to, an agency endorsed and properly buffered riverine/wetland complex, at least until years of data gathering and analysis could establish beyond any reasonable doubt that sandpits and/or non-riverine wetlands work for the species. Only this position could stave off pressure from: a) the states who were seeking maximum latitude and least cost solutions; and b) environmental critics who feared that the FWS would trade away the best biology to keep its coalition of players together. Representatives of the states muttered about the FWS simply was trying to get its "designer river" at any cost, and did not want to admit the obvious–i.e., that the birds used the alternative sites even more than riverine habitat. But, the FWS held to its position that limited time and money should not be spent on less expensive decidedly inferior habitat.

Compromise

By May, 2002, negotiators had produced a draft habitat protection plan that explicitly reflected some compromise, a gesture toward the states. It included the possibility of spending first program increment dollars on acquiring up to 800 acres of "non-complex habitat lands," as part of the 10,000 acre goal. Several reasons emerged for this move. First, it was clear to all that–at the end of the day–the FWS held effective veto power over the proposed purchase of any piece of habitat. Every land acquisition would require virtual consensus on the part of the Governance Committee and all habitat purchased with program dollars would have to fulfill FWS criteria. Knowing this, agency negotiators could soften the language a bit to assuage concerns of the states. It was a small price to pay for showing some willingness to adapt in a critical early adaptive management process.

There was also a second consideration. The real world would deliver, not neatly packaged units of uniformly high quality habitat, but land would become available on the market as a bundle of mixed qualities. In a real willing-seller/willing buyer situation, sellers would not generally carve up their properties into sub-units categorized according to FWS habitat criteria and sell away only what rigid FWS program language had endorsed. The program would have little option but to purchase lower quality land in order to obtain the best. Battling program language around the negotiating table could not make that reality go away. Decisions would have to be made on a case-by-case basis. Criteria for selection of particular site-specific habitat, after the maps could be brought out to the light of day for limited program affliliated audiences, would emerge in the actual experience of putting the habitat together. Some sandpit and disconnected wetland habitat was seen as at least somewhat likely to be bundled in messy real estate transactions. Why not just diffuse the fight a bit and accept that up to 8% of the acquisitions could be alternative to the main thrust of big connected habitat complexes?

Thirdly, land acquisition requires a speedy and deft flexibility in grasping fleeting opportunities. Willing sellers will not patiently wait for clumsy program procedures and extended Governance Committee debates; recovery program administrators will have to have their general guidelines in hand and be ready to move with dispatch or risk losing out to competitive buyers who have no wildlife agenda in mind. Reality would be messy, dynamic, and no amount of fussy bureaucratic rigidity in the program document could make the world tidy. The Platte River Whooping Crane Trust has been operating in local land markets since the mid-1970's and, with the Audubon Society, had built up much local experience. Representatives of these organizations

would have to assist the recovery program in its habitat acquisition efforts. If FWS rigidity should become a problem seriously constraining effective land acquisition, these experienced local environmentalists will join with states and their water users to pressure the agency into greater responsiveness.

Furthermore, experienced in quality habitat acquisition or not, no one could know which early habitat purchases will eventually evolve into viable large complexes and which will end up as isolated remnants to be eventually sold. There is no option but for all parties to work in good faith, trust adaptive management to work, and hope the FWS will not "blow up" the program and withdraw regulatory certainty because some favorite prospect for a complex fails to emerge as expected.

The Land Committee was established amidst rancorous conflict. After it surmounted that early threat it soon became embroiled again, along with the technical committee, in sharp conflict over how to define acceptable habitat. Negotiators who had earlier agreed to disagree about target flows, had again agreed to disagree about what constituted justifiable habitat. The only way out of the troubled discourse was for the states to recognize that the FWS had a biological opinion to defend and they would have to accept fully configured habitat complexes as the overwhelming component of any viable land program. In turn, the FWS came around to explicitly recognize up-front that there was at least some merit in the states' contention that alternative habitats could also serve species needs. All parties were staking their futures on faith that the areas of their continued conflict could be addressed by faith in a concept that most had never heard of before the negotiations--adaptive management. Informed by the best available science, adaptive management would be used to bind up the wounds left by inability to resolve fundamental issues, but the process would lead them to the salvation of ESA compliance and regulatory certainty. ESA, a tough piece of science dependent legislation, was requiring enormous amounts of good faith. As the law forced big questions beyond the capacity of the best science to answer, faith in adaptive management, science, and civil discourse had to increasingly fill in the gap.

CHAPTER EIGHTEEN:
SCIENCE AS FAITH–PUTTING ADAPTIVE MANAGEMENT TO ITS FIRST MAJOR TEST WITH THE SEDIMENTATION-VEGETATION PROBLEM

Silt has always been the great enemy of reservoirs, diversions, headgates, and canals. Heavy rains washing tons of topsoil into streams has been a dreaded fact of life for irrigated agriculture everywhere. But sedimentation has also always been an essential component of many ecosystem dynamics, a source of soil renewal for river bottom lands, wetlands and the agriculture nested within. An undisturbed braided river is a transitional form on the path to becoming a meandering stream. It is a river with an abundance of sediment and, over the course of geologic time, it will throw loops and meanders. On steeper high country slopes, the energy of high flow velocities have kept sediment in suspension, but as turbid streams reached lower flatter terrain, flows slowed, dropped their deposits, only to be picked up again by the next surge and carried lower.

The sediments of the Rocky Mountain front range have long provided much of the muddy glop upon which lower Mississippi river valley ecosystems and civilizations have been built. Between the upper watersheds and the mouth of the Mississippi, sedimentation had been crucial to the construction of traditional tern, plover, and crane habitat along the Platte. It came to pass that the capacity of basin water flows to move a range of earthen particle sizes would loom large in recovery program negotiations. The problems of moving sands and gravels via Platte flows to the right places and shapes would bring the negotiations to their lowest point, to the very edge of "blow-up." It would not be science, *per se*, that would save the day, because available science did not have sufficient answers. It would be faith in science, within an adaptive management framework, that would get negotiators through to some preliminary resolution, just barely enough to serve construction of a reasonable and prudent alternative.

News

Members of the Governance Committee, their assistants, and other observers gathered in the USFWS's third floor conference room located in the agency's office suite just off Union Boulevard in Lakewood, a western suburb of Denver. It was August 3, 2000, and there had been reason to be feeling good about the direction of things. The water, land, and research/monitoring agreements were sketched even if not fully complete. The forthcoming November elections would put a new administration in place the following January, but there was guarded hope that the recovery program was well enough along to produce a reasonable and prudent alternative that could possibly be signed in the last days of the Clinton administration. If not, the signing could be forthcoming in the early months of the newly installed presidency. The biggest general concern had been Nebraska's political problem in finding sufficient support for the proposed program.

Ralph Morgenweck, FWS Regional Director, opened the meeting with a three minute statement. The EIS team had completed a preliminary analysis of the proposed water action plan (along with other alternatives that the team had constructed over past months with the knowledge and consent of the Governance Committee as required by the National Environmental Policy Act). The EIS team had found that none of the alternatives could serve as a reasonable and prudent alternative. Years of work lay in disarray.

Sediment issues had been mentioned only sporadically in discussions prior to the signing of the Cooperative Agreement, but they had not been part of that document itself. In the discourses that had followed the signing of the Cooperative Agreement in July, 1997, no attention had been paid to sedimentation. Negotiators had pieced together a proposed water action plan on the premise that an average of approximately 130-140,000 acre feet added to the spring and summer flows would do much to help produce the desired wide, shallow, braided river required by listed birds. However, now the laboriously constructed action plan had been found by the EIS team to produce mostly clear water that has dropped its sediment in reservoirs behind North Platte dams. When released for program purposes, this clear water would scrub up sediment and thereby scour out and further incise channels. Just a few months before the December 31 deadline for producing a viable program, the proposed one, as it stood, was estimated to contribute to the very problem it was supposed to help solve.

Morgenweck made it clear that the action plan as negotiated was necessary to any reasonable and prudent alternative, but that–as it stood--it was not sufficient. Unless changes were made, the negotiated program would only aggravate conditions that had led to the original jeopardy opinion in the first place. Furthermore, the issue had to be faced squarely at that time; it could not be deferred. Water users could not expect to obtain regulatory certainty on the basis of what had turned out to be a deeply flawed reasonable and prudent alternative. The FWS was prepared to explore options for constructively dealing with the problem.

This announcement had the potential to unravel everything. Best available science had undercut a key program premise. Negotiators looked at years of effort that was in serious danger of falling apart. Federal authorities, who had frequently expressed frustration with what they had viewed as delay tactics by states and their water users, now had brought forward an issue at the last moment that potentially was a show-stopper and, at the very least, would necessarily cause significant delay. A major extension of the Cooperative Agreement would be necessary and, in fact, by the end of 2000, arrangements had been put in place to extend the deliberations thirty months to June 30, 2003. The additional time would permit further work on many fronts, but the time was especially needed to come to grips with two issues–sediment transfer and the pallid sturgeon, the needs of which on the lower Platte had not been adequately addressed.

States saw great danger in the new sedimentation topic. Was this just one more instance of loosely constructed federal science, in the form of incomplete and insufficiently validated models, threatening to place new, unwarranted, and open-ended demands on state treasuries? Was it ever going to be possible to take a walk into unknown territory with federal agencies and not get "mugged"? Given the succession of dams on the North Platte, the major source of sediment would have to be Colorado's South Platte. Would that mean a major re-negotiation of Colorado's contribution at Tamarack? Would the federal agencies push for releasing sediment laden water out of a reservoir or two above the Balzac gauge–the compact firewall–and run it on the crest of spring flood pulses? This kind of possibility provided grist for a Colorado nightmare.

Would the FWS be prepared to actually require the insertion of sediment into the river at NPPD's Keystone diversion where that district had been continuously struggling to remove the build-up for decades? What would major insertions of sediment do to people who lived along river? The Nebraska negotiating team had all too few constituents behind it pushing for the

recovery program as it was. The program could lose much of what little Nebraska support it enjoyed if locals started thinking about having federal agency managers somehow enter into Nebraska Platte river management with all too little regard for their well-being. Also, for years, farmers in all three states had worked with USDA's Natural Resources Conservation Service (formerly the Soil Conservation Service) to learn how to minimize erosion of soils into the river. Now, a federal agency actually wanted to put sediment into the river to build sandbars! To many, this was just another instance of the federal government's right hand not knowing what its left hand was up to.

States were perplexed that the FWS had seemingly acted with capriciousness in suddenly changing the rules of the game so late in the negotiations. Up to this point, the route to regulatory certainty had been paved with commitment to re-regulate water, and by acquiring and managing habitat plus doing some research and monitoring. The states had a sense of clearly defined contribution. Now, it appeared that the FWS wanted the program, in an open-ended kind of way, to somehow manipulate more than 80 miles of river above the critical habitat, a long segment that any conceivable program flows could impact only in a marginal way. The states would be wide open for on-going undefined commitments forever. How could such a proposal be ushered through any state legislature even if it made sense to try. A program would have to be devised. What program? Who knows? How much time was there to think about this? All too little.

Morgenweck's official August speech on the subject was not entirely a surprise to those who had been following negotiations closely. In Sterling, Colorado, the preceding April 25th, after a day of Water Committee meetings, and prior to the fully assembled Governance Committee two days later, the FWS and the USBR/EIS team organized an evening presentation that signaled their concern with the sedimentation problem. The sediment transport model that had generated problematic results was unfinished, uncalibrated, and the data shared in the Ramada Inn conference room that night could not justify any particular conclusion. But the federal partners wanted to share their concerns and the evidence as it existed at that moment. After all, the finished version of the proposed water action plan was due May 15, a deadline only three weeks away. The sediment model, one that nobody wanted to trust yet, produced many preliminary results one of which was that a segment of wide river, enhanced by program flows, eroded a trench on one side of the main channel as deep as 25 feet. This was not what anybody wished to hear. Program flows might be canyon makers!

Nobody took the particular figures too seriously, but those in attendance were put on notice. Something was seriously wrong with the proposed water action plan and it would have to be fixed. At the May Governance Committee meeting the issue was again discussed; the BOR/EIS teams sediment transfer model was being improved. Prospects were not bright for the proposed program to pass muster. Later, during the last two weeks in July, after the EIS team had completed its assessment, Governance Committee members were informed in advance by Ralph Morgenweck via telephone that there was no viable alternative in sight and, at that point, nobody had a clear idea of what to do fix the problem.

The sedimentation issue revealed something about the limits of available knowledge in dealing with complex and theory-defying ecosystems. Various hydraulic models of at least portions of the river had been employed for years. Other models were available that examined

interactions between soils, water, and vegetation. But there had been no rich history of putting hydraulics of water flow together with vegetation growth patterns. Everybody had much to be humble about in the face of the sudden eruption of the sedimentation problem in negotiations.

Federal Case

The FWS saw in this episode a prime example of the need for effective adaptive management. Science had instructed players on a crucial point that had been overlooked. The key to everything would be to keep focused on the needs of the species. Basically, the problem for the species had been caused by federal dam and reservoir projects on the North Platte plus the non-federal big Lake McConaughy that trapped sediment and released clear sediment-starved water. The South Platte has a slightly higher rate of fall across its plains section as compared to the North Platte, a good thing for picking up sediment. Furthermore, there are no on-stream plains reservoirs downstream of Denver to serve as sediment traps. Therefore for most of the twentieth century the South Platte has served as the main source of sediment to the Central Platte. But it is a smaller stream still compromised in its sediment production potential by some upstream dams and off-stream reservoirs. All this means that human and natural forces have not established a dynamic that digs enough holes in the South Platte to fill the sediment needy holes of the central Platte.

Timing

Why then? Why did something so potentially damaging to the negotiations come up within a year of the scheduled deadline for bringing negotiations to a close? The FWS knew that the issue of channel stability and incision was lurking in the background ever since the first biological opinion was issued that precipitated negotiations with FERC, CNPPID, and NPPD in the 1980's. FWS authorities had a perfectly straightforward explanation for their delay in broaching the topic. The issue had been identified, but there was no modeling tool available in those earlier years to address it. BOR scientists began developing the model that eventually provided the methodology for the BOR/EIS team's negative evaluation of the proposed program, but there had been no FWS dollars available to look at sediment implications until after the USBR/EIS team was assembled and it would be USBR/EIS team dollars that would launch the eventual modeling effort. As soon as that model could generate results, however crude, the FWS and the BOR/EIS team had little choice but to share them at the April session in Sterling. The FWS had no recourse but to place the topic on the table; if time was running out given the December, 2000 deadline, that was simply unfortunate for everybody. In an imperfect world the agency could do no more than the best it could. If that left too little time to work out a solution and an extension of the Cooperative Agreement period was necessary, that is just the way things would have to be.

Without contradicting any of the facts in the FWS explanation, some have ventured the speculation that the FWS may have found it awkward to push for the speediest possible sediment-vegetation modeling in an environment where the agency was busy defending its target flow figure of 417,000 acre feet per year and using it as a "nut pick" to extract water contributions from the states. That target flow benchmark was a centerpiece of the federal jeopardy case against state water users. Clearly, if there were to be a well-developed picture of serious problems of channel stability being caused by increased flows, it could cause problems for the agency's target flow

rationale at a time when states were casting about for any stone to throw at the FWS target flow argument. If such were the case, then the FWS had a ticklish problem. On the one hand it had to keep faith with its own biological opinion by extracting water for re-regulation from users to enhance spring and summer flows. Yet, on the other hand, it would sooner or later would have admit that the problems of improving riverine habitat were not a simple function of increased flow volumes. Later discussion of this complication would plausibly be better. To introduce the thought too soon that increased flow volumes were likely to cause problems of channel stability and incision would not be the best tactic to push state water users into coughing up 130-150,000 acre feet for re-regulation. Waiting for the water action plan to be in place before introducing the channel incision issue just might have been thought to be DOI's best course of action.

Federal representatives have clearly rejected such speculation. They note that they were attempting to do the best job possible with tight budgets, overworked staff, and river modeling challenges. There was insufficient time, will, knowledge, or energy to be arranging any conspiracies. They had no crystal ball with which to peer into the future, and thereby no opportunity to even think about, let alone attempt, possibly timing the release of their most preliminary sedimentation-vegetation analysis to retain any alleged advantage in earlier target flow discussions. There are two discussions here–one about target flows and another about sedimentation-vegetation. The FWS approached them separately.

Sedimentation-Vegetation

After the lowest dam on the North Platte, Kingsley, shut its gates for the first time in 1941, the central Platte eventually stabilized around a new regime of clearer and more constant flows that eroded listed bird habitats upstream of Kearney, Nebraska but–in the view of the FWS--still supported a residue of good bird habitats downstream. The FWS contended that, during periods of low flow, vegetation was established as it always had been, but thanks to Kingsley and the other dams above, the river no longer provided sufficiently high pulses to move sediment and scour out seedlings, leading to the growth of densely vegetated islands and river banks. The river, in this view, then tended to deepen because when higher flows did occur they tended to be less erosive of densely vegetated river banks and islands and more erosive of channel bottoms. The river thereby became more channelized.

By 2000, preliminary studies had revealed that proposed program enhanced water flows would quite likely cut deeper narrower channels that would further degrade that prized but limited residue of bird habitat (Murphy and Randle 2001), (Simons and Associates Inc. 2000). Given all this, the FWS saw that increased channel degradation had been slowly progressing from western upstream areas to eastern downstream points (See Table 3). It found upper reaches of the big bend river to be much more wooded and narrower than further downstream where the good habitats have survived in the lower part of the big bend stretch. The objective of any viable program would be to halt (and reverse) the slow advancement of increased downstream channel incision and narrowing.

Table 3 Average Channel Widths in Feet, 1865-1998

Year / Location	1865	1957	1998
Upstream at Overton	4900	1000	800
Downstream at Grand Island	2800	1900	1300

Envisioning a Solution

In the summer and fall months of 2000, insufficient knowledge and the near breakdown of talks over the issue prevented the making of any detailed plan. In attempting to get the conversation with the states moving ahead, the FWS advanced some general concepts. Knowing that the sedimentation-vegetation issue had brought the collaborative process to a virtual stand-still, and the whole discussion was on the thin edge "blowing up," FWS Regional Director Morganweck called on all parties to engage with the technical discussion of channel stability, sedimentation, and vegetation and to enter into new policy talk about revised options. He reached out to the states by giving assurance that the FWS was not using the issue as a device to eventually seek more water or terrestrial habitat.

At the May, 2000, Governance Committee Meeting at the Herschler State Office Building in Cheyenne, the FWS had promised users that the agency would put together a statement indicating, in general terms, what it would take to construct a winning program. By September that package of basic concepts had been drafted and was in circulation among negotiators. In essence the proposal was to employ the philosophy of adaptive management to increase the active area of the river channel–within existing banks–by reducing flow velocities, and preventing the encroachment of vegetation between banks. Knowing that messing around with the riverbank properties of hundreds, if not thousands, of Nebraska property owners would be the "kiss-of-death" for any proposed program, the idea was to obtain the necessary habitat characteristics within existing river channels. It was estimated that removing vegetation from islands and moving sand off of higher islands, there could be as much as a 50% increase in quality bird habitat. This would entail implementation of several management practices:

1. There would be an increased emphasis on generating "peak flows" from whatever sources were available; the biggest of these would be the environmental account at Lake McConaughy re-charged by waters held upstream at Pathfinder and Glendo. Over time an elaborate schedule of peak flows would evolve, but the central thrust was to organize annual peak flows of 6,000–8,000 cubic feet/second (cfs) for an average of 3 days two out of every three years. Peak flows, along with scouring action of late winter/early spring break up of ice sheets, would rip out young vegetation and prevent it from flourishing.

2. To cope with the clear water erosion problem, the concept was to bulldoze island

sand into the stream--about 500 tons of material per day for varying numbers of days depending upon wet, dry, or normal year conditions--to destroy the larger higher islands that had evolved with dense vegetation and to create a constantly shifting pattern of barren sandbars, the kind of habitat suitable for migrating whooping and sandhill cranes, and nesting piping plovers and least terns. For example, sand added to the channel at the rate of 500 tons/day could typically amount to 100,000 cubic yards of material per year, or the equivalent of about 20 acres of island sand cut to a depth of three feet per year. Over 64 years this would cumulate to two square miles of island area.. Island chopping, smashing, and pushing would lead to river sandbar building and a net increase of braided river.

3. To serve policy needs, protocols would be devised to guide systematic gathering of data to determine effectiveness of the manipulations. This would become a major research and monitoring activity.

The FWS was clear that the proposed "concept package" did not mean the agency was attempting to take the river back to the pre-dam 1865 river. It did intend, however, to increase the usable habitat of braided channels cleared of vegetation, and to reverse as much as possible the heretofore advancement of degradation toward Grand Island. The river would necessary remain constricted at bridges but the channels were expected to re-widen between these structures.

State Response

States were a bit less interested in keeping their eyes on species needs and much more focused on holding together the architecture of their negotiated agreement, a deal that up to that point had promised what they wanted most–regulatory certainty. Visions of that were infuriatingly evaporating. The best available models of sedimentation-vegetation dynamics were very new, crude, incomplete, untested, and could not distinguish–within their wide error-terms–a degrading from improving river. Yet, these admittedly inadequate models of complex river phenomena were being used to reject the proposed program and to make policy. The states wanted to know how regulatory certainty could ever be a meaningful concept if DOI kept reserving the right to re-think program matters at the last minute, and withdraw the prize of regulatory certainty with the emergence of any new issue rooted in questionable interpretations of inadequate models and data.

If regulatory certainty was to be anything more than a wisp that appeared and disappeared for less than compelling reasons that have not been carefully examined by all parties, why have the states been at the table for years pounding out program components? States alleged not so much that DOI was doing bad science, because many had the highest regard for the federal sediment-vegetation modelers. They were angry because DOI, with its positions encapsulated in the stone of Biological Opinions and ESA sufficiency mandates could not be humble enough to sit with them, admit that too little was known, sign off on the proposed program, grant relief from jeopardy, and then work collaboratively in an adaptive management mode to address the problem.

Emotions within state delegations were running strong. Some in each state advocated a confrontational approach. Pull back the entire water action plan and start over. Go back to square one! In the Colorado delegation, there were those who simply said it was time to go to

court and put the Colorado-Nebraska compact up against the ESA in a way that would trim back federal authority, and break the federal case once and for all. But, in quieter moments, prudence dictated that the states would abandon thoughts of rash action. Nobody wanted the dead body of a failed program placed at its doorstep. If Colorado, with Nebraska's consent, should undertake a final once-and-for-all legal battle it would be risky, expensive, time-consuming. Blowing up the program would deprive water users of their temporary grants of relief from jeopardy. And, if Colorado and Nebraska should lose, all would be lost forever. Wyoming was not ready to push such an extreme tactic, Nebraska just wanted to play for time, and Colorado decided discretion was the better part of valor.

October 2000 discussions went poorly. DOI was attempting to advance its concept package, but the states were intent on figuring out their troubled state-federal partnership issues. Some state representatives just kept "shooting" at the federal negotiators, and the FWS felt it had little recourse but to openly state that, while the agency wished to receive constructive input from the states, it reserved its right under the law to reject state positions. Negotiations had reached an all-time low point. To the states, the FWS had pushed too far in its quest for a "designer river," and had badly overreached its flimsy scientific case. No matter what you gave them, a common state sentiment had it, the FWS would want more.

To federal representatives, the states failed to understand that the ESA was about the needs of species, and that the FWS had a mandate to serve their habitat requirements. States needed to quit being so paranoid, stop whining, step up, and engage in constructive problem solving. Furthermore, state allegations that federal authorities want a "designer river" cannot pass the "laugh test." There is a designer river out there to be sure, but it was "designed" by the state water users and, in some instances, their USBR partners in years of dam building and canal construction, and its "design" has been found to have created jeopardy for listed species.

Given that emotions ran strong, and given the difficulties of conducting the necessary analysis at the level of the Governance Committee, the parties agreed to return matters to the sub-committees–water, land, and technical–and see if constructive discourse could build at that less political level.

Target-flow Implications

The states took cold comfort in pointing out that they had been proven right all along about DOI's target flow analysis. Now, by the FWS' own lights, it was clear that quality species habitat was not a simple function of enlarged flow volumes, the central premise of the proposed water action plan. If annual average flows of less than 140,000 acre feet per year could do damage to the river, think of what 417,000 acre feet/year could do! There would not be enough islands to churn up to put a meaningful sediment load in that kind of volume. Maybe, the states suggested, that habitat improvement would prove to require even less than the negotiated first increment target flow figure of an average of 130-150,000 acre feet per year. Such talk had little consequence for anything at the moment, but there was an implication here for negotiating subsequent target flow figures in future increments.

Struggle For More Agenda Control

The ESA had always driven the agenda. But, over the years the states had worked out ways to "buy-into" the program. Work on water, land, research and monitoring had created something of a collaboration. But now, suddenly and with all too little advance notice, the FWS had made some highly questionable projections from a sediment-vegetation model that all admitted was inadequate as it stood, and used those projections to insert a whole new agenda into the discussion. The agenda had been hijacked and states were suddenly thrust into the position of reacting to a federal initiative.

Would FWS use its control of the sedimentation issue to place specific program requirements on the states up-front as a condition of getting a reasonable and prudent alternative in place? This could mean re-thinking many parts of the program under duress of limited time, and that could become scary. Colorado was particularly alarmed that discussions would turn toward possible sediment sources in Colorado South Platte reservoirs, something which could scramble the carefully laid set of trade-offs that went into Tamarack. Furthermore, the FWS had no clear standard for how wide a channel needs to be, or how sediment should move in it. The states could not simply let the federal authorities treat such an important program outcome as though it were pornography–leaving DOI to just "know" when the sediment-vegetation dynamics are "right" or "wrong." The states needed to regain some initiative and there was a way to do it. Bring on more science and model building.

The FWS had been saying that, while its science was not perfect, it was good enough to: a) justify rejection of the program as it had been so far developed; and b) to serve as the basis for devising a revised action plan that could prevent further river degradation. These assertions were open for review. As a way to regain at least some initiative, the states would have to hire their own consultant and pay the costs of a thoroughgoing review of the federal sedimentation-vegetation logic. The effort would be well worth it if serious questions could be pursued, and legitimate areas of uncertainty be opened up. Expectations were not so much that weaknesses in the federal case could be used to sustain an anti-federal lawsuit–the federal science was probably too good for that–but problems might be found that would require federal humility in the face of uncertainty, the kind of humility that acknowledges multiple interpretations, alternative possibilities. That just might keep "sed-veg hell" out of any program agreement where it would be tied closely to FWS acceptance of a reasonable and prudent alternative. Then the states could put that "hell" into a post-agreement adaptive management mode.

By November and December, 2000, with an extension of the 1997 Cooperative Agreement in place until June, 2003, the states were making progress in putting together their solicitation for consultant help. The FWS, at first, did not warmly embrace the idea. Tension increased in January-February of 2001 as word went out to the effect that the FWS was not taking kindly to review designed entirely by the states and the states, in turn, ventured the thought that FWS was arrogant. The FWS openly worried that the states might generate unacceptable options.

State Peer Review Becomes State-Federal Science

At the January, 2001, Governance Committee Meeting in Cheyenne, the states announced

that they were well underway toward having a consulting firm employed by March and that their contract would stipulate a report by August. A senior federal decision-maker made a case for full sharing of analysis between the states's contractor and the BOR/EIS team. Tension in the room was broken and laughter generated in Wyoming's Herschler Building conference room when a participant suggested that "Maybe we can do data exchange the way nations do prisoner exchange. When one side delivers, it gets the other side's stuff immediately." It was a light comment on a serious situation.

Parsons Engineering Science of Denver, Colorado, was hired to do the peer review. It began work in late March, 2001, presented the essence of its findings in a July workshop, delivered a draft report in August, and submitted its final report in January, 2002. Parsons was guided in its work by a three member team, one from each state. Parsons had been hired to address the issue of FWS credibility on the issue of sedimentation-vegetation. There were two ways for the states to lead Parsons: 1) reject the federal plea for collaboration and attempt to use the Parsons work to drive wedge between the states and the BOR/EIS modeling team that would set up a confrontation with the FWS; or 2) to use Parson's review effort to collaborate and share perspectives.

The choice was to collaborate. In the spring and early summer months of 2001 an agreement emerged that Parsons and the EIS team should work openly together. On a mutually accepted premise that a complete understanding of the processes determining the shape of the river channel did not exist, they would work to improve the existing BOR/EIS model to the extent possible, and to produce a plan for continued systematic investigation of the physical channel, sediment, and vegetation dynamics with an eye to finding the best channel restoration methods. All of this would be eventually incorporated into the program's Integrated Monitoring and Research Plan (IMRP).

The Parsons' team undertook the contract with the understanding that it would review a finished federal product and arrive at a formal set of findings to be presented on behalf of the states. That did not happen and, as it would turn out, be for the best. The federal work had not been yet produced in a neat, tidy, and final package. Initially, the Parsons/USBR attempt at collaboration was troubled, but soon a state-federal decision was made to have the Parsons' team join in the unfinished analytical USBR/EIS team effort. In the end the Parsons review led to several lines of collaborative inquiry. As the Parsons' team examined the several aspects of the federal analysis, it built linkages with the federal BOR/EIS group and entered into systematic discussion as federal people advanced their own model to a more finished state. As word got out to the effect that Parsons and the federal team were sharing modeling approaches, and that the EIS team had refined its sedimentation-vegetation model, in part thanks to constructive exchanges with Parsons, negotiators representing the states became more comfortable with the direction of things.

In anticipation of releasing its draft report in mid-August, the Parsons team presented their findings to the assembly of negotiators and staff people on July 17, 2001. The workshop was chaired by a senior Colorado representative who welcomed everyone and noted that the "...objective was to share data, hypotheses, information, and to avoid litigation." Parsons analysts took the floor to note that they had relied heavily on data from the BOR/EIS team and 350 other

sources. They did not attempt to replicate the federal model; given the constraints of time and money, Parsons reviewed the EIS team's model, data, and interpretations. Furthermore, Parsons had identified data needs that would have to be addressed in the future.

What did it all mean? Were the BOR/EIS teams conclusions justified? In quest of an answer, Parsons identified twelve "building blocks" of the EIS argument. Each "block" was then examined systematically for its uses, deficiencies, and limits. In the course of this, discussions had been collegial and problem-solving. In addition, Parsons investigations went beyond the 12 building blocks and asked questions not raised by the original federal effort. For example, Parsons examined the impact of regional climate variations that were not addressed by the federal team. It found that, given considerable variation in the natural climate cycle, that it was not justifiable to simply pick a spot in the larger cycle and think that such a point represented the "natural river" as the federal analysts had done in selecting the 1860's as a baseline.

Parsons analysts found that, while pulse flows are important to the dynamics of sedimentation-vegetation, the federal argument had over-stated their significance. Evidence suggested, said Parsons, that the break-up and movement of ice sheets, independently of flood pulses, was a more important channel scouring mechanism than pulse flows. BOR/EIS team assumptions that provided foundations for specific logics within a few the 12 building blocks were found to be based upon insufficient data. In sum, the Parsons team concluded, that while there was much to recommend the federal sedimentation-vegetation analysis, the federal team had been found not to have adequately supported its conclusions. There were important unresolved questions that needed to be addressed before the federal model could be employed to adequately justify decisions about the sufficiency of any proposed program alternative. The way out, then, would be to place the whole issue in the hands of an adaptive management methodology for the first increment.

Collaboration between the BOR/EIS team and the states' contractor had, by that time, reached a level that together they placed on the table a plan to test alternative hypotheses about sedimentation-vegetation dynamics. The plan centered on performing pulse flow and "island squishing" tests, beginning with small ones and incrementally increasing their scale. Such tests would be preceded by detailed evaluations of channel capacity and initial flow pulses would be held well below those capacities. Tests would be run only in dry weather conditions and be coordinated with highway and bridge maintenance crews. Numerous observers would be placed at strategic points along the channel with a check-list of items to guide systematic documentation of conditions prior to, during, and after each pulse flow. Tests would be implemented before or after the irrigation season so that diversions and water deliveries would not be negatively impacted. The number and acreage of islands proposed for initial "squishing" would be small, only about 5% of the acres needed according to BOR/EIS team estimates. All tests would be performed early in the first increment so that there would be time to identify most-favorable treatments and begin to implement them on a wider scale before the end of the first 10-13 years. The Parsons and EIS team even provided a first program increment cost estimate for conducting the work. There must necessarily always be a conflict in designing such river restoration treatments between: a) the big treatment allowing a full test of efficacy; and b) the low risk test that makes measuring and interpreting effects more challenging, but those considerations were to be addressed in the future. At that moment, the important fact was that negotiations were getting back on track.

Resolution

"Ultimately, this is a voluntary program. We cannot pit one interpretation against another and thereby create a stalemate. We need to find a way around that."
Senior federal negotiator

Federal authorities, given the nature of their sedimentation-vegetation science and Parsons critique of it, and given the many unknowns that inevitably ride with manipulations of complex riverine ecosystems, were not in a position to specify any particular sequence of actions that could be required as part of a reasonable and prudent alternative. The Parsons study had paid off for the states; it had created a sufficient number of new questions and grounds for doubt that the FWS had to admit to the need for a longer term learning process. It would have foolishness of a high order to lock program participants forever into a particular path of action that could not be based on minimally adequate understanding. But, it was quite possible to contemplate writing into proposed program documents an aggressive adaptive management agenda. It was clear that the North Platte dams–particularly Kingsley--could open gates and provide flood pulses, while the South Platte would continue as it had for almost a century to be the most important source of sediment. Within this general frame, the FWS would stand firmly for a few essentials–e.g., minimum channel widths–but simultaneously work with the states to determine what produces wider braided channels.

As for the states, "sed-veg hell" had been wrestled into a shape that they could live with. At that moment there was reason to believe that the fearful specter of trying to micro-manage more than 80 miles of river above the critical habitat was dissipating. Sediment, once again, had become only one of many factors affecting the character of streambed and riparian zones. Instead of having a separate and perpetually contentious sedimentation component in the program, there would be a revised action plan that recognizes the problem, admits to the associated uncertainties, encompasses multiple hypotheses for testing, and be open to participatory discourse. They could now live with a future that would incorporate experimental action, monitoring, research, creation of new options, talk, more action, more monitoring, more research, talk, revised options, action....

All parties had side-stepped an issue that could have collapsed everything. They had been as deeply polarized as at any time since well before 1997. The meaning of federal-state partnership had been at stake. Federal representatives of the Department of Interior faced state representatives as opponents on at least three critical conflict cleavages–acceptability of alternative habitats in the land discussion, the meaning of the sedimentation-vegetation problem, and now the advisability of states undertaking their own independent review of federal sedimentation-vegetation science. They had become adversaries on all of these issues, allies on none. The cleavages had stacked up in a polarized pattern, the legitimacy parties were attributing to each other was diminishing, and their sense of mutual interdependence was turning decidedly in the direction of a zero-sum game; what one side would win the other had to lose. There were, however at least two large cross-cutting cleavages that provided common ground and kept them at the table: 1) a tough ESA that held out the prospect of individual accountability for construction of reasonable and prudent alternatives as the price of failure–an outcome wanted by no party; and 2) a mutual commitment to the value of open scientific inquiry to reasoned inference. An independent review that could have been employed to heighten confrontation and division became

a place where quiet technical talk could set aside partisan posturing, cool emotions, build linkages among adversaries, and eventually lead to a joint plan for adaptive management. This became the stuff around which a future relationship might be forged. The mutual commitment to science grew in a context where a powerful ESA provided the strongest incentive to make a state-federal relationship work. Rigidity in the law was essential to keeping negotiators together and, in this instance at least, it did not prove to be an obstacle to flexibility of action.

CHAPTER NINETEEN:
VICTORY AND IMPASSE

Context

In years leading up to 1994, water users in the three states had found themselves in a largely unwanted relationship with the United States Fish and Wildlife Service as that agency pursued its mandate to implement the Endangered Species Act (ESA). After years of struggle, they had slowly, haltingly, painfully come to realize that:

1. The ESA was not going to disappear–there simply was too much political support for it across the nation–especially in the heavily populated states along the Atlantic and Pacific coasts, and also among publics across the land that, whatever their ideology, were interested in advancing recreational and environmental values.

2. No single user could address the complex expensive and large landscape scale issues that had to be addressed in order to do restoration of critical habitat. Concerted basin-wide action was the only way out.

3. Any settlement would require innovative solutions well beyond anything the USFWS could muster with its limited resources. The problem of re-regulating basin water and managing habitat would require abandonment of the traditional federal agency command and control regulatory mode. Collaboration with all the stakeholders would be essential.

4. The ESA confronted all parties, especially the USFWS, with a huge challenge of implementing the law in the context of mind-boggling ecological complexity, conflicting stakeholders, uncertain science, limited time, money and expertise.

In June, 1994, the Governors of each of the three states and the Secretary of Interior had signed an agreement to talk. Three years of tough discourse followed that would lead to the Cooperative Agreement of July, 1997, which did provide a negotiating framework within which a proposed Platte River Recovery Program could be developed by 2000. Any proposed program would have to pass muster with the USFWS team who would determine whether or not it could serve as a reasonable and prudent alternative to modifying or shutting down water operations that had been found to be imposing jeopardy on listed species. By mid-2000, construction of that reasonable and prudent alternative was well along; a water action plan had been outlined, terrestrial habitat plan had been sketched out, and protocols for research and monitoring efforts were being put in place. However, the sedimentation-vegetation issue had emerged in April, 2000, and would eventually lead to a FWS judgment in August of that year that the program as constructed could not serve as a reasonable and prudent alternative. Clear program water could reasonably be expected to further incise channels rather than braid them. A promised 10-13 year period of regulatory certainty for the users, so tantalizingly close, was going to continue on a more temporary basis as the Cooperative Agreement would be extended to the end of June, 2003. The extension was necessary to seek solutions and finish up work on other program components.

Negotiations leading up to, and during, the first three year cooperative agreement period (1997-2000) had moved, albeit slowly, in a generally supportive context. The essentials of water, land, and monitoring were hammered out during a time of a generally expanding economy, rising state and federal tax revenues, and for the most part above average moisture years. The poor agricultural economy of the mid-to-late1990's was deeply troubling to water users and constrained negotiators. Wyoming and Colorado were, however, pushing ahead. Nebraska struggled the hardest to frame its contributions to the program in a manner that could earn sufficient support in its divided house of irrigation.

However, negotiations, from 2000 to 2003, had played out within a more ominous context. In Washington, D.C. the newly installed Bush administration was not as eager as Clinton's had been to push the ESA and other environmental agendas. In Colorado, in January, 1999, the Owens administration had come to power with a visceral dislike of the ESA; furthermore, it was troubled by the thought of what would be tantamount to a federal water right coming on the South Platte, and articulated a deep skepticism of what South Platte basin water users had put together at Tamarack. Then the national and regional economy faltered, trillions were lost on the stock market, federal and state budgets fell into deficits. A war on terrorism, drought, and record breaking wildfires across the West became compelling subjects that occupied federal and state authorities. Platte River recovery program matters were never high on the list of senior federal or state authorities–they would never get mention in state-of-the-union or state-of-state messages. Now, other agendas promised to drain away even more money and attention. Things had never come into perfect alignment by 2000, but by mid-2002, they seemed to many to be moving steadily off course.

Victory and Silence

On July 17, 2002, in a Holiday Inn conference room in Kearney, Nebraska, negotiators and other participants in an USBR/EIS team workshop heard results of an analysis performed with the EIS team's enhanced sedimentation-vegetation model. The news was good. A way had been found to make the water action plan work by decreasing the frequency of low flows, increasing the frequency of pulse flows, increasing spring-summer base flows for species, and reducing winter flows. All this would come at some cost to storage and future drought protection, but the big thing of the moment was that the upgraded model of the river showed that a revised set of program flows could pass muster if they were properly integrated with clearing and leveling of 750 acres of wooded islands in 5 bridge segments during the first 10-13 year program increment.

The model produced numbers that showed island "squishing" along with other practices would mitigate clear water channel incision. The combination of island manipulations and program water releases was estimated to increase areas of channel to widths greater than 750 feet in four of five bridge segments. Furthermore, the model showed pulse flows building low sandbars that yet would not be inundated by summer peak flows, something important for plover and tern nesting. Bird sight distances increased to acceptable values. Modeling had shown that cross-sections of the river that would get the program treatments for 13 years would be sustainable over 48 years with much less vegetation management in the second and following increments of the program. The program could produce the essential geomorphological results and could pass muster for whooping crane habitat. More work would have to be done to get it right for terns and

plovers.

After years of pulling and hauling, the negotiations had produced a proposed program major components of which could work, could serve as the greater part of what could eventually be a reasonable and prudent alternative, could be the source of relief from jeopardy and regulatory certainty! Yet, the states' delegations took the good news without any visible display of joy or any other emotion. No laughter, no handshakes, no relieved cries of congratulations. Stoic silence governed the moment. What was happening?

The problem, of course, was that the EIS team had just given a positive evaluation to a proposed program that was a source of serious division in Colorado and Nebraska. Negotiators representing these two states were faced with the awkward prospect that their "preferred alternative" had significant opposition back home. Nobody in the room found it pleasant to contemplate putting an EIS on the street without having full good faith backing of the program in central Nebraska as well as in Lincoln and Denver. A federal leader asked: "Does anybody really want an EIS on the street that has states disavowing it?" Silence. . . Federal voices then expressed a wish to know when the three states could step up, declare agreement with the proposed program, and actively move ahead all the details that would have to be put in place so that the three governors could sign-off in less than a year–i.e., June, 2003. Federal voice: "We are at our wits end trying to figure out how to drive this process forward!" Silence. . .

There could, at that moment, be no easy answer to the federal question. Nebraska and Colorado presented opposite problem profiles. In Nebraska, state authorities working with the two districts in need of permits at Kingsley Dam–NPPD and CNPPID--had carried the negotiations forward, had imagined the shape of solutions, and had initiated, in cooperation with some Natural Resource Districts, the COHYST study of groundwater. But a high proportion of local people on the river beyond the domain of CNPPID, ostensibly represented by their Natural Resource Districts, had never meaningfully participated in program formulation. Most, especially the groundwater users, saw nothing in the program that they particularly liked. Natural Resource Districts were either largely dis-engaged from the process or, with little exception, were decidedly unenthusiastic. Now, Nebraska leaders were occupied with using a National Academy of Science review of program science to buy time. Time was desperately needed to build something of a better coalition of support for the program. Time was needed to help Nebraskans understand, that even without the basin-wide recovery program, there would have to be constraints placed on groundwater use just to protect Nebraska senior surface right holders from the depredations of groundwater users. The fact was that the Platte River Recovery Program activities along the Platte would have some positive spillovers for doing what Nebraskans needed to do anyway. But there was yet no sufficiently effective constituency making this argument across the central Platte landscape. Those problems kept the Nebraska delegation quiet.

In Colorado, it was a coalition of local water users sharing South Platte waters that had created the Tamarack solution, fitted it to the requirements of Colorado law and of the local communities of water users, and were now faced with trying to sell their efforts to a resistant Bill Owens administration. Colorado water people in the South Platte Lower River Group (SPLRG)–Denver Water, Groundwater Appropriators of the South Platte (GASP), Lower South Platte Water Conservancy District (LSPWCD), and Northern Colorado Water Conservancy

District–had found supportive allies in the administration of former Governor Romer. But that same level of enthusiasm was not to be located in the upper echelons of the Owens administration that had come into office in January, 1999.

The internal Colorado debate had come to center on the disposition of South Platte peak flows. It was always troubling to Colorado water people of all political stripes that the FWS placed such a high priority on insuring that they be preserved to some, as yet unspecified, extent. The FWS had clearly stated that, under the proposed program, it would work to minimize any reduction in the frequency and magnitude of South Platte peak flows on the grounds that they are essential to conservation of riverine ecosystems. Any proposed future water project would have to reviewed by the FWS under Section 7 of the ESA. A key question would be: does a given newly proposed project (i.e., post July 1, 1997) qualify for coverage under the Colorado future depletions plan? Colorado negotiators asserted that their future depletions plan–Tamarack Phase II waters–should be accepted by the FWS as full mitigation of any depletions new projects would impose, with the possible exception of extremely large ones on the scale of a Two-Forks or a Narrows storage project. The FWS had made clear in text and flowcharts that, under terms of the agreement, any new project would not automatically be included under the depletions plan. Each project would have to be examined on a case-by-case basis to see if, the view of the FWS, the proposal would likely impose an unacceptable impact on peak flows.

In effect, this FWS position rejects the Colorado future depletions plan as a sure-fire protector of any new projects that would employ flow peaks as their supply source. Colorado has asserted that the FWS position is uncalled for, because the state's future depletion plan had been accepted as part of the 1997 Memorandum of Agreement on the premise that it would cover new Colorado depletions without qualification. The issue could be a show-stopper. Colorado simply cannot allow the FWS to unilaterally declare any new water use project as beyond coverage of the state depletions plan, and the FWS must defend peak and pulse flows that carry sediment and scour islands and banks. The best possibility for surmounting the issue is for the FWS to accept depletions plan coverage of new depletions up to a specified level of river flow and for Colorado to accept negotiation of any new depletions beyond that level. The Owens' administration, however, had jumped on the peak flow issue to argue against Colorado participation in the program. At this writing no one knows how the internal Colorado discussion will come out. Would the Owens administration walk away from what the South Platte water users have built in the name of ideological vision and fleeting flow peaks? Would water users somehow convince the Governor and his senior political appointees that the state's best interests will be served by a proposed habitat recovery program that will allow at least some peak flows be open to negotiation with the FWS on behalf of a basin environmental agenda? Would federal negotiators–supported by Nebraska intense desire to maintain "regime of the river"--rigidly claim all peak flows? Would they be willing to divide the peaks up with Colorado? Whatever the eventual answer, the struggle between water user promoters of the recovery program, and senior Owen's administration authorities, kept the Colorado delegation quiet at the table in Kearney.

The peak flow issue was also huge for Nebraskans who also could clearly see that peak flows are a primary source of water with which to replace new depletions. A FWS position that such flows could not be diverted, without case by case federal review and sanction, amounted to an unwelcome direct attack on state water sovereignty. Nebraska, like Colorado, has extreme

difficulty with any FWS coy unwillingness to explicitly commit to specific terms and conditions under which peak flows could be available to state water users.

Having a pretty good sense of what was troubling its two neighbors, Wyoming refrained from overt celebrating. But, Wyoming wanted the program and gladly accepted the message that the sediment-vegetation issue had been successfully addressed. There were yet a few outstanding issues to be worked out–something more for piping plover and least tern habitat, pallid sturgeon habitat, Nebraska was still making unhappy noises about "regime of river" in its relations with Wyoming and Colorado--but negotiators had produced a winning program, a solution to problems that had vexed them for years. Victory of a sort was at hand. But victory threatened to deny time to Nebraska. Victory would force unwanted confrontation within Colorado and between Colorado and federal negotiators over division of peak flows. The contemplation of victory and its implications brought a room full of people to silence. Victory meant impasse.

PART VI REFLECTIONS AND CONCLUSIONS

CHAPTER TWENTY:
SOCIAL ORGANIZATIONS AND REQUISITES FOR SUCCESS

"Seek simplicity and distrust it."
Alfred North Whitehead

Accomplishment

Establishment of the Platte River Habitat Recovery Program is a story yet to fully unfold. Events press too closely upon today's perspective. Important matters have been omitted, some for lack of space, some await clarification that best arrives with completion of negotiations. But, a point in the journey has been reached where it is possible to ask in a preliminary way: what can be learned?

Concepts that have organized the central question of this work were defined and justified in Chapter One. Employing two dimensions of benefit streams (rivalness and excludability) three types of property were identified:

1. private property/goods the benefits of which can be captured by investors and denied to non-investors.

2. collective or public property/goods, the benefits of which cannot be captured by investors to any greater extent than non-investors.

3. common property/goods, benefits of which cannot mostly be captured by investors and costs of excluding "free riders" are high.

Translated into these terms the story of the Platte River Recovery Program is one of:

1. mobilizing producers of private goods (e.g., agriculturalists, private well owners) and organizations designed to provide common property resources (e.g., water under control in an irrigation or urban supply systems such as mutual companies, irrigation districts, conservancy districts, municipal water suppliers, electricity producers) and environmental organizations (currently Audubon, National Wildlife Federation, and the Whooping Crane Trust–in the earlier going Environmental Defense) that had been working on behalf of smaller scale collective goods by way of improved bird habitat.

2. to produce a large landscape scale collective good by way re-regulating an annual average of 130-140,000 acre feet of Platte basin water, by acquiring 10,000 acres of terrestrial habitat in the first program increment, and by providing a coherent and scientifically defensible program of monitoring and research that will be capable of determining whether or not worthwhile things will be accomplished, and by feeding new knowledge into the adaptive management decision making

process.

Environmental benefit streams may be significant and important to the future of society, but they do not produce wealth to be captured by individual investors, nor can their contributions to the good life be denied to those who have not paid for them. Therefore, the problem is how to mobilize resource users to invest in a collective good for society–e.g., improved wildlife habitat--the benefits of which can be captured to no greater extent by investors than by non-investors.

In all societies collective goods have been seen as essential to the enjoyment of private goods. Roads are necessary to the use of automobiles. The Federal Communications Commission regulates the airwaves so that individual people and organizations can employ market exchange to build, distribute, and enjoy radios, television, and telephones. We have been recently reminded of the importance of the Security and Exchange Commission and its role in keeping private accounting practices up to standard such that the stock markets can properly function to allocate investment capital in the private goods sector. National defense has always been a top priority collective good–perfectly non-rival and non-excludable–to keep the enemy from the gates while those within enjoy their private goods. Societies have always depended upon provision of high quality collective goods.

We have only begun, however, to learn about how to provide large-scale environmental collective goods when ecosystems are not in public ownership and confined to designated boundaries of public parks and forests. On the one hand, we all know that we are dependent upon complex biotic webs that provide countless ecosystem services unpriced by any market. Viable riverine habitats are the best and cheapest way to provide elaborate arrays of services ranging from flood control to the recycling of waste, from cleansing air and water to sustenance of high quality aesthetics. On the other hand, the careless pursuit of cheapest possible private goods consumption, and the organization of our common property water resources for getting water flows to private fields and household taps in ways too often blind to environmental consequence, has led us to degrade environments generally and our rivers particularly. Our private goods consumption must incorporate something more of the actual costs of production, costs that have been typically imposed on other living things. The ESA, at its core, held forth a policy promise that we must, in a limited way, constrain our willingness to take out unpriced mortgages against mother nature and future generations.

What the language of the Endangered Species Act, however, did not do was to specify a blueprint for its implementation. How were private and common property goods producers to actually be mobilized to provide a whole new set of collective goods in the form of habitat restoration? Taken to the Platte, how is the DOI supposed to induce people and organizations to sustain interest in restoration of species habitat when: a) the benefits can never be captured by those who pay the costs; and b) non-investors will enjoy the benefits just as much as the investors? Insofar as the Platte River Recovery Program negotiations can point to some answers, they become important to document and examine.

The Platte River Recovery Program process, along with other attempts by the Department of the Interior to initiate large scale federal-state collaborative habitat restoration efforts, has been a testing ground for working out methods for undertaking a civic process that can mobilize

resource appropriators to transcend their long-standing agendas while still serving them. Basic elements of the formula include initial listing of species, identifying sources of jeopardy to the species and their habitats, designating critical habitat, defining the legal and administrative nexus where required federal permits are conditionally available, negotiate a path to the framing of a cooperative agreement which will eventually lead to a proposed program that can, if it passes muster, serve as a reasonable and prudent alternative to modifying or, in the extreme, shutting down the activities that were found to have caused jeopardy.

Authorities negotiate specific milestones, timely fulfillment of which temporarily keep resource users in good stead, and recognize the limits of today's knowledge by building in the concept of adaptive management. The quest for regulatory certainty, is of course, the driving force for resource users. While listening to successive barrages of complaint, DOI leaders patiently cajole and point out the necessity of individually constructed reasonable and prudent alternatives if stakeholders should step away from pursuit of a collective solution. Such individual action is virtually always going to be the most expensive, technically challenging, and time consuming option. Collective action on behalf of a given environmental outcome, organized by the full assembly of user organizations, can virtually always be expected to be the preferred course when viewed from a basin-wide perspective, or at least it will become the "lesser of evils" if viewed from the perspective of any given resource appropriator.

Application of the basic DOI formula has actually worked on the Platte, or at least it has worked up to the point of putting into place essential program components. Although tough issues are now being confronted--such as those having to do with allocation of peak flows as between state and federal agendas, and regime of river as between Nebraska on the one hand and Wyoming and Colorado on the other--the general framework of a viable habitat recovery program has been constructed. In about one decade, representatives of three states, water users and environmental interests, and three federal agencies none of which have had a history of mutually supportive warm relationships, put together a major program of land, water, and research that–whatever its inadequacies–represent a major departure in basin water planning and management. Putting an environmental agenda on the dockets of Platte basin utilitarian management has been no small accomplishment. The process has had its tedious and antagonistic moments. It has been time consuming and expensive if measured against costs of many other environmental programs of lesser scale and challenge. It has been incredibly speedy and cheap compared to what the nation has been prepared to spend on modest and failed weapons projects. But the promise of relief from jeopardy and regulatory certainty that comes by plodding fulfillment of milestones has worked. It has worked a bit fast for Nebraska, arguably somewhat too slowly for Colorado, but the process has produced a viable alternative that can potentially serve the river, all who live on it, visit it, or from great distances just know that quality habitat exists not only for the listed umbrella species but for all those life forms beneath that serve us in ways that we may never know.

Reflections

Given that the process has worked to produce a substantial portion of a proposed viable reasonable and prudent alternative, what might be said about it? Several factors are advanced here for discussion (See Figure 12).

Crisis

Crisis has always meant the presence of great trouble that requires mobilization for new kinds of action, the reconfiguration of existing ways. Crisis is what the ESA imposes upon routine agendas of organizations that fall within its grasp. Representatives who came to the table to negotiate the proposed recovery program were all part-timers, people who had many other things to do to take care of the regular organizational mission. It was only after the ESA induced crisis credibly threatened to block achievement of organizational objectives that leaders reluctantly made some time available to attend to matters. They sat at the table because the ESA had created a big problem that would not go away until a collective solution could be negotiated. It is obvious, but worth noting, that if the ESA induced crisis had been relaxed or removed, resource user representatives would have immediately, and quite understandably, disappeared. Who in their right mind wants to spend time, money, and energy chasing after objectives, the payoffs of which cannot be captured?

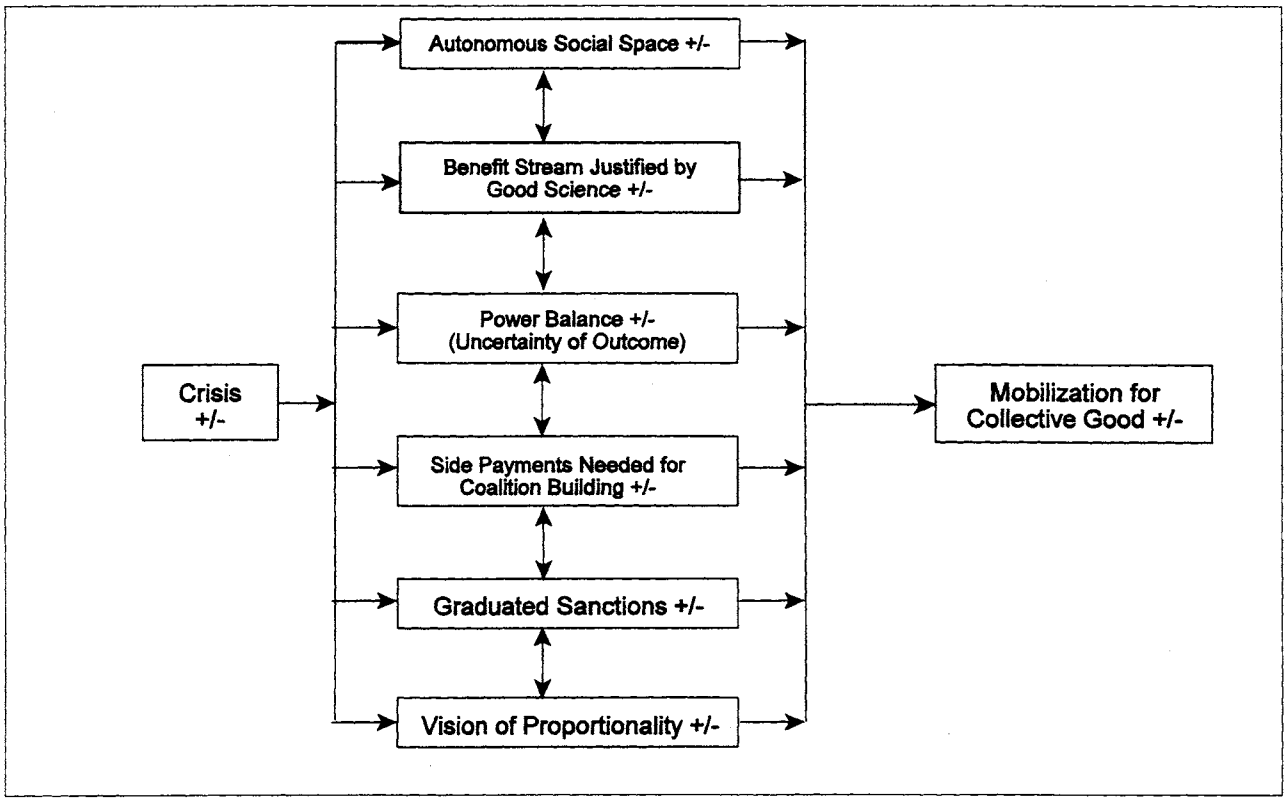

Figure 12 Variables of Mobilization for the Production of a Collective Good

The ESA has often been referred to as the "great convener" and that it is. But the legislation's capacity to convene is driven by imposition of crisis. When water users along the Platte reduce the effective yield of their projects, and decrease their margins for drought protection, in order to serve bird habitat they and their customers will bear costs with no hope of capturing the rewards beyond those available to any non-investor. The ESA must be strong and unyielding such that resource appropriators who serve all of us get the message: negotiate or cease operations. Or, as one negotiator, reflecting on what it took to keep states and water users at the

table, put it: negotiate in good faith or die! There are, arguably, many things that can be done to improve the ESA, but any change that significantly reduces its crisis making potential is to be resisted unless one wishes to argue that a good society needs little by way of large-scale environmental collective goods.

The demands of the ESA also produce political cover for those political leaders who wish to make use of it. They can authentically carry on a struggle on behalf of their resource appropriators, earn their political capital by so doing, and then reluctantly succumb to the necessity of supporting a proposed program as the lesser of evils. The new collective good will then produce a benefit stream that becomes the fountainhead for new opportunities to produce and exchange things in the sectors of private goods and common property resources--e.g., tourism around birds in Nebraska; well regulations that will protect surface water rights. Such things, in turn, generate new constituencies of beneficiaries supportive of the collective good that made the private and common property benefits available. Clusters of beneficiaries, then, are available for coalition building by shrewd political leaders. Once collective goods are in place, once private goods constituencies have learned to thrive around them, that which was once damned as useless extravagance, becomes defended as important to the good life. A less demanding ESA could be expected to justify less sacrifice for collective goods, and thereby provide less of the necessary political cover to put something new in place against the initial resistence of organizations and their constituencies that will be asked to pay the costs. A more pliable ESA cannot put the new collective goods in place that will be the foundation of future private goods activities and new constituencies that will one day be effective defenders of the new order of things.

What strategic threads can be pulled from the rich tapestry of the Platte river negotiations? The extent to which the ESA does effectively mobilize civic action depends heavily upon how the act is administered. Six variables are listed in the center column of Figure 12; each is viewed as intervening and conditioning the impact of an ESA induced crisis. These factors, while certainly not sufficient, are advanced as being necessary to effective civic mobilization. Small changes in these variables are posited to have large consequences. They also provide a framework for reflection upon the Platte river habitat recovery story.

Autonomous Social Organizational Space

There are those who have advocated that ESA be implemented in a strong federal agency command and control operations mode that would brook little compromise and compel compliance from those who have created jeopardy (Echeverria, 2001). The objective is to speed things up, hold to higher environmental standards, and avoid compromising away intent of the law whatever that might mean. The problem with all this, of course, is that it fails to recognize the limits of law in general and the ESA in particular. Tough legal stances cannot produce creative action on the rivers. Law schools and biology departments produce virtually no knowledge of how water is actually organized, and even if they did produce the essential competencies, federal agencies control very little water across the landscape. The kind of creative technical and organizational action that produces viable reasonable and prudent alternatives must necessarily come from people who are organized around the river, people with good local knowledge of opportunities and constraints. These are the very people who have created jeopardy in the first instance, but there is no choice but to incorporate their knowledge, energy, resources, and

sustained participation into any proposed program.

The kind of creative thinking that produced Wyoming's "three brick" plan at Pathfinder, Tamarack groundwater recharge in Colorado, or redirection of flows at Nebraska's Lost Creek or Funk lagoon can only be hammered out by people who have protected space within which to work out differences, frame and discard options, and most of all build local coalitions of support for options. Virtually all of the creative portion of option building during program negotiations were conducted, not on the floor of the Governance committee, but in safe spaces within the respective states where locals arrived at potential solutions that they vetted, and that earned at least minimal political support in the locality. Then, and only then, were such options surfaced in program advisory committees. Negotiations then become an interplay of state and federal agendas with ideas and positions moving up and down a chain of organizations ranging from Loveland, Denver Sterling, Fort Morgan, Holdredge, Kearney, Cheyenne, Casper, and Saratoga to monthly subcommittee meetings in motel conference rooms along the I-80 corridor. Governance Committee meetings dealt with the product of extended discussions that had gestated elsewhere for months if not years.

However, at least two things can be observed to go awry within the organizational chain of autonomous spaces. First, senior federal and state and local leaders tend to be heavily occupied with crowded agendas most of which have nothing to do with the program negotiations. They operate continuously on the verge of being overwhelmed by the complexities of the many tasks before them. The urgent drives out the important. The classic solution, of course, is to rely on staff. Staff, in turn, make their way by paying close attention to all the details in ways to protect their leader. Careers are not made by placing one's boss in untenable positions. Staffers, with some important exceptions, tended to dwell on the problems more than the opportunities, to parse issues finely while refraining from bold actions that would cut though thickets of deeply nuanced options. The only solution was sustained engagement of senior responsible leaders who have a vision of where they wish to go and articulate it repeatedly so that staff can push ahead within it. What comes out of autonomous organizational space at any level depends heavily on the quality and quantity of leadership that goes in. As leadership attention drifts away, processes slow as staffers slice and dice the issues in ways that will ferret any potential problems, but that do all to little to stimulate jumps of creative problem solving.

The potentials of autonomous organizational spaces to generate creative solutions also, of course, are fundamentally constrained by any lack of viable options that can galvanize effective political coalitions. The symptom here is that statements of intent become bogged down in an incessant cycle of wrangles extending up and down the organizational chain. When divisive policy proposals (e.g., on issues such as alternative habitats) emerged either from above (FWS) or below (state stakeholder group) that could not gather sufficient support, repetitive cycles of discourse tangential to problem-solving ensued. Solutions were not apparent. The draft statement was debated in a deeply divided advisory committee. Troubled statements were then returned to their place of origin where adamant people kept it alive in organizations along the river and in due time the issue again would be debated in advisory committees which, in exasperation, eventually sought guidance from the Governance Committee members of which would have been alerted to the difficulties and would then again send it back to advisory committees. Months would pass, deadlines would be unmet, compromises were again attempted but failed to win the support of a

sufficient coalition. Discourse in protected autonomous organizational spaces can be no better than members ability to frame up technically viable and politically winning proposals and that will, typically, require engagement of senior leaders.

Systematic use of workshops pulled people out of their various organizations, brought them together in seminar formats, and introduced them to essential topics–e.g., sediment-vegetation, future depletions plans, organizational options for habitat management, how each of the states tracks its water. Presentations and discussion allowed parties to advance their perspectives, to define meanings, and to better explore the implications of their own arguments and those of their adversaries. At the end of the day participants returned to their camps and maintained their loyalties. But, as they did so, they were better informed , more appreciative of other positions, and better able to imagine solutions. It took time, patience, and a willingness to appreciate multiple aspects of a common truth. Problem solving activities in autonomous organizational spaces were enhanced by infusions of reasoned thought from others in the negotiating circle and outside consultants.

Law administered by an implementing agency provides the crisis. Law insists that a remedy be found, but creative construction of reasonable and prudent alternatives must emerge out of protected autonomous organizational spaces not penetrated by federal authorities, or rivals from within or beyond state lines. In the Platte basin it was the South Platte Lower River Group (SPLRG) in Colorado, CNPPID and NPPD in Nebraska, and the North Platte and Kendrick projects in Wyoming that could sustain the essential social, technical, political discourse.

Negotiations are not simply about getting agreements forged among Governance Committee members. They are fundamentally about building social and political coalitions of organizations far beyond halls of Governance Committee deliberations, coalitions of actors who actually manage the water and wildlife habitat along the river. Using a chain of autonomous organizational spaces to build within-state–and eventually multi-state/federal--organizational coalitions that will nurture the production of the new environmental collective property is the essential requirement. When examined in this perspective, former Secretary of Interior Bruce Babbitt's collaborative strategy has worked remarkably well. Collaboration allowed discourse to flourish that produced important local buy-ins to the program. Locals are ready to go in Colorado, Wyoming, and in Nebraska's CNPPID and NPPD.

One big problem is that energized Nebraska constituents, organized within their NRD fortresses that were built to insulate them from state surface water appropriation doctrine, have been all too unreconciled to joining either of two conversations: a) what they owe to their Nebraska surface water neighbors; and b) what they owe to the natural world from which they draw their sustenance. Their ideology is that of the cancer cell–three percent growth forever! Much Nebraska autonomous organizational space is organized in ways hostile to not only to federal agendas but also to essential Nebraska agendas. In Colorado, autonomous social organizations created a workable solution only to find a Republican administration hostile to local solutions that were perceived to be ideologically inconsistent with what central state authority wanted.

Benefit Stream

There are many issues to be addressed in the analysis of benefit streams. Who wins? Who loses? Do benefits exceed costs? How are costs and benefits to be defined? Who, or what, bears the burdens of uncertainty? Two fundamental questions will be noted here. First, is the benefit stream authentic and justified by sound scientific rationale? Second, how can the program and its expected stream of benefits be packaged and "sold" to audiences beyond the negotiating rooms? Struggles to cope with both questions has been an important part of the Platte basin story.

Two strategic assumptions have provided foundations for the entire negotiating process from the first day: 1) the habitat area upon which all program activities were focused was in fact important to the listed species; and 2) that prevailing conditions of that habitat were, in fact, significantly limiting the efforts of the FWS to recover those species. Should these assumptions be seriously questioned, all rationale for negotiating and implementing program would evaporate.

In the early years, both assumptions were questioned in the informal and inadequate sense that sessions were witness to much venting of anger. But, as talks continued, water users could see the futility of "throwing their spit-wads" at FWS target flow calculations, and they began to engage in serious discussion of solutions. Moderate and pragmatic voices set aside issues of "bad" science, accepted the FWS offers of reduced target flow figures and a division of land habitat acreage requirements (i.e., only 10,000 acres in the first program increment) and got on with building a program that could deliver regulatory certainty. However, old irreconcilable interests–especially among the groundwater users of Nebraska–saw the negotiations slowly advance much to their dismay. They were able to again force the issue back to the table. They did so by employing a distorted story of a purported lynx hoax, and the all too calamitous confrontation on the Klamath. In each case, the argument went, bad science was being used by the DOI to unjustifiably hurt people. This kind of argument, in the context of Nebraska's political difficulties in putting together a winning coalition on behalf of the proposed program, led to calls for a review of the federal science that justified the Platte basin initiatives.

If people are to be mobilized to produce and sustain a collective good, the underlying rationale must be viable. If there is serious question as to whether the collective good is needed, or can fulfill its promise, there can be no effective mobilization. Production of quality species habitat in central Nebraska will require sacrifice of people's private and common property resource agendas, and those sacrifices can only be justified if there is compelling evidence that such a collective good will produce the benefits intended and that the collective good is actually important to the threatened and endangered species. A fully justified and compelling vision of the benefit stream to be produced must be central to the program effort.

A second issue has been how to do public involvement, share information, and galvanize public support for the program and its package of benefits. There are, however, severe constraints on the capacity of the negotiators to "sell" program justifications and benefits broadly among constituencies. It is one thing to have completed the necessary science to justify program construction and to mount evidence on behalf of anticipated benefits. It is quite another thing to package that science and its pay-off rationales in a manner that can build constituent support.

In the Platte River Recovery Program each major negotiating entity has been responsible for developing efforts at public outreach. This was deemed necessary because each of the partners

has different audiences requiring politically unique approaches. For example, while DOI concentrates on rolling out a draft environmental impact statement in a manner that will minimize lawsuits from environmentalist critics, states must work out messages that will appeal primarily to their water user communities, and that means emphasizing the promise of regulatory certainty. Furthermore, what is said to one user community in Nebraska must square with what is being shared with users in Wyoming and Colorado. It is all too easy to trip each other up. What appeals to the environmental community may all too easily become ammunition for groundwater users in their campaign against the program. The reverse is true; attempts by Nebraska authorities to develop a perfectly honest message that will assuage fears of its irrigators, may well offend environmentalists. A "solution" for any given entity may quickly mushroom into "problems" for others. Opponents of the program will be quick to take any carelessly constructed argument from one context to another. All of this places a severe strain upon the ability of program proponents to get their messages out.

In Nebraska, where arguably public outreach efforts to sell program benefits are most needed, Governor Johanns has yet to declare himself a supporter. His 23 member advisory board will, presumably sometime in 2004, recommend to him a position of support or opposition. In this context, how can program proponents on the Nebraska negotiating team conduct an energetic and sustained effort of public outreach on behalf of the program to the good citizens of Nebraska? They cannot. To do much more than assert program merits and pitfalls when asked risks preempting the Governor's decision. Nebraska provides a case where the team that has spent years putting together a potentially winning program cannot publically and aggressively assert the merits of that program in an environment thirsty for facts, information, analysis, and interpretation. In a social and political configuration such as Nebraska's, the more the political jeopardy, the less negotiators have been able to be a public resource for careful civil program advocacy.

In Colorado, the internal struggle between South Platte water users who have put together the state's contribution, and the Owens administration which came to office well after signing of the 1997 Cooperative Agreement, precludes any systematic public outreach. However, in the Colorado case, the absence of public outreach is not critical to the final decision, because essential water players are already on-board. Nevertheless, it is disturbing to many observers of the scene that--after years of negotiations--neither Nebraska or Colorado are in a position to take a strong public stand in behalf of the proposed program. In the final months leading up to the definitive moment in 2004, there are no strong public champions of the proposed program's benefits on the street.

Problems of making a public case for program benefits are political in another sense. Information and data themselves are easily politicized. Prudent program builders become reluctant to share details in ways that are not carefully considered. For example, when program particulars are assembled in the EIS team's environmental impact statement–the first official document that most on-lookers will ever see–the writers will have worked at the level of general concepts illustrated by possibilities. The analysis of the program at this pre-implementation stage can only work with central tendencies, not site-specific certainties. A given table may display possible–not actual–impacts of, say, river channel widening efforts. The thought of a particular channel stretch going from 700 feet to over 1000 feet in width, could be more than a little

unsettling for those who live there and own it. The particular combination of manipulations on that particular portion of the river may never happen under the program, but many citizens–especially those close to the example–know they are looking at an official publication. Furthermore, it is easy for such readers–with their detailed knowledge of their site-specific circumstances--to imagine possibilities never intended by the document writing team scribbling away far from the river. All too quickly, then, constituents fearing the worst may become estranged from the proposed program for reasons that would never come to pass. Sharing data and information is not a politically neutral activity and must be accomplished with circumspection and a politically astute eye.

In sum, program proponents faced two challenging problems regarding the expected benefit stream. The "junk science" issue allowed opponents to seriously question the necessity of producing improved species habitat, and there have been serious constraints upon ability of the players to get the word out about the nature of the benefits to be produced and means selected to do so. The schedule had induced a rush toward the original June 30, 2003, deadline (now being extended on a month-to-month basis but likely to be further extended to June 30, 2005). Yet, there has been no way to mount any systematic public outreach in any state. There will not even be any publically proposed program description available for widespread public scrutiny.

Viable benefit streams must be envisioned and justified. Benefit streams of collective action must be packaged in ways that induce the most thoughtful consideration among citizens who have never been close to negotiations. The Platte river negotiations have encountered serious challenges in both respects.

Power Balance

Negotiations were sustained by virtue of the fact that neither the states nor the Department of Interior (FWS) could compel the other to do its bidding. Federal positions on issues such as target flows, riverine vs. alternative habitats, and sedimentation-vegetation each in their on way drove at least some within states toward serious consideration of seeking redress through court action and abandonment of negotiations. Yet, in each instance, voices calling for such strategies were eventually quieted by those who pointed out the uncertainties of possible outcomes, high costs of any defeat, by the expense of such actions in time and money. In each instance, prudence dictated staying at the table.

For its part, the FWS was well aware of movements in Congress–most especially the House Resources Committee--to "reform" the Endangered Species Act in ways that would weaken the agency's capacity to implement the ESA. Collaborative negotiations–reasoned, flexible, patient, backed by the horrible prospect of individual accountability for constructions of reasonable and prudent alternatives as required by Section 7-- pointed the way to solutions, and denied ammunition to those who sought to attack federal environmental agendas. Most of all, the FWS controls virtually no water. If water is to be re-regulated for habitat, the agency has little alternative but to work with those organizations within the states that do control it. The FWS has a powerful legal mandate, but it is the states under the constitution that have the water.

If one were to see the balance of power shift sharply to one side or another, it is reasonable

to speculate that the organizational chains that provide essential autonomous space for creative action would not be called upon to devise new environmental collective goods. If the federal agencies were to win the tug-of-war, they–pushed by environmentalist constituencies--could be expected to ignore or drive away the multiple tiers of water user organizations that have essential river knowledge. If the states were to prevail, it seems quite clear that they would largely abandon the quest for new environmental collective goods and would, thereby, let traditional water uses and practices stand at the expense of habitat recovery. The extant balance of power has been instrumental in making things work–insofar as they have worked. Given the limits of their respective positions, each side needs the other as collaborator. If the day should arrive when one side becomes sufficiently dominant that it does not need the other, creative problem solving in the production of environmental collective goods will falter.

Side Payments

Platte basin negotiations clearly demonstrate the importance of making arrangements among coalition partners to compensate needed allies for their cooperation and assistance. In such cases, the promise of regulatory certainty was not enough to induce participation of the essential ally, or even if the ally was in the nexus but needed more inducement, side-payments by some coalition partners to others strengthened bonds of cooperation and smoothed collaboration.

In Colorado, water users along the front range from Denver to Fort Collins were clearly in the federal nexus and needed to comply with ESA mandates. Yet, the logic of Colorado's situation made it imperative that front range users work out their basin recovery program contribution far downstream close to the Nebraska border. The problem was, it will be recalled, that lower river users were not in any immediately compelling federal nexus. They had no incentive to cooperate. In order to induce lower river cooperation, front range users assisted their downstream partners-to-be with their well augmentation needs. Expanded well augmentation was needed by lower river groundwater users for reasons stipulated by both Colorado law and the Colorado-Nebraska compact. Junior well owners below the Balzac gauge had to protect Colorado senior surface right holders and Nebraska's compact entitlement at the border, or shut off wells in high demand moments just when those wells were most needed. Assistance with additional well augmentation was a form of welcome side-payment that was to come from private lands recharge that came along as part of the Tamarack Plan. All this was essential to the creation of the South Platte Lower River Group (SPLRG), a coalition that could support the Tamarack groundwater recharge project as the centerpiece of Colorado's contribution to the basin-wide habitat recovery program.

In Wyoming, side payments were an important part of the state's alliance with its irrigation districts drawing water from the North Platte. The districts were in the federal nexus and, in any circumstance, would have to undertake the long quest for regulatory certainty. Here, however, the state found it advantageous to quiet opposition and smooth relationships by working out ways to address district issues regarding toxic selenium concentrations in selected places, and dam safety issues. Promise of these side-payments have kept Wyoming's internal discourse much more constructive and positive than may have otherwise been the case.

Nebraska has the support of its two big districts CNPPID/NPPD) that require federal

permits for operations of Kingsley Dam and Lake McConaughy. They needed regulatory certainty, and have already paid the considerable costs of complying with FWS/FERC requirements. Nebraska's biggest political problem has been to defuse strident opposition from groundwater users, most especially beyond the boundaries of CNPPID. These well owners are numerically in the majority by a handsome margin and have been mobilized for years to insure Nebraska state authorities do not require them to do what Colorado did in 1969–i.e., integrate their junior wells into Nebraska prior appropriation doctrine. They have fought ferociously to avoid having to subordinate their right to withdraw groundwater to senior surface water priorities. They have gone so far as to insure that the state does not directly regulate groundwater wells, a function performed by each Natural Resource District. So Nebraska has two problems that a majority of the groundwater users are deeply invested in denying: 1) the problem of protecting Nebraska surface canal community senior priorities from the depredations of Nebraska junior well depletions; and 2) the problem of constraining groundwater depletions such that the three-states-DOI program flows can actually get to the designated habitats in proper measure.

What can be done? Nebraska authorities have offered a side-payment to the groundwater users. It was politically impossible to impose a top-down program of well birth control and regulation of pre-existing pumping. What could be done, however, was to provide a program of state provided offset water for all wells installed and registered up to December 31, 2003. In effect groundwater users were told that they could install as many wells as they wished up to that grace period termination date, and the state would use its treasury funds to create the means to repay the river for groundwater depletions. Projects would operate on the same general principle that underlays the habitat recovery program–i.e., divert peaks of high flows and re-regulate them to the river when needed for Nebraska senior users and the critical habitat. In return, groundwater users were asked to drop their opposition to the Nebraska's participation in the basin habitat recovery program.

The state decision to provide offset water for any wells put in the six and one half year period between mid-1997 and January 1, 2004 was generous by any measure. It represented a standing invitation for anyone with the means to capture additional private benefits while imposing the costs on the commonwealth. But many observers worried that it was not sufficient to placate those who have little interest in tempering their private goods rationality with any collective responsibility. Feeling the heat from groundwater users, and in the context of severe drought that placed a premium on further drilling, Nebraska state authorities, in mid-August, 2002, announced a revised plan for water depletions post-July 1, 1997 that: a) promised to provide equity as between groundwater and surface water users, by state provision of offset water for new extraction projects of either type until December 31, 2003; b) asserted that new depletions as of January 1, 2004 and later would have to be compensated by the project builder; and c) to the extent that post-2003 NRD/user offsets were not sufficient, the state of Nebraska would provide the necessary supplemental offset water to the river in amounts, at times, and at locations needed. Nebraska had committed itself to the ultimate side-payment to get water users–especially groundwater users–to drop their hostility. They were handed a ticket to perpetual water exploitation the costs of which would be socialized to the central treasury! Desperate times had called for desperate measures.

Two large problems have emerged with Nebraska's rapidly ballooning side-payment.

First, what once looked like a modest proposition for three years in an expanding economy that had swelled state coffers with surpluses, now appears to be a possible "budget-buster." As Nebraskans race to install wells and thereby increase the eventual negative impacts, treasury revenues have dwindled in a time of economic contraction. The escalating cost of this side-payment may, in the near future, be used against the very programs (Nebraskan senior/juniors, and federal-state) that it was designed to serve. Secondly, the nature of the side-payment forestalls the kind of discussion that Nebraskans must have about their water obligations to each other. Nebraska water authorities know well that their state must enact meaningful law that will integrate groundwater uses into state appropriation doctrine that governs surface diversions. That discussion will now be postponed and Nebraska taxpayers be subjected to an open-ended bill to be continuously submitted by water users who resist any form of well birth control and any sense of collective responsibility to the river and all the varied benefits that the river confers such as wildlife habitat.

However, there is obvious good news. The state commitment to offset new depletions on behalf of the species habitat recovery program does cleanly separate two challenging discussions: 1) the consideration of what groundwater users owe their canal water user neighbors; and 2) what must be done to serve the Platte basin habitat recovery program. Providing Nebraska water users with offset water can be expected to help clear away opposition to the habitat recovery program, and permit the governor to sign off. Then, at a later date it may be possible to take up the vexed agenda of Nebraska groundwater law after having divorced it from the federal habitat agenda. Nebraska authorities have played their ultimate–and potentially expensive--trump card to buy-off groundwater user opposition. Once again, the West is witness to a resource extraction group using its political leverage to maintain its right to pursue private advantage while compelling the public treasury to pick up the costs that have been imposed on the wider community of people and other living things.

Whatever the outcome of basin negotiations, it is certain that the structuring of side-payments has been important to the political coalition building that sustains any hope of a viable program. Students of large scale collaborative habitat improvement programs would do well to examine the uses and limits of alternative ways of organizing side-payments. It is worth noting that much of the business of negotiating a successful program had to take place in safe autonomous organizational spaces (see above), and was very much about how to secure support, and diminish opposition, by building local site-specific side-payments. No top-down command-and-control approach to ESA implementation geared to saving time by over-riding local interests could ever hope to construct the elaborate system of exchange that goes into a program sustaining coalition. In a world wherein serious environmental action requires careful construction of large scale collective goods that, by definition, can offer no meaningful reward to investors other than that which can be available to any non-investor, side payments will always be an essential part of program negotiations and sustainable success. The question becomes: what forms of side-payments embody defensible transfers of welfare and are, thereby, justifiable?

Graduated Sanctions

A common complaint has been that the negotiations have drug on too long. Water users have, at times, approached the talks with the enthusiasm of seventh graders being hauled to

detention. Stalling has been more than just a temptation. Federal agencies, for their part, have been accused of taking excessive time to produce critical reports. Why, some ask, did the Fish and Wildlife service drag out the discussions by introducing a long standing issue–sedimentation-vegetation–at virtually the last moment in negotiations leading up to the then December, 2000 deadline? Was it because the BOR-EIS team's model took considerable time to develop and be applied? Of course, but why was developing that model not a higher priority long before? The inability of federal agencies such as the FWS, USBR, and the Forest Service to coordinate their plans has been the stuff of legend for years. Everybody has a finger to point at someone else as the cause of undue delay.

There is, of course, the big sanction for failure of water users to perform–FWS withdrawal of regulatory certainty. That threat constitutes a "big hammer" that no one relishes the thought of using. There are at least two problems with employing it. First, it would be so devastating to actually stop negotiations and enter into individual Section 7 consultations about how each user would produce a viable reasonable and prudent alternative, that the FWS contemplates such extreme action only as a last resort. Second, everybody knows that individual Section 7 consultations are virtually as much a nightmare for the enforcing agency as for the users; it would require a level of effort on the part of the FWS–personnel, budget, and procedural innovation–that simply is not available under present circumstances. The organizational confrontations that would be involved would be nightmarish–dozens of Klamaths–that would have constituents reaching for their telephones and e-mail keyboards to contact their federal elected officials and thereby threaten the integrity of the ESA in Congress. Meanwhile, the species would languish while futile efforts were made to get people to do individually what cannot be accomplished with anything less than a coordinated collective effort. Enforcers who have to seriously hurt themselves when swinging big hammers become reluctant to use them.

Therefore, the big hammer, while essential to construction of crisis that can get people to the table, needs to be supplemented by some set of as yet unimagined graduated sanctions. These must be devised in ways that can be fitted judiciously to seriousness of non-performance, and provide incentives for good performance by federal agencies and local resource users alike. They must induce fulfillment of milestones without threatening to bring the whole house of discourse down if transgressions are found.

In the world of private property goods, buyers and sellers routinely put performance clauses in their contracts. Failure to deliver commodities or services on time are financially penalized. Failure to meet quality standards are sanctioned by having the provider re-do the work at the supplier's cost. There is direct connection between scale of problem and size of penalty. Ten dollar problems are not threatened with million dollar penalties. Healthy parent-child relationships are not built by threatening murder for the child's appearance at a dinner table with dirty hands. Yet, smaller failures to perform can cumulate into serious delays and all the problems that ride with delay.

This is not the place to propose and debate the merits of specific possible graduated sanctions and how they might be linked to particular milestones. Furthermore, no cleverly formulated set of graduated sanctions can solve the problems of political will encountered in Nebraska or Colorado that have led to the impasse briefly summarized earlier. However, it might

well be the case that a future depletions plan due from a given state or the federal community of agencies might be more promptly forthcoming if the actors were somehow on notice that delay in moving forward would cost some additional money to be contributed to the National Wildlife Foundation (in the case of a state delinquency) or a cash grant to reduce initial costs that the states had undertaken to pay but had been victim of the federal delay. How does one do the equivalent of "bonding" a federal or state agency in order to set aside assets to be tapped into for demonstrable non-performance? What procedures would have to be developed for the Governance Committee?

There are real dilemmas here. For example, supposing a graduated sanctioning regime could be installed and accepted as legitimate (say, DOI offered an increasing schedule of replacement water quantity and quality over time that would be required of water users for their old and new depletions in ESA Section 7 consultations if their efforts were not timely), the incentive may become perverse if a sub-set of permit hungry users rushed to task completion at the expense of internal state water community alliance building. Getting a program milestone completed on time by a few players may well produce a hollow victory if they, in the course of completing the task, have driven away essential partners. Delayed milestone completion may, in some circumstances, mean healthy negotiating processes are surmounting special challenges somewhere. On the other hand, if there are no meaningful graduated sanctions in place, and if there is temporary relief from jeopardy that goes with participation in a cooperative agreement, there may be lack of sufficient incentive to push ahead with all due and deliberate speed. The most efficacious use of carrots and sticks is a tricky business. Yet, a process that had negotiated some reasonable set of graduated sanctions, and tied them closely to specific milestones, and that could use them with intelligent discrimination, may be expected to move with greater deliberate speed than one providing only a stark choice between swinging the big hammer or nothing.

Vision of Proportionality

Players can be expected to resist joining in arrangements thought to be "unfair." Fairness, or the lack thereof, quickly turns on the question as to whether burdens shouldered, or costs paid, are roughly proportionate as compared to others who are asked to sacrifice. In private market exchange, fairness is easily determined by whether or not willing buyers and sellers can agree on a price. Buyers who find the asking price to be too high, simply seek alternative sellers. In the domain of common property resources such as an irrigation ditch, a "proportionate" contribution has traditionally been determined by making costs paid equal to the proportion of benefit stream received. Irrigators who take 15% of the water, pay 15% of the cost of operating the ditch collection and delivery system.

However, in the world of collective goods, things are more challenging. Costs to be shouldered can be calculated in somewhat meaningful ways, but since the benefit streams are non-rival and non-excludable, investors cannot calculate their value. Therefore there is no chance of determining proper proportions of cost to benefit. What are the true benefits of improved critical habitat to Nebraska over a given span of time–a year, a decade, a century? Nobody knows. It is clear that there are benefits to be had by way of two districts obtaining regulatory certainty, some surface water users receiving additional increments of protection from depredations of junior well owners, sustained tourism dropping dollars into local towns that otherwise would be by-passed,

and enhanced land values derived by near association with desirable open space. But how do these benefits compare with those captured by Wyoming and Colorado who also each receive regulatory certainty? There is no commensurable unit with which to capture the multiple streams of benefits, to compare who gains more or less, and permit calculations of fair share contributions. Asking the value of improved habitat is akin to asking the value of a newborn baby. Parents pay costs of child rearing in the faith that raising children is one of the great life experiences, not because they can ever hope to capture a stream of calculable benefits sufficiently profitable in the family ledger.

Fair share is, therefore, a deeply troubled concept when applied to collective goods issues. Early on in the negotiations, Colorado and Wyoming thought themselves well served by a conception of fair share largely limited to sending money to Nebraska. Water is potentially available in central Nebraska. Therefore, Nebraska's upstream neighbors thought it a good idea to simply provide money to acquire the cheapest available water supplies. Fair share would then mean each state would pay one third of the costs of re-regulating the least expensive water available (i.e., Nebraska water). Not surprisingly, such a vision of fair share was unacceptable to Nebraska. Money could not be viewed as an appropriate substitute for real wet water that could be available for Nebraskans in perpetuity. For Nebraska, fair share should be constructed in some manner more approximating an equal division into thirds of the 130-150,000 average annual target flow figure. That would obviously mean water contributions somewhere in the neighborhood of 43–50,000 acre feet from each of its two neighbors. To Wyoming and Colorado such reasoning was beyond absurd. Colorado pointed out that fair share had been determined in 1923 and was encoded in an interstate compact. Wyoming battled for its position in a lawsuit that took over 15 years. After the settlement with Wyoming, and accepting that state's contribution in the action plan, Nebraska then discussed with Colorado protection of the "regime of the South Platte river" as a price for Nebraska's participation in any program. Colorado's regulatory certainty would have to be purchased at the price of accommodating to at least some extent Nebraska's vision of proportionality.

As this is written, Nebraska's vision is being pitched against Colorado's in conversations now underway. They reflect different principles. Failure to bridge the gap will mean collapse of the collaborative effort. Those who seek explanation for failure and success of cooperative program negotiations must pay close attention to the visions of proportionality that are in play and how they will, or will not, be integrated into a definition of fair share that all parties can abide. There is no issue more critical to successful negotiation than this one.

Summary

Platte River Recovery Program negotiations have been instructive. Here, attention has been paid to seven critical variables. Are they sufficient to explain the difference between success and failure? No. Yet, there are grounds for contending that they represent strategic considerations in any attempt to understand how people can be mobilized to produce and sustain collective property in the form of improved species habitat.

Analysts are in the position of the auto mechanic asked if the car under scrutiny will make tomorrow's 500 mile trip. The mechanic can check out essential components and apparent

problems can fixed. But, after the machine has met all tests there is no guarantee that the trip will be successfully completed. Things beyond the analysis–being rear-ended at the first stop light beyond the shop's parking lot–can always account for failure. The best analysis can never therefore pretend to provide a blueprint for success, but analysis can highlight factors, fulfillment of which, will improve chances of success in a complex and theory-defying world.

What can be concluded? No matter how much money and time is to be spent, no matter how clever and creative the individual people involved, there is no chance of implementing the collaborative initiatives under the ESA if:

1. that legislation cannot create a meaningful crisis for operations of organizations whose activities have created jeopardy;
2. there is a lack of autonomous social organizational space to which resource users can retreat to work out proposals, plan their side-payments, build their coalitions; local organizations working in the interface between federal and state bureaucracies, on one hand, and individual resource users on the other hand, are essential partners in creating, implementing, and enforcing solutions;
3. the benefit stream to be produced by collective action is thought to be unneeded according to the best available science and justification for a new order of things is thereby lost;
4. the balance of power shifts preponderantly to either the regulators or the regulated such that local knowledge held within the resource user communities is:
   a. driven away by regulators who are too little constrained and feel no compulsion to incorporate the best ideas of the user communities, or
   b. local organizational know-how is not tapped because regulation is too weak to compel serious and sustained mobilization to transcend old ways and create a new revised regime;
5. side-payments cannot be devised to build and strengthen essential partnerships;
6. lack of effective graduated sanctions to spur continuous meaningful effort;
7. conflicting visions of proportionate "fair shares" in allocating burdens cannot be reconciled.

Under the conditions described above, the argument contends that implementation of collaborative habitat recovery programs will flounder. Failure to fulfill any one of the above considerations can be expected to harm, if not destroy, chances of success. It will be of interest to inquire into the experience of other collaborative programs to determine if any are judged to be successful that have not fulfilled one or more of the conditions to a considerable extent.

Conclusion

Hate it or love it, the effort to assemble a Platte river habitat recovery program reflects a fundamental shift in this nation's water history. As long as there is a compelling ESA in force, there is something new under the high plains' sun. Whenever water and electricity consumers want another bite of basin water flows, their representatives must listen, amidst the cacophony of basin voices, to the needs of three birds and one fish. One way or another there must be, as never before, a continuous multi-state basin-wide discourse about how to integrate into the human water

agenda the needs of non-human living things. Our elected representatives, three decades ago, said on our behalf that this should be so. The Platte Basin negotiations have been about learning how to do it. As they proceed, people of the basin will choose between two options as they press on into the twenty first century.

One choice will be, in the name of traditional arrangements, to reject a voluntary collaborative program for species habitat recovery. People will, thereby, chose to have their discourse via fragmented individual consultations followed by more uncoordinated attempts to offset their projects that have, or will, cause jeopardy. Beyond the technical challenges that will ride with the individual-action option, observers know well that it will likely associate also with high cost intra-state, inter-state, and federal-state litigation as permit hungry organizations vie for immediate advantage at each other's expense amidst scarcity of time, money, and water.

The second choice for the people of the basin is to forge a viable voluntary partnership that will get the habitat recovery task underway in a less expensive, more systematic manner. Either way, there will be a basin-wide multi-level discourse. The issue is not: shall we have water community accountability for listed species habitat? The issue is: how, and at what cost will people conduct the essential policy talk and implement solutions? How fragmented will be their efforts, and with what effectiveness will their attempts proceed?

Looking back, important things have been accomplished. Farmers, engineers, lawyers, economists, biologists, hydrologists, state and federal public administrators, representatives of water users organizations, environmentalists–all busy people–have pushed aside things they were actually hired to do in order to take on the new challenge. Most have been part-timers working in many instances with insufficient staff support and modest to non-existent budgets. Ten to twenty years of generally part-time work seems, in the perspective of a given career, to be a long time. When, however, the grandchildren of these negotiators look back, these past two decades will then be seen as little more than a blink of an eye. The near-miracle is that, in this time span, these few leaders have created, on behalf of their water and electricity consumers, the largest part of a potentially viable three state-federal habitat recovery program. For now, it remains to be seen whether the political will can mobilized to finish, endorse, and launch it.

APPENDIX–CHRONOLOGY

CHRONOLOGY

As extracted from Echeverria, 2001, FWS Instream Flow Recommendations: Proposed Definitions and Usage for the Platte River Recovery Implementation Program dated July 17, 2002, and other program related documents.

March 11, 1967	Listing of whooping crane as an endangered species.
1969	Passage of the National Environmental Policy Act (NEPA).
1970	Six electric utilities form a consortium to construct a coal-fired power plant and the associated Grayrocks Dam and Reservoir on a tributary of the North Platte River in Wyoming.
1973	Passage of the Endangered Species Act (ESA).
March, 1977	The National Wildlife Federation (NWF) and other groups intervene in Nebraska vs. Rural Electrification Administration, a suit challenging the Rural Electrification Administration (REA) issuance of long guarantees for the Grayrocks project, objecting that the REA had not adequately considered the projects impact on downstream habitat. The suit also challenges the U.S. Army Corps of Engineer's (Army Corps) analysis of the project.
March 1978	The Army Corps issues a Section 404 permit for the Grayrocks project, over the objection of the U.S. Fish and Wildlife Service (FWS) that additional studies are required to evaluate impacts on downstream habitat.
May 15, 1978	The FWS designates fifty-one miles of the Platte River in the Big Bend reach as "critical habitat" for the whooping crane.
October 2, 1978	The Federal District Court concludes that the REA and the Army Corps violated the National Environmental Policy Act (NEPA) and the Endangered Species Act (ESA), and invalidates both the loan guarantees and the Section 404 permit.
December 8, 1978	The FWS formally requests that the Federal Energy Commission (FERC) consult under the ESA on the application of Central Nebraska Public will expire and "will request that the Commission give prompt consideration in the relicensing proceeding to the data developed in the Platte River Study;" and if the new licenses are issued prior to expiration of the original licenses, the Districts "will implement, under the original licenses, any changes in operations designed to inure to the benefit of the Whooping Crane."

June 1, 1979	The FWS, in response to FERC's determination that the EIS would not be required on the Kingsley power plant, writes to FERC that "it appears that the critical habitat may be declining at existing flow levels. If this trend of water depletion continues, a significant portion of all of the Platte River will be lost as whooping crane use area. The entire project is a major factor in the depletion of Platte River Flows. Therefore, it is essential that FERC study the operation of the entire project and in consultation with the FWS exercise the congressionally mandated duty by requiring project Numbers 1417 and 1835 be operated to conserve the Platte River whooping crane habitat in Nebraska."
December 4, 1979	FERC requests formal consultation with the FWS under the ESA.
1980	The parties to Nebraska vs. Rural Electrification Administration reach a settlement, leading to the creation of the Platte River Whooping Crane Critical Habitat Maintenance Trust (later renamed the Platte River Whooping Crane Maintenance Trust, a.k.a. Trust).
November 13, 1980	FERC issues an order approving a settlement between the Districts and intervener NWF concerning the Kingsley hydropower application. FERC order recites that (1) the Districts, in consultation with NWF and the resource agencies, will "prepare a protocol of experimentation with respect to the daily release schedule from Kingsley Project number 1417 into the upstream portion of the designated critical habitat in order to acquire additional knowledge of the ecological system;" (2) the Districts will file relicense applications for the projects "within 18 months after publication of the final Platte River study report."
January 6, 1981	FERC issues an order amending the licenses in conformity with the approved settlement, and includes a condition in each license stating that "the Licensee shall comply with procedures that have been agreed upon in consultation with the U.S. Department of the Interior (DOI), as described in the Order Approving Settlement, issued November 13, 1980, to ensure that the project operates in a manner that would aid in conserving the Whooping Crane and its critical habitat."
March 4, 1981	The Director of the Office of Hydropower Licensing, after holding a meeting with the Districts, and without giving any prior notice to NWF or the DOI, amends the licenses to delete the condition that the projects be operated "to ensure that the project operates in a manner that would aid in conserving the Whooping Crane and its critical habitat." The FWS published "The Platte River Ecology," a report on the results of a three-year investigation of Platte River habitat in central Nebraska designed to develop guidelines for management of riverine habitat and adjacent lands.

January 20, 1983	The FWS issues a biological opinion concluding that the Bureau of Reclamation's (BOR) proposed Narrows Unit on the South Platte River in Colorado would jeopardize threatened and endangered species under the ESA.
March 25, 1983	In aftermath of the decision on the Narrows project, the FWS and the BOR agree to establish the Platte River Management Joint Study. The study divided into two phases, with phase 1 designed to develop conservation alternatives for the management of Platte River habitat that would eliminate the jeopardy determination for the Narrows Unit. The second phase is intended to address the habitat needs of nonlisted wildlife.
June 28, 1984	In accordance with Federal Power Act, Central and the Nebraska Public Power District (NPPD)(the Districts) submit their initial relicense applications to FERC
November 1984	Water development interests in Colorado, Nebraska and Wyoming successfully petition the Secretary of the Interior to establish a joint State/Federal Platte River Coordinating Committee to oversee the Platte River Management Joint Study.
December 7, 1984	FERC informs the Districts that their applications are deficient and that they have ninety days to amend them. Deficiencies include inadequate analysis of the long-term impacts of the projects' operations on vegetation and wildlife, a lack of studies regarding the feasibility of operating alternatives, and a lack of proposed mitigation measures that would minimize the environmental impacts of the projects.
March 6, 1985	The Districts request an extension to correct deficiencies in their applications until 120 after completion of the Platte River Management Joint Study.
May 28, 1985	Interior least tern is listed as a threatened species.
December 11, 1985	Piping plover listed as a threatened species.
January 27, 1986	FERC grants the Districts until 120 days after completion of the Platte River Management Joint Study, which was then scheduled to be completed in Spring 1987, to correct the deficiencies.
January 20, 1987	The U.S. Supreme Court in Nebraska vs. Wyoming reopens this long-dormant interstate case in the Court's original jurisdiction by allowing Nebraska to file a petition to enforce the decree for injunctive relief.

April 20, 1987	The U.S. Supreme Court in Nebraska vs. Wyoming issues an order granting Wyoming leave to file a counterclaim alleging that Nebraska has violated the decree in various respects.
May 22, 1987	The Trust files a petition with FERC requesting that interim conditions be imposed on any annual licenses issued to Central and NPPD in order to protect the Platte River habitat of the whooping crane and other endangered and threatened bird species.
May 28, 1987	The FWS requests FERC to formally consult under the ESA prior to issuing annual licenses for the projects.
June 30 & July 29, 1987	The original licenses for Central's and NPPD's licenses expire. FERC issues the first of twelve "annual licenses" for the projects, which essentially continue the terms of the original licenses issued in 1937.
July 24, 1987	FERC rejects the FWS's request for consultation on the annual licenses, on the ground that the Commission lacks the legal authority to modify the terms of the original licenses issued in 1937.
September 30, 1987	Intervener American Rivers, Inc. and the Sierra Club file a petition for an order establishing expeditious procedures for relicensing in accordance with the Electric Consumer Protection Act of 1986.
March 7, 1988	The Supreme Court in Nebraska vs. Wyoming denies Nebraska's motion to modify the 1945 decree to require Wyoming and Colorado to share the burden of providing instream flows necessary to preserve wildlife habitat.
May 5, 1988	FERC grants the environmental groups' petition for expeditious relicensing proceedings and directs that corrected license applications be filed within two years. The FERC order states, "it is no longer appropriate to tie the correction of the deficiencies in the relicense application to the (Platte River Management) Joint Study."
May 19, 1989	The U.S. Court of Appeals, in response to a petition for review filed by the Trust challenging the FERC's denial of the Trust's May 1987 petition, concludes that FERC erred in ruling that it lacked the legal authority to formulate interim terms and conditions and that its failure to do so under the facts of this case was arbitrary and capricious.
June 6 & August 21, 1989	The Trust and environmental interveners file petitions with the FERC, urging the commission to impose interim terms and conditions on the projects to protect wildlife and wildlife habitat.

September 18, 1989	Districts make a filing with FERC stating that there is no need for interim conditions because irreversible damage has not occurred.
February 14, 1990	FERC issues an order determining that irreversible environmental damage would occur pending relicensing of the projects unless interim conditions are imposed. FERC orders NPPD to make instream flow releases to benefit the habitat in central Nebraska, to construct tern/plover nesting islands, and to conduct monitoring studies. Believing that it lacks the authority to unilaterally impose the same conditions on Central, FERC urges Central to cooperate with NPPD in meeting the terms of the order.
April 17, 1990	FERC, in response to objections raised by NPPD, issues an order lowering the interim instream flow release requirements.
May 4, 1990	The Districts file a "joint response" to FERC's various deficiency notices, effectively completing the application process.
May 8, 1990	NPPD files with FERC a motion for a stay of the February 1990 order, stating that Central refuses to cooperate in providing water for instream releases.
May 31, 1990	FERC issues an order staying the instream flow release requirements of the February order, contending that the Commission lacks the authority to direct Central to cooperate.
June 19, 1990	FERC notifies the Districts that their license applications are accepted for filing.
August 17, 1990	FERC issues a notice of intention to prepare an Environmental Impact Statement (EIS) pursuant to the NEPA and to conduct public scooping meetings for the relicensing of the Central and NPPD projects.
August 17, 1990	Pallid sturgeon listed as an endangered species.
November 20, 1990	The Trust and the conservation interveners file comments with FERC and provide recommendations for terms and conditions to be included in the licenses for the projects.
January, 1990	FERC issues a scooping document for the planned EIS.
July 16, 1991	FERC, in response to an application filed by Central, issues an order amending Central's annual license to include modest conditions to address wildlife issues pending relicensing.
January 20, 1992	Central files a "Comprehensive Relicensing Plan" for its project

January 22, 1992	FERC releases its Draft Environmental Impact Statement (DEIS) for public comment in the relicensing proceedings.
April 17, 1992	The U.S. Court of Appeals, in response to a petition for review filed by the Trust, concludes that the Commission has acted lawfully in staying its order imposing interim instream flow requirements. The court also rejects the Districts' challenge to the interim conditions not stayed by FERC. The Court states it is "a mystery to us" why the parties are "so hotly contesting" the interim conditions given that, "according to the Commission, new long-term licenses could issue in one and one-half years." (FERC did not actually issue new licenses for another six years).
July 22, 1992	FERC issues a notice of its intention to prepare a revised DEIS, partly in response to the relicensing plan submitted by Central and an offer of settlement filed by NPPD.
April 20, 1993	The U.S. Supreme Court in Nebraska v. Wyoming issues a decision overruling various exceptions to the Special Master's second interim report. The Court rules, among other things, that Nebraska is not entitled to a definitive apportionment of "excess waters" that flow into the North Platte River in Wyoming.
May 17, 1993	Platte River Management Joint Study Team releases its report envisioning elements of a possible Platte River Habitat Conservation Program.
Early 1994	FWS identifies need for a workshop to develop instream flow recommendations for the central Platte river.
April, 1994	FERC issues a revised DEIS in the Central/NPPD relicensing proceedings.
May 23, 1994	Instream Flow Recommendations for the Central Platte River is prepared by David Bowman, USFWS, presenting the results of a workshop held March 8-10, 1994, at the National Ecological Research Center of the National Biological Survey in Fort Collins, Colorado.
June, 1994	The FWS issues biological opinions for a series of reservoirs undergoing re-permitting on National Forest Service lands in Colorado. The opinions conclude that unless the impacts of these projects are successfully mitigated their operations will cause "jeopardy" to downstream wildlife interests.
June 2, 1994	The Secretary of the Interior and the Governors of Colorado, Nebraska, and Wyoming enter into a Memorandum of Agreement (MOA)

	initiating the development of a basin-wide program for endangered species protection and water management throughout the Platte River Basin. The agreement has a term of one year.
June 2, 1994	FWS estimates an average of 417,000 AF/year of historic instream flow shortages relative to the Service's instream flow recommendations (document dated October 17, 1994).
August 3, 1994	A memorandum entitled Pulse Flow Requirements For the Central River prepared by David Bowman and Dave Carlson, FWS. It presented results of the workshop held May 16-20, 1994, at the Mid-Continental Ecological Science Center of the National Biological Survey, Fort Collins, Colorado.
March 15, 1995	U.S. Department of Interior, on behalf of all parties, issues 15 page memorandum that stated rationale for DOI's position and briefly outlined key program elements to be negotiated. It came to be known informally as the "sideboards" agreement.
May 15, 1995	Environmental interveners file comments with FERC of the MOA process and urge prompt issuance of long-term licenses without waiting for the completion of speculative MOA negotiations.
May 30, 1995	The U.S. Supreme Court in Nebraska vs. Wyoming issues a decision overruling various exceptions to the Special Master's third interim report. The Court rules, among other things, that Nebraska is entitled to present proof of injury to wildlife and wildlife habitat in order to support its claim for injunctive relief against further development of the North Platte in Wyoming.
February 8, 1996	The Trust files with FERC a motion requesting "immediate issuance" of long-term licenses with appropriate environmental conditions.
February 8, 1996	Jon Altenhofen (Northern Colorado Water Conservancy District) proposes a method for "more specifically quantifying the duration, magnitude, and frequency" of the USFWS instream flow recommendations for the May-June period (memo to the Platte River Technical Group, March 4, 1996).
February 14, 1996	FERC releases its Biological Assessment on the relicensing applications under the ESA and requests the initiation of formal consultations with the FWS under section 7 of the ESA.
March 8, 1996	The FWS files a letter with FERC stating that additional information necessary for consultation is not included in the Biological Assessment

	and requesting additional economic data from FERC.
March 13, 1996	The Trust files a letter with FERC outlining problems with the proposed MOA, including the lack of agreement on providing flows for wildlife, and objections to the continuing delays in the relicensing proceedings during the MOA negotiations.
July 25, 1996	The Trust and the National Audubon Society file a letter with FERC expressing concern about further delays in the relicensing and requesting that the proceedings be concluded without additional delay.
September 4, 1996	DOI requests an extension to complete its draft Biological Opinion until November 15, 1996.
September 11, 1996	The Trust and the National Audubon Society send a letter to FERC expressing opposition to Interior's request for a further extension and arguing that FERC would be violating its mandate to expeditiously complete the processing of the District's applications by granting the request.
September 20, 1996	FERC grants DOI's request for a seventy-day extension to complete its draft Biological Opinion.
December 4, 1996	DOI issues its draft Biological Opinion on the proposed relicensing of the projects for FERC.
January 15, 1997	The Trust, Audubon, and other conservation interveners submit comprehensive comments on the Draft Biological Opinion arguing that the FWS's proposed reasonable and prudent alternative does not satisfy the requirements of the ESA.
July 1, 1997	The Secretary of the Interior and the Governors of Colorado, Nebraska, and Wyoming enter into a "Cooperative Agreement for Platte River Research and Other Efforts Relating to Endangered Species Habitats Along the Central Platte River, Nebraska" (Cooperative Agreement). The primary purpose of the agreement is to develop a basin-wide Platte River program designed to "(1) secure defined benefits for the target species and their associated habitats to assist in their conservation and recovery through a basin-wide cooperative approach that can be agreed to by the three states and the Department of the Interior," and (2) serve as the reasonable and prudent alternative to offset the effects of existing and new water related activities in the Platte River Basin that, in the absence of such a program, would be found by the FWS to be likely to jeopardize the continued existence of the target species or adversely modify designated critical habitat." The agreement has a term of three

	years, and may be extended "for six months" if "required to complete NEPA or ESA review."
July 24, 1997	The FWS issues its final Biological Opinion based on the Cooperative Agreement and the proposed Environmental Account in Lake McConaughy.
January 15, 1998	The Districts and the other major parties to the relicensing proceedings file an agreement on "all issues" with FERC.
May 15, 1998	The parties file their "Offer of Settlement" with FERC.
June 8, 1998	The Trust files comments generally supporting the Offer of Settlement but requesting several changes, all of which FERC rejects.
July 24, 1998	FERC issues a final EIS on the relicensing applications based on the terms of the cooperative agreement.
July 29, 1998	FERC issues an order approving new forty-year licenses for the Central and NPPD projects.
May 10, 2000	On the eve of trial in Nebraska vs. Wyoming, the parties arrive at an agreement in principle to settle the entire litigation, without specifically addressing wildlife and wildlife habitat conservation issues.
May 10, 2000	The Governance Committee agreed to extend the Cooperative Agreement for an additional two and one half years, until June 30, 2003, with the understanding that the committee may extend the Cooperative Agreement for an additional six months. This decision was driven primarily by a preliminary analysis of the sedimentation-vegetation problem.
August 3, 2000	The FWS informed the Governance Committee that the proposed program as presently configured could not serve as a reasonable and prudent alternative. Sedimentation-vegetation and other issues would have to be addressed.
September 14, 2000	Boyle Engineering Corporation delivers its report, Reconnaissance-Level Water Action Plan to the Governance Committee. It defined possible water re-regulation projects in the three basin states that could, potentially, produce an annual average of 130-140,000 acre feet for recovery program purposes.
October 1, 2000	The U.S. Bureau of Reclamation (Murphy and Randle) release a draft report ("Platte River Channel: History and Restoration") that describes anticipated continued erosion of medium-sized sand and channel

	narrowing downstream from Grand Island, Nebraska over the next several decades without changes in management of the river, and recommends short-duration vegetation scouring flows as one component of a strategy to "restore a small but significant portion" of the historic Platte River channel.
July, 2002	USFWS provides a draft memorandum to the Water Management Committee summarizing all service instream flow recommendations, and defining the conceptual categories of "species flows", "annual pulse flows", and "peak flows." This was followed by a revised draft dated December 23, 2002.
July 17, 2002	FWS announced that the USBR/EIS team found that the revised program that incorporated sedimentation and vegetation manipulations could serve as a reasonable and prudent alternative. Other issues remained to be discussed–e.g., pallid sturgeon, some modifications needed for piping plover and least tern habitat, the division of peak flows as between Colorado and the USFWS, and regime of river issues as between Colorado and Nebraska.
September 11, 2002	Designation of critical habitat for the threatened piping plover.
January 31, 2003	Contract signed between DOI and National Academy of Sciences (NAS) for a NAS review of selected aspects of the science undergirding the proposed program. Draft report scheduled for release January, 2004.
January 1, 2005	Projected date for execution of program agreement to be followed by legislative approval of funding, January- June, 2005.

REFERENCES

Abell, Robin A., David M. Olson, Eric Dinerstein, Patrick T. Hurley, and et al. 2000. *Freshwater Ecoregions of North America: A Conservation Assessment.* Washington, DC: Island Press.

Agreement, Cooperative. 1997. "Cooperative Agreement for Platte River Research and Other Efforts Relating to Endangered Species Habitats Along the Central Platte River, Nebraska."

Aiken, J. David. 1980. "Nebraska Ground Water Law and Administration." *Nebraska Law Review* 59:917-1000.

Allen, R. P. 1952. "The Whooping Crane." National Audubon Society, New York: NY.

Anderson, Stanley. 1998. "The Evolution of the Endangered Species Act." Pp. 8-24 in *Private Property and the Endangered Species Act*, edited by J. Shogren. Austin: University of Texas Press.

Andrews, Richard. 1999. *Managing the Environment, Managing Ourselves: A History of American Environmental Policy.* New Haven: Yale University Press.

Baden, John and Douglas Noonan. 1998. *Managing the Commons*, Edited by J. Baden and D. Noonan. Bloomington: University of Indiana Press.

Bean, Michael. 1999. "Endangered Species, Endangered Act?" *Environment* 41:12-18, 34-38.

Bethell, Thomas N. 1986. *The Native Home of Hope: People and the Northern Rockies.* Salt Lake City, UT: Home Brothers.

Bleed, Ann S. 1993. "Climate and Hydrology." Pp. 45-49, 54, 56, 60-62 in *Flat Water: A History of Nebraska and its Water*, vol. March, edited by C. A. Flowerday. Lincoln, NE: University of Nebraska-Lincoln.

Blumm, Michael C. 1994. "The Rhetoric of Water Reform Resistance: A Response to Hobbs Critique of Long's Peak." *Environmental Law* 24:171-188.

Bormann, B. T., P. G. Cunningham, M. H. Brookes, V. W. Manning, and M. W. Collopy. 1993. "Adaptive Ecosystem Management in the Pacific Northwest."

Bowman, David. 1994. "Instream Flow Recommendations for the Central Platte River, Nebraska." National Ecology Research Center, Fort Collins.

Boyle Engineering Corporation. 2000. "Re-connaissance-Level Water Action Plan." Platte River Recovery Program Governance Committee, Cheyenne, WY.

Bromley, Daniel. 1992. *Making the Commons Work: Theory, Practice, and Policy.* San Francisco: Institute of Contemporary Studies Press.

Clarren, Rebecca. 2001. "No Refuge in the Klamath Basin." Pp. 1, 8-11 in *High Country News.* Paonia, CO.

CNPPID. 1999. "Annual Report." Central Nebraska Public Power and Irrigation District, Holdrege, NE.

Collier, M.P., R. H. Webb, and E. D. Andrews. 1997. "Experimental flooding in Grand Canyon." *Scientific American* January.

Corbridge, James N. Jr. and Teresa A. Rice. 1999. *Vranesh's Colorado Water Law.* Niwot: University Press of Colorado.

Cox, James L. 1967. *Metropolitan Water Supply: The Denver Experience.* Boulder: Bureau of Governmental Research and Science.

Currier, Paul J., and Craig A. Davis. 2000. "The Platte as a Prairie River: A Response to Johnson and Boettcher." *Great Plans Research* 10:69-84.

Currier, Paul J., Gary R. Lingle, and John G. Van Der Walker. 1985. *Migratory Bird Habitat on*

the Platte and North Platte Rivers in Nebraska. Grand Island, NE: Platte River Whooping Crane Critical Habitat Maintenance Trust.

Diffendal, R. F. Jr. 1993. "Understanding Groundwater Starts With Rocks: Geological Framework, Groundwater Occurrence and Irrigation Development in Nebraska." Pp. 50-54 in *Flat Water: A History of Nebraska and Its Water*, vol. March, edited by C. A. Flowerday. Lincoln, NE: University of Nebraska-Lincoln.

Dornbusch, A. J. Jr., B. M. Vining, and J. L. Kearney. 1995. "Total Resource Management Plan for Addressing Groundwater Concerns." Pp. 231-252 in *Conservation of Great Plains Ecosystems: Current Science, Future Options*, edited by S. R. Johnson and A. Boujaher. Dordrecht: Kluwer Academic Publishers.

Dreeszen, Vincent H and Ray Bentall. 1993. "A Letter to the Federal Energy Regulatory Commission About Nebraska's Platte River." Pp. 261-264 in *Flat Water: A History of Nebraska and Its Water*, vol. March, edited by C. A. Flowerday. Lincoln, NE: University of Nebraska-Lincoln.

Dreeszen, Vincent H. 1993. "Water Availability and Use." Pp. 82-86 in *Flat Water: A History of Nebraska and Its Water*, vol. March, edited by C. A. Flowerday. Lincoln, NE: University of Nebraska-Lincoln.

Dunbar, Robert. 1983. *Forging New Rights in Western Waters*. Lincoln: University of Nebraska Press.

Echeverria, John. 2001. "No Success Like Failure: The Platte River Collaborative Watershed Planning Process." *William and Mary Environmental Law and Policy Review* 25:559-604.

Eisel, L. and J. D. Aiken. 1997. "Platte River Basin Study: Report to the Western Water Policy Review Advisory Commission." U.S. Department of Commerce, Springfield, VA.

Eschner, T., R. Hadley, and K. Cromley. 1981. "Hydrologic and morphologic changes in channels of the Platte River basin : a historical perspective." U.S. Geological Survey, Denver, CO.

Forbush, Edward Home and John Bichard May. 1955. *A Natural History of American Birds of Eastern and Central North America*. New York: Bramhall House.

Freedman, Warren. 1987. *Federal Statistics on Environmental Protection: Regulation in the Public Interest*. New York: Quorum Books.

Freeman, David. 1989. *Local Organizations for Social Development: Concepts and Cases of Irrigation Organizations*. Boulder: Westview.

—. 2000. "Wicked Water Problems: Sociology and Local Water Organizations In Addressing Water Resources Policy." *Journal of the American Water Resources Association* 36:483-491.

Gaul, Steve. 1993. "Politics and Policy." Pp. 203-207, 209-230 in *Flat Water: a History of Nebraska and Its Water*, edited by C. A. Flowerday. Lincoln, NE: University of Nebraska at Lincoln.

Gerber, Leah R., Douglas P. DeMaster, and Simona P. Roberts. 2000. "Measuring Success in Conservation." *American Scientist* 88:316-324.

Gillilan, David M. and Thomas C. Brown. 1997. *Instream Flow Protection: Seeking a Balance in Western Water Use*. Washington, DC: Island Press.

Gordon, Nancy. 1995. "Summary of Technical Testimony in the Colorado Water Division 1 Trial." Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.

Gottlieb, Robert and Peter Wiley. 1982. *Empires in the Sun: the Rise of the New American West*. New York: Putnam.

Grooms, Steve. 1991. *The Cry of the Sandhill Crane*. Minnetonka, MN: North Word Press.

Halbert, C. L. 1993. "How Adaptive is Adaptive Management? Implementing Adaptive Management in Washington State and British Columbia." *Reviews in Fisheries Science* 1:261-283.

Holling, C. S. 1978. "Adaptive environmental assessment and management." New York: John Wiley.

Hydrosphere Resource Consultants. 1999. "Metropolitan Water Supply Investigation." Colorado Water Conservation Board, Boulder.

Interagency Ecosystem Management Task Force. 1996. "The Ecosystem Approach: Healthy Ecosystems and Sustainable Economies." National Technical Information Services, Washington D.C.

Johnson, W. Carter. 1994. "Woodland Expansion in the Platte River, Nebraska: Patterns and Causes." *Ecological Monographs* 64:45-84.

Johnson, W. Carter, and Susan E. Boettcher. 2000. "The Pre-settlement Platte: Wooded or Prairie River?" *Great Plains Research* 10:39-68.

Keyes, John. 2002. Pp. 2 in *Osborne hearings*.

Kittredge, William. 1996. *Who Owns the West?* San Francisco, CA: Mercury House.

Krech, Shepard III. 1999. *The Ecological Indian: Myth and History*. New York: W. W. Norton.

Lee, K. N. 1993. *Compass and gyroscope: integrating science and politics for the environment.* Washington, DC: Island Press.

Lee, K. N. and J. Lawrence. 1986. "Adaptive Management: Learning for the Columbia River Basin Fish and Wildlife Program." *Environmental Law* 16:431-460.

Lochhead, James. 2000. "Chronic and Emerging Water Issues in the South Platte/Front Range Corridor." in *Water and Growth in the West.*

Longo, Peter J. and Robert D. Miewald. 1989. "Institutions in Water Policy: the Case of Nebraska." *Natural Resources Journal* 29:751-762.

Luecke, Daniel F. 2000. "An Environmental Perspective in Large Ecosystem Restoration Processes and the Role of the Market, Litigation, and Regulation." *Arizona Law Review* 42:395-410.

MacDonnell, Lawrence J. 1985. "The Endangered Species Act and Water Development Within the South Platte Basin." Colorado Water Resources Research Institute, Fort Collins.

—. 1988. "Colorado law of underground water: a look at the South Platte basin and beyond." *University of Colorado Law Review* 59:579-625.

Madison, James. 1788. "No. 45." *The Federalist Papers*.

Mapstone, B. D., R. A. Campbell, and A. D. M. Smith. 1996. "Design of experimental investigations of the effects of line and spear fishing on the Great Barrier Reef." C.R.C Reef Research Centre, James Cook University, Townsville, Queensland, Australia.

Matter, Merrell J. 1969. *The Great Platte River Road*. Lincoln, NE: University of Nebraska Press.

Matthiessen, Peter. 2001. *The Birds of Heaven: Travels With Cranes*. New York: NY: North Point Press.

McCay, Bonnie and James Acheson. 1987. *The Question of the Commons: The Culture and Ecology of Communal Resources*, Edited by B. McCay and J. Acheson. Tucson: University of Arizona Press.

Melious, Jean and Robert Thornton. 1999. "Contractual Ecosystem Management Under the Endangered Species Act: Can Federal Agencies Make Enforceable Commitments." *Ecology Law Quarterly* 26:499-542.

Morgenweck, Ralph. 2001. "Untying the Gordian Knot: How to Recover Endangered Secies in

Nebraska and at the Same Time Allowing Water Users to Recover Their Water." *Colorado Water: Newsletter of the Water Center of Colorado State University* 18:20-24.
Murphy, Peter J. and Timothy J. Randle. 2001. "Platte River Channel: History and Restoration." Technical Service Center, Sedimentation and River Hydraulics Group, U.S. Bureau of Reclamation, Denver, Colorado.
Nestor, William. 1997. *The War for America's Natural Resources*. New York: St. Martins Press.
Neuman, Janet C and Michael C. Blumm. 1999. "Water for National Forests: the Bypass Flow Report and the Great Divide in Western Water Law." *Stanford Environmental Law Journal* 18:3-30.
Ogden, J. C. and S. M. Davis. 1994. "Everglades: the ecosystem and its restoration." Del Ray, FL: St. Lucie Press.
Olphin, Owen (Special Master). 2001. "Final Report of the Special Master in the Supreme Court of the United States." State of Nebraska (Plaintiff) V. State of Wyoming, et. al. (Defendants), Washington, D.C.
Opie, John. 1993. *Ogallala: Water For a Dry Land*. Lincoln, NE: University of Nebraska Press.
Ostrom, Elinor, Roy Gardiner, and James Walker. 1994. *Rules, Games, and Common-Pool Resources*. Ann Arbor: University of Michigan Press.
Outwater, Alice. 1996. *Water: A Natural History*. New York: Basic Books.
Peirce, Neal. 1972. *The Mountain States of America: People, Politics, and Power in the Rocky Mountain States*. New York: W.W. Norton.
Pisani, Donald. 1989. "The Irrigation District and the Federal Relationship: Neglected Aspects of Water History in the Twentieth Century." *The Twentieth Century West: Historical Interpretations*:257-292.
Platte River EIS Team. 2000. "Central Platte River 1998 Land Cover/Use Mapping Project, Nebraska." U.S. Department of the Interior, Bureau of Reclamation and the Fish and Wildlife Service, Denver, CO.
Reisner, Marc. 1986. *Cadillac Desert: The American West and Its Disappearing Water*. New York: Viking.
Riebsame, William and James J. Robb. 1997. "Atlas of the New West: portrait of a changing region." New York, NY: W. W. Norton & Company.
Ring, Ray. 1999. "Saving the Platte." Pp. 1, 13-17 in *High Country News*. Paonia, CO.
Rogers, Peter. 1996. *America's Water: Federal Roles and Responsibilities*. Cambridge: MIT Press.
Rohlf, Daniel J. 2001. "Jeopardy Under the Endangered Species Act: Playing A Game Protected Species Can't Win." *Washburn Law Journal* 41:114-163.
Ruckelshaus, William. 1997. *Stopping the Pendulum*, Edited by R. A. Percival, Dorothy. Philadelphia: Temple University Press.
Rundquist, Brad. 1993. "North Platte Decree Began in Argument Arising Out of 1934 Drought." Pp. 210-11 in *Flat Water: A History of Nebraska and Its Water*, vol. March, edited by C. Flowerday: University of Nebraska-Lincoln.
Sax, Joseph. 1999. "The ESA: Oil and Water?" in *Natural Resources Law Center 20th Summer Conference*. University of Colorado School of Law.
—. 2000. "Environmental Law at the Turn of the Century: A Repertorial Fragment of Contemporary History." *California Law Review* 88:2375.
Service, U. S. Fish & Wildlife. 1997. "Biological Opinion On The Federal Energy Regulatory Commission's Preferred Alternative for the Kingsley Dam Project (Project No. 1417) and

the North Platte Keystone Dam Project (Project No. 1835)." Department of Interior, Grand Island, Nebraska.
Shabecoff, Philip. 2000. *Earth Rising: Audubon Environmentalism in the 21st Century.* Washington, DC: Island Press.
Simons and Associates Inc. 2000. "Physical History of the Platte River in Nebraska: Focusing Upon Flow, Sediment Transport, Geomorphology, and Vegetation." U.S. Department of the Interior, Bureau of Reclamation, Fish and Wildlife Service, Platte River EIS Office, Lakewood, CO.
Smith, Zachary. 1989. *Groundwater in the West.* San Diego, CA: Academic Press.
—. 2000. *The Environmental Policy Paradox.* Upper Saddle River, New Jersey: Prentice Hall.
Stephenson, Kurt. 1994. "Governing the Commons: History and Evaluation of Local Democratic Groundwater Management in the Nebraska Upper Republican Natural Resource District." Doctoral Dissertation Thesis, Department of Economics, University of Nebraska, Lincoln, NE.
Study, Platte River Management Joint. 1993. "Platte River Habitat Conservation Program." Unpublished.
Thorson, John E. 1994. *River of Promise, River of Peril: the Politics of Managing the Missouri River.* Lawrence, KS: University Press of Kansas.
Tyler, Daniel. 1992. *The Last Waterhole in the West: The Colorado-Big Thompson Project and the Northern Colorado Water Conservancy District.* Niwot, CO: University Press of Colorado.
U.S. Fish & Wildlife Service. 1995. "Unpublished internal memorandum: Platte River Recovery Implementation Program." in *Known informally as "Sideboards Document".* Denver, CO: U. S. Fish & Wildlife Service.
—. 1997a. "Biological Opinion on the Federal Energy Regulatory Commission's Preferred Alternative for the Kingsley Dam Project (Project no. 1417) and North Platte/Keystone Dam Project (Project No. 1835)." U.S. Fish and Wildlife Service, Grand Island, NE.
—. 1997b. "Cooperative Agreement for Platte River Research and Other Efforts Relating to Endangered Species Habitats Along the Central Platte River, Nebraska." U.S. Fish and Wildlife Service, Denver.
Ugland, R. C., B. J. Cochran, M. M. Hiner, and R. D. Steger. 1993. "Water Resources Data. Colorado Water Year 1993. Volumes I and II. USGS Water Data Reports CO-93-1 CO-93-2." U. S. Geological Survey, Denver, CO.
Walkinshaw, Lawrence. 1973. *Cranes of the World.* New York, NY: Winchester Press.
Walters, C. 1997. "Challenges in adaptive management of riparian coastal ecosystems." *Conservation Ecology* 1:1.
Walters, C. J. 1986. *Adaptive management of renewable resources.* New York: McMillan.
Walters, C. J., L. Gunderson, and C. S. Holling. 1992. "Experimental policies for water management in the Everglades." *Ecological applications* 2:189-202.
Warner, James, W., Jon Altenhofen, and Jack Odor. 1994. "Recharge as Augmentation in the South Platte River Basin: Groundwater Program Technical Report #21." Department of Civil Engineering, Colorado State University, Fort Collins, CO.
Water and Power Resources Service. 1981. *Project Data.* Denver, Colorado: U.S. Government Printing Office.
Weiss, Wendy and James R. Montgomery. 1999. "Nebraska v. Wyoming: the End of Collaboration?" in *Natural Resources Law Center 20th Annual Summer Conference.*

Boulder, CO: University of Colorado School of Law.
Western Water Policy Review Advisory Commission. 1997. "Water in the West: the Challenge for the Next Century." Western Water Policy Review Commission, Denver, CO.
Whitman, Walt. 1982. *Complete Poetry and Collected Prose*. New York: Viking Press.
Williams, Ted 2002. "Lynx, Lies, and Media Hype." *Audubon*, May-June, pp. 24-33.
Wohl, Ellen, Robert McConnell, Jay Skinner, and Richard Stenzel. 1998. "Inheriting Our Past: River Sediment Sources and Sediment Hazards in Colorado." Colorado Water Resources Research Institute at Colroado State University, Fort Collins, CO.
Wood, Mary Christine. 1998. "Reclaiming the Natural Rivers: the Endangered Species Act as Applied to Endangered River Ecosystems." *Arizona Law Review* 40:197-286.
Woodward, Clyde. 1981. "Interim Report: South Platte River Basin Assessment, Colorado." Colorado Water Conservation Board, Denver.
Young, Oran. 1982. *Resource Regimes: Natural Resources and Social Institutions*. Berkeley: University of California Press.
Zallen, Margot. 1997. "Integrating New Values with Old Uses in the Relicensing of Kingsley Dam and Related Facilities." Natural Resources Law Center, Boulder, CO: University of Colorado School of Law.