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Platte River Basin Study, Report to the Western Water Policy Review Advisory Committee

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Platte River Basin Study

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**Report to the Western Water
Policy Review Advisory Commission**

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Report to the Western Water
Policy Review Advisory Commission

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Executive Summary

This report presents the results of an investigation of the Platte River basin completed for the Western Water Policy Review Advisory Commission. The basic objective of this investigation is to review existing water resources management and development programs and policies in the Platte River basin and to focus on how federal agency policies and programs could be more efficient and effective. Toward this objective, many past and present programs, policies, and projects were reviewed and analyzed including:

- Memorandum of Agreement/Cooperative Agreement process to establish a basin-wide recovery program for endangered species
- Kingsley Dam Relicensing
- Allard/Brown Task Force on Resolution of By-Pass Flow Issues
- Nebraska Statute LB 108
- EPA Middle Platte River Ecological Risk Assessment Program
- Colorado Senate Bill 74 Planning Study
- Efforts to resolve Habitat Flow Problems in the lower Platte (an intrastate problem)
- Efforts to resolve non-point source agricultural pollution problems in the central and lower Platte
- *Nebraska v. Wyoming* litigation
- Efforts to resolve Colorado front range municipal water supply problems
- Watershed management programs

The major force presently driving many water resources policies, management and development decisions in the Platte River basin is the Endangered Species Act (ESA). This act is affecting the nature and direction of municipal water supply planning and projects in the front range of Colorado, development of new storage projects in Wyoming, permitting of existing and proposed diversion and storage structures on federal lands, and the operation and management of the entire Platte River. The ESA is forcing the various stakeholders in the Platte River, including water users, water developers, state and federal management and regulatory agencies and

environmental organizations, into the current Memorandum of Agreement (MOA)/Cooperative Agreement process to develop a basin-wide recovery program for the endangered species of the Platte River. This ongoing effort represents the best available opportunity to develop a recovery program for the Platte River basin endangered species, thereby allowing water resources development and management to proceed, while complying with the Endangered Species Act. The states, together with the Department of the Interior, have assumed leadership roles in the MOA/Cooperative Agreement process.

Federal agency contributions to the MOA/Cooperative Agreement process have been varied. The U.S. Fish and Wildlife Service has previously developed estimates of species' habitat requirements through the Platte River Joint Management Study. The Service's continuing data collection efforts are an important task in development of a successful cooperative agreement. The Bureau of Reclamation has played an important role through its development of revised project operation procedures and project modifications to produce flows for the critical habitat. Potential contributions by the U.S. Geological Survey have been hindered because of that agency's reluctance to involve itself in policy matters. The Central Valley Improvement Project in California, the Upper Mississippi River Environmental Restoration Project, the Everglades Environmental Restoration Project, and the Columbia River Basin Salmon Restoration Program provide examples of environmental restoration projects that have been, or are being, planned and constructed according to congressional authorizations of various specificities. Based on these examples, congressional authorization provides direction and funding, which can increase the effectiveness and efficiency of the federal agencies in solving environmental restoration problems. Such congressional authorization in the case of the Platte River would depend on the desires of the three states; it is unclear whether sufficient interest and support exists among Colorado, Nebraska and Wyoming for increasing the involvement of the federal agencies in providing habitat flows in the Big Bend reach.

Attempted resolution of disputes over interpretation of the 1945 and 1953 Supreme Court decrees for the North Platte River has been the basis of the *Nebraska v. Wyoming* litigation. Most of these disputes involve traditional water resources conflicts concerning construction of additional reservoir storage, diversion of water from the alluvium of the North Platte River by wells, allowable irrigated acreage under terms of the decrees, and operation of the North Platte project. These traditional disputes involving interpretation of decree terms and limits can probably only be resolved through litigation. Settlement negotiations took place during 1996, continued into

1997 and appear to have more or less concluded as of June 1997. These discussions have resolved some issues (e.g., transit losses) but have left others unresolved (depletions by wells in Wyoming). Consequently, the matter is scheduled to proceed to trial in 1998.

The Colorado Department of Natural Resources and local units of government have assumed leadership in resolving conflicts over supplying municipal water demand in the front range area of Colorado. The Colorado Department of Natural Resources through its Metropolitan Water Supply Investigation and the Denver Water Department through its Integrated Resource Planning program have provided the vehicles and leadership to facilitate cooperation, with the potential of more cooperation in the future, among competitors for municipal water supply in the front range area. To date the federal agencies have had limited roles in this municipal water supply planning effort, except for the Army Corps of Engineers and its investigation of storage reallocation in Chatfield Reservoir, which is primarily a flood control facility on the South Platte River immediately upstream from Denver. This investigation by the Corps is being completed at the request of other entities.

The front range municipal water supply planning efforts indicate that with leadership, states and local water agencies can develop effective solutions. Successful implementation of these plans, however, is dependent on resolution of endangered species problems on the Platte River in Nebraska. If each of the participating entities in the front range municipal water supply planning process is faced with developing its own individual preferred alternative in order to avoid a jeopardy opinion on a proposed municipal water supply project, many of these projects will be infeasible. If, however, the MOA/Cooperative Agreement process is successful in developing a recovery program for the endangered species on the Platte River in Nebraska, this will significantly improve the implementation prospects for cooperative and coordinated municipal water supply projects in the front range area.

The FERC relicensing proceedings for Kingsley Dam have demonstrated the inefficiency and ineffectiveness that such procedures offer for resolving water resources conflicts. The relicensing procedures have been ongoing for more than 10 years and have now produced a draft Biological Opinion with numerous requirements that are probably unacceptable to the applicants and the other stakeholders. The Kingsley Dam FERC relicensing procedures demonstrate the necessity for developing an endangered species recovery program for the Platte River basin to facilitate orderly water resources management and development.

Based on review and analysis of existing and past attempts to resolve conflicts over water resources management and development in the Platte River basin, the following is recommended:

1. Federal funding and technical assistance in the Platte River Endangered Species Recovery Program should be expanded to levels commensurate with environmental restoration programs elsewhere, including the Columbia River Salmon Restoration Program, the Upper Mississippi Environmental Management Program, the Everglades Restoration Project in Florida and the Central Valley Improvement Project. These other programs and projects offer examples of significantly greater levels of federal funding and technical assistance than have been proposed for the Platte. Consideration should also be given to developing guidelines or regulations for federal cost sharing in environmental restoration projects. Such guidelines or requirements would be based on a determination of the federal interest in specific projects and would help insure equity in funding among various projects.
2. Federal water agencies should consider changing their planning procedures and project evaluation procedures to allow for more effective participation in environmental restoration and recovery programs. The Principles and Guidelines were originally developed to evaluate and justify individual projects; the Principles and Guidelines need to be modified to allow evaluation of projects incorporated in systems rather than individual projects (U.S. Water Resources Council, 1983 (a) and (b)). The Principles and Guidelines are being applied to maximize the National Economic Development account, while producing an environmentally acceptable project. This application practice together with the existing four accounts in the Principles and Guidelines is probably no longer relevant to many of today's water resources development and management projects, especially environmental restoration projects. Consequently, the relevant federal agencies should review the Principles and Guidelines and make necessary changes in order to make these evaluation procedures relevant to today's projects and programs. More adequate procedures for incorporating risk and uncertainty into decision making procedures, either in the Principles and Guidelines or in the agency regulations, should be considered for environmental restoration and recovery projects. The Bureau of Reclamation should consider either modifying its existing regulations pertaining to planning and environmental restoration projects or developing new regulations comparable to those already completed by the Corps of

Engineers for environmental restoration projects. This would permit the two major federal water agencies to at least have comparable planning procedures and requirements for environmental restoration projects.

3. The federal agencies need to develop better tools to provide technical support to the states in resolving water conflicts. Fundamental to solving many of the water resources conflicts in the Platte River basin is the development of a recovery program acceptable to the water users, federal agencies, environmentalists, and states. A model of the Platte River basin, including the alluvium, is a necessary tool required for developing a successful recovery program for the Platte River. Such a model, which all three states and the federal agencies would have to accept in order to make the model effective, would provide a vehicle for investigating and specifying operation and development plans capable of providing habitat flows to the Big Bend area. Development of the Colorado River Decision Support System for use in the Colorado River Endangered Fish Recovery Program provides an example of the importance of a decision support system in a recovery program. In order to be acceptable to all three states, such a flow model or decision support system would need to be developed cooperatively by the three states together with the federal agencies. Such a cooperative effort would require resolving some of the distrust that has existed between the states and federal agencies and that has prevented development of a Platte River flow model acceptable to all three states and the federal agencies in the past.

Another major contribution to development of a successful recovery program for the endangered species in the Platte River would be the establishment of more reliable quantitative linkages between flow characteristics and the response of individual species and their habitats. Substantial work has already been conducted by the U.S. Fish and Wildlife Service to develop quantitative estimates of the river flows and restored acres needed to protect threatened and endangered species. Much of this work was conducted under the auspices of the Platte River Management Joint Study with the involvement of water users and environmentalists. The goal of additional investigations to develop more adequate quantitative linkages between flow levels and species and habitat conditions should be based on sound science rather than political horse trading.

Development of more certain quantitative linkages would help resolve some of the conflicts and controversy over the flow rates, flow

duration and flow frequencies required for recovery of the endangered species in the Platte River. This would be helpful in resolving interstate conflicts over instream flows for the endangered species, as well as the intrastate conflicts in Nebraska over instream flows for wildlife in the lower reach of the Platte River below Columbus. Having a more precise and certain indication of the volume, frequency, and duration of flows required to maintain wildlife habitat at survival or higher levels should help resolve conflicts between Nebraska agricultural and wildlife interests over establishment of instream flows in the lower Platte.

The U. S. Fish and Wildlife Service could contribute significantly to the establishment of a Platte River Basin Recovery Program by assisting in the development and/or refining of these necessary quantitative linkages. It will not be possible to develop a perfect quantitative relationship between species requirements and flows, but if a set of functional relationships could be developed that were acceptable to the stakeholders for planning purposes, this would expedite development of a practical recovery program with a higher probability of successfully recovering the species, while minimizing or avoiding injury to existing water users.

4. Colorado, Nebraska, and Wyoming must establish necessary governance structures to administer the Platte River Basin Endangered Species Recovery Program. The states together with the federal agencies must establish a governance structure that will ensure appropriate state government and stakeholder involvement in developing and implementing the recovery program for the Platte River basin. The states and federal agencies must ensure that sufficient authority is transferred to this governance structure to allow for successful implementation of the recovery program. The governance structure should not be a river basin commission, but rather should have necessary authority and responsibility required to ensure successful development and implementation of the Platte River Basin Endangered Species Recovery Program. The Cooperative Agreement agreed to in principle by the three states and the Department of the Interior in June 1997 establishes a ten-member Governance Committee composed of representatives of the states, Department of the Interior, water users and environmental organizations. The Governance Committee will oversee activities under the Cooperative Agreement and will serve as a forum for dispute resolution.

The governance structure established must be appropriate to make decisions regarding future management of habitat vital to the conservation of migratory bird populations that migrate south to north across the entire nation. Colorado and Wyoming in particular confront only the potential costs of the recovery effort and will receive little direct benefit. Under these somewhat unique circumstances, the federal and the state agencies must join together to decide these issues.

5. The states need to be willing and politically able to develop certain legal and institutional mechanisms to resolve water conflicts; specifically, Colorado, Nebraska, and Wyoming need to develop and implement the legal and institutional mechanisms required for the Platte River Basin Endangered Species Recovery Program. The state of Nebraska needs to develop necessary legal and institutional mechanisms to protect flow conditions in the Big Bend reach and insure that flows targeted for meeting habitat flow requirements in the Big Bend reach actually reach that destination. This may involve developing a successor to Nebraska statute §46-252 and the statute incorporating LB108 to protect surface flows intended for the Big Bend reach from diversion by alluvial wells. Development by the state of Nebraska of necessary legal and institutional mechanisms to insure delivery of flows to the Big Bend region is required by the Cooperative Agreement.

6. At this time, revival of river basin planning entities, such as the Title II River Basin Commissions is not recommended. A common recommendation for solving conflicts in water policy among states, federal agencies, and local units of government is to establish a planning entity for the entire river basin or watershed. For the Platte River basin, an example of such an entity was the Missouri River Basin Commission established under the Water Resources Planning Act of 1967. A recommendation to reestablish a river basin commission type of entity for the Platte River basin is not made here. The Title II River Basin Commissions failed to achieve their objectives in the past because of reluctance by the states and federal agencies to provide sufficient authority to the river basin commissions to accomplish their missions. That reluctance still exists and, consequently, establishment of a river basin commission for the Platte River would probably not be successful today. The Governance Committee established under the Cooperative Agreement with its specifically defined objectives appears to be an

appropriate vehicle for developing and administering a recovery program for the Platte River basin.

7. In a similar manner, no recommendation is made to revive the U.S. Water Resources Council for purposes of promoting coordination in water resources planning and development among the states and federal agencies. The principal reason for the demise of the Water Resources Council was the general reluctance of the states and federal agencies to provide a single entity, such as the Water Resources Council, with sufficient authority and responsibility to meet its objectives. After reviewing the current water resources planning, management, and development situation in the Platte River Basin and elsewhere, it appears there is little indication of support from either the states or the federal agencies for a successor to the Water Resources Council, with sufficient authority to meet its goals and objectives.
8. The absence of formally established entities that are charged with resolving interstate, interagency, and interjurisdictional disputes over the management and development of water resources, places increased responsibility on the states and federal agencies to exert the necessary leadership to resolve these disputes. Leadership, such as was recently displayed by the Secretary of the Interior and the governors of the three states in developing the MOA/Cooperative Agreement process for establishing a recovery program for the Platte River basin endangered species, will be necessary to resolve existing and future water conflicts.
9. Platte River basin stakeholders, including states, federal agencies, environmental groups and water users, should realize the inefficiency, or inability, of litigation and adversary procedures (e.g., the FERC Kingsley Dam relicensing process) to successfully resolve interstate or basin-wide conflicts, such as providing necessary flows for endangered species habitat in the Platte River basin. Recognition of the inability of litigation to resolve these conflicts should promote more positive attempts, such as the MOA/Cooperative Agreement process, to develop a recovery program for the Platte River basin. Another alternative to avoid litigation, or at least reduce the probability of litigation, is the task force created by the 1996 Farm Bill (P.L. 104-127) to analyze major policy issues involving by-pass flow requirements placed on Forest Service Special Use Permits. Expensive, time-consuming and often nonproductive litigation may

be avoided, if the task force can assist in resolving some of these conflicts.

10. The Natural Resource Districts (NRDs) in Nebraska present a good example of early efforts to resolve water resource conflicts at the watershed or local level. A case study of the Central Platte Natural Resources District (CPNRD) indicates that these districts have had some success in resolving some issues (e.g., groundwater quality protection through fertilizer application regulations). With respect to resolving conflicts that involve issues extending beyond the watershed and outside the Natural Resources District, the NRDs have been less successful. For example, the CPNRD has been generally unsuccessful in managing groundwater depletion in its district due to its inability to either develop replacement sources of surface water supply or restrict groundwater pumping. Failure to develop replacement sources of surface water supply occurred because of CPNRD's inability to resolve instream flow issues for the endangered species, thereby demonstrating again the need for federal-state leadership in developing a basin-wide recovery program.

Section I

Introduction and Purpose

The Western Water Policy Review Act of 1992 (Pub. L.102-575, Title XXX, October 30, 1992, 106 Stat. 4693) authorized a broad-based review of western water policy and related legal and institutional issues. This legislation directed the president to carry out the investigation and send a report to Congress by October 2, 1997. Secretary of the Interior Bruce Babbitt has chartered the Western Water Policy Review Advisory Commission to assist in this activity.

For this report, the commission is carrying out a focused program of research and recommendation to the Secretary of the Interior. Two areas of research have been initiated: (1) a description of the status of water related resources in the West today, and (2) an investigation of how water is managed in western river basins and watersheds, with an emphasis on the federal role.

In line with this objective, the commission is conducting studies of six western river basins, of which this study on the Platte River basin is one. The goals of this river basin study are to research and prepare a report which:

- Summarizes the status of water resources management and development in the basin and defines water resources problems.
- Describes and analyzes past and current efforts to address water resources problems.
- Recommends practical policy and program changes, with an emphasis on the federal role, that would lead to more effective and efficient water resources management.

Basin Description

The Physical Basin

Both the North and South Platte Rivers originate in the Rocky Mountains of Colorado. Figure 1 presents a location map of the Platte River basin. The North Platte's headwaters are located in Jackson County, Colorado, from where it flows north into Wyoming. The South Platte originates in Park County, Colorado, southwest of Denver. The South Platte then flows

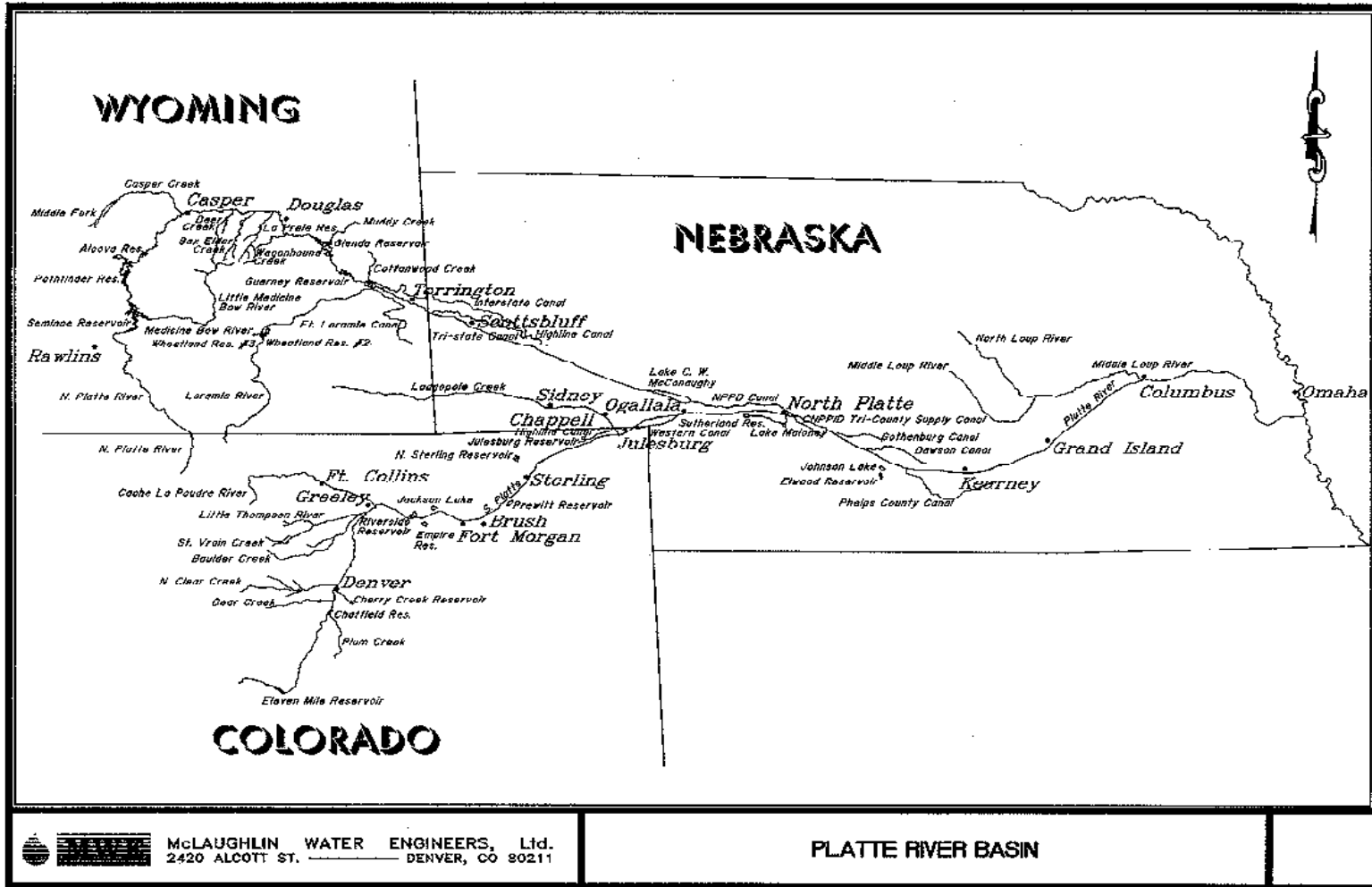


FIGURE 1

northward through the Denver metropolitan area and increases its flow from major tributaries that originate in the mountains to the west. The two main stems flow through High Plains until reaching their confluence near North Platte, Nebraska (about 312 miles upstream from the mouth of the Platte River near Omaha). The total basin area is about 90,000 square miles.

A large portion of the North Platte River basin in Nebraska is located in the Sandhills region, which is composed of rolling hills with sagebrush, native prairie grasses, and mostly sandy surficial soils. There is little surface water present in this area and there are no major tributaries to the North Platte River. Lake McConaughy, a 1.7 million acre-foot reservoir, is located 57 miles upstream from the confluence of the North Platte with the South Platte.

In central Nebraska, the Platte River flows through an area of valleys and plains with a significant widening and increased meandering. The Big Bend area with its wildlife habitat for the endangered species is located in this reach.

In eastern Nebraska, the Platte River flows through a region of rolling hills composed of loess deposits on undulating glacial material. The Platte River alluvium is an important groundwater resource in both central and eastern Nebraska.

Average annual precipitation across the basin increases from west to east, ranging from about 14 - 18 inches along Colorado's front range to approximately 32 inches at the confluence with the Missouri River. About 70 percent of annual precipitation generally occurs between April and September.

The economy in most of the Platte River basin is closely tied with agricultural production. In general, cattle and other livestock production are the largest agricultural sector. Although much corn and other feedgrains are produced within the basin, most of these are utilized for livestock production. The north, south, and main stem of the Platte River are used heavily for irrigation. The area around the Platte River is irrigated using canals and other diversions from the river.

Major reservoirs have been developed on both the North and South Platte Rivers (see Figure 2). On the South Platte River there are 106 storage facilities holding approximately 2.8 million acre-feet of water. Upstream of Lake McConaughy on the North Platte River, there are approximately

84 storage facilities with the capacity of 4.3 million acre-feet, including the large mainstem reservoirs operated by the Bureau of Reclamation. Lake McConaughy accounts for approximately 1.74 million acre-feet in addition to the storage on the North and South Platte. Figure 2 presents additional data on reservoir storage in the Platte River basin.

Critical Water Problems

The critical water problems in the Platte River basin that are analyzed in this report include:

- Flows for endangered species habitat in the central Platte: A federal and interstate problem
- Flows for wildlife in the lower Platte: An intrastate problem
- Non-point pollution of the central and lower Platte reaches from agricultural chemicals
- The *Nebraska v. Wyoming* dispute
- Denver Metro water supply needs
- The central Platte watershed: A case study

These problems are described to provide some basis for the analysis that follows. Analysis of the effectiveness of federal, state and local programs to resolve these water resources problems is then presented with concentrations on:

- Governance structures that promote collaborative efforts of local groups, jurisdictions and levels of government.
- Voluntary marketing, banking or transfer of water rights to facilitate more flexible utilization of the resource.
- Implementation of water conservation efforts to reduce demand.
- Scientific research, data collection and the use of decision support systems to foster wider participation and agreement on issues of fact or management strategies.

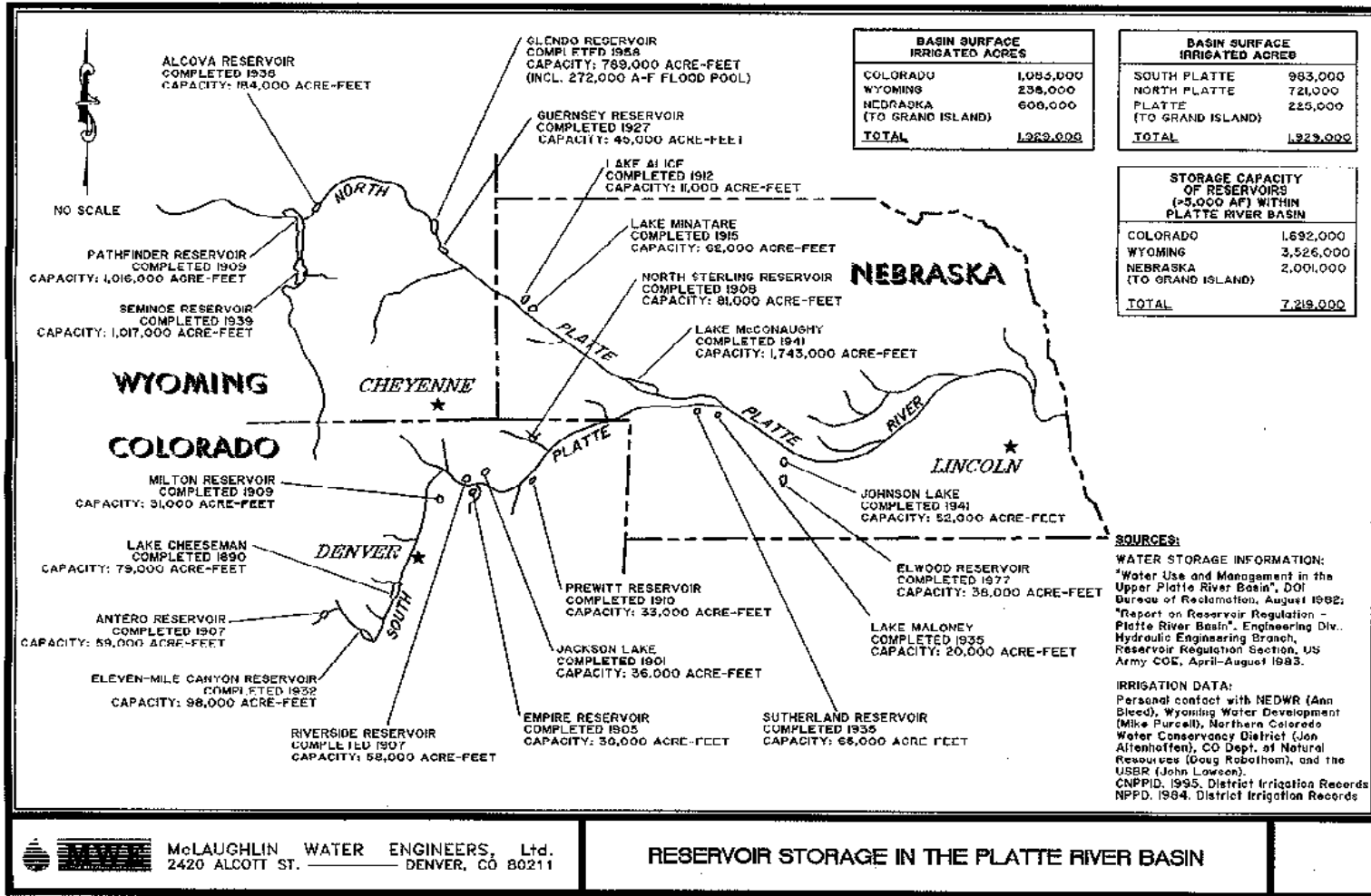


FIGURE 2

- The possibility of employing a revived U.S. Water Resources Council to resolve the existing and expected future water resources policy and planning problems in the Platte River basin.
- The possibility of using a Title II River Basin Commission type of entity to resolve the existing and expected future water resources policy and planning problems in the Platte River basin.
- Promising efforts to coordinate resolution of problems basin-wide and encourage efficient and flexible use of water resources.

Section II

Critical Water Problems in the Platte River Basin

Introduction

This section presents a basic overview and description of several critical water problems in the Platte River basin including:

- Flows for endangered species in the central Platte (a federal and interstate problem)
- Flows for wildlife in lower Platte (an intrastate problem)
- Non-point pollution of the central and lower Platte from agricultural chemicals
- *Nebraska v. Wyoming* dispute
- Metropolitan Denver water supply needs
- Local watershed case study

This section primarily presents an analysis and description of the problem with emphasis on the decision making vehicles used in resolving the problem. In Section III a detailed analysis concerning the adequacy and efficiency of these decision making and management vehicles is presented.

Flows for Endangered Species in the Central Platte: A Federal and Interstate Problem

Overview and Description

Flow to maintain habitat for the endangered species of birds (Whooping Crane, Piping Plover and Least Tern) in the central Platte River in Nebraska is one of the crucial water resource management problems in the Platte River basin. The problem is to provide flows of sufficient amounts, duration and frequency to maintain habitat for the endangered species (Van Derwalker, 1988).

Numerous efforts have been completed or are presently underway to assist in resolving conflicts over providing these habitat flows including:

1. The Platte River Management Joint Study was ongoing from 1985 through 1993. This joint effort had the objective of recovering endangered species within the Platte River basin and is presented herein because of its importance as a precursor to the Memorandum of Agreement process.
2. The Memorandum of Agreement process to establish a recovery program for the endangered species on the Platte, thereby avoiding continued conflicts over jeopardy opinions resulting from Section 7(a)(2) consultations for individual projects. The MOA process involves the states of Colorado, Nebraska and Wyoming and the federal government.
3. FERC relicensing of Kingsley Dam on the North Platte River. The operation of this reservoir can play a role in preserving the wildlife habitat for the endangered species.
4. Management of tributary wells in Nebraska. This is another important effort to preserve habitat because of the depletive effects these wells may have on water being conveyed to the critical habitat reach.
5. The Colorado Senate Bill 74 planning study. This effort, currently underway, includes provisions for providing water to the critical reach of the Platte for wildlife habitat preservation.
6. The *Nebraska v. Wyoming* litigation. The court action could potentially affect the endangered species wildlife habitat issues, but to date has not directly addressed these issues.
7. Efforts to resolve the “by-pass flow” issue. This has involved the issuance of permits for existing water diversion and water storage facilities on federal lands and is affecting resolution of the endangered species habitat issues. The by-pass flow issue is discussed further below.

Platte River Management Joint Study

The Platte River Management Joint Study originated in 1984-1985 and continued through 1993. The joint study originated from the jeopardy opinion on the Narrows Project on the South Platte River. The objective of the joint study was to develop a cooperative interstate and interagency

approach to resolving the jeopardy opinion and provide for recovering the endangered species. A key component of the joint study was the management alternatives work group, which was formed to develop alternatives for recovering endangered species. There were numerous difficulties in the process, especially the withdrawal from the joint committee by the state of Nebraska, which resulted in termination of the joint study effort in 1993. Prior to termination of the group in 1993, a draft recovery implementation program had been prepared by the management alternatives work group, but was never accepted by the participants as a whole (Platte River Management Joint Study, 1993). The demise of the joint study effort preceded the development of the Memorandum of Agreement/Cooperative Agreement process.

Memorandum of Agreement/Cooperative Agreement

Overview.—Under section 7(a) of the federal Endangered Species Act, 16 USCA §1536(a), federal agencies must consult with the U.S. Fish and Wildlife Service (FWS) to determine whether proposed federal actions will jeopardize the continued existence of threatened or endangered species, or destroy or adversely modify habitat. FWS prepares a Biological Opinion that indicates whether the proposed federal action will not harm endangered or threatened species or their habitat (a non-jeopardy opinion) or will harm species and/or habitat (jeopardy opinion) 16 USCA §1536(b)(4). If FWS issues a jeopardy opinion, it must identify reasonable and prudent alternatives that would avoid jeopardy.

In March 1994, the U.S. Fish and Wildlife Service produced a white paper estimating that flow deficits for the Big Bend area would be approximately 417,000 acre-feet per year for the average year. The Fish and Wildlife Service indicated that the 417,000 acre-feet per year represented the difference between existing flows and what flows were needed to protect wildlife habitat on the Platte as estimated by the Service. This initial estimate of the flow deficits was not accepted by the involved states. In June 1994, a MOA was signed by the states of Nebraska, Colorado and Wyoming together with the United States. This memorandum allowed one year for development of a recovery program plan that was acceptable to the three states and the United States. Subsequent to signing of the MOA, the FWS revised their estimates of flow deficits in the Big Bend area in the “side boards” document. This revision resulted in reducing the estimated flow deficits from approximately 417,000 acre-feet per year on the average to 130,000 - 150,000 acre-feet per year. This 130,000 - 150,000 acre-feet per year is the amount necessary to be supplied to the habitat for the first

increment of the Memorandum of Agreement/Cooperative Agreement (anticipated to be 10 years or more). Additional water beyond 130,000 - 150,000 acre-feet per year is to be determined through the adapted management and peer review processes. The 130,000 - 150,000 acre-feet per year estimate represents the portion of the total flow deficits the Department of the Interior and the states have agreed to use as the goal for Phase I of the proposed MOA/Cooperative Agreement. By June 1995, the states and the federal government had not yet reached agreement on development of the recovery program and extended the deadline in the MOA for development of the recovery program to mid-December 1996.

During the latter part of 1995, the Pathfinder Reservoir modification alternative was developed, which involved replacing storage in Pathfinder Reservoir lost to sedimentation by increasing the height of Pathfinder Dam. Other sources of water for the wildlife habitat in the Big Bend reach of the Platte River were developed during this period including the Tamarack Plan (named after the Colorado Division of Wildlife Tamarack property) and the revised Nebraska Plan. The Tamarack Plan would divert water from the South Platte River in Colorado for approximately 10,000 acre-feet of groundwater recharge in highly permeable sand hill areas near the South Platte during November to March. This water would then return to the Platte River as groundwater return flows, but with an altered time pattern of return flows that would produce benefits to the Big Bend reach. The Nebraska Plan included an environmental storage account in Lake McConaughy for purposes of releasing water for the Big Bend reach. The reduction in shortage produced by the Pathfinder modification plan, Tamarack plan and the environmental account in Lake McConaughy was expected to provide approximately 70,000 acre-feet per year. Therefore approximately 60,000 to 80,000 acre-feet per year of water would still be required to meet the revised FWS goal of 130,000 - 150,000 acre-feet per year.

During early 1996, concern was raised by the MOA negotiating group with the necessity of complying with NEPA (U.S. Department of the Interior, et al, 1996). Concern about complying with NEPA resulted in a change in MOA strategy from establishing a recovery program to producing a cooperative agreement that will meet NEPA compliance requirements in three years for the associated recovery program. The FWS also agreed to rely upon this Cooperative Agreement during the three-year NEPA compliance period in order to avoid issuing non-jeopardy opinions in Section 7 consultations.

During 1996, allocation of cost for the MOA generated recovery program among the states and federal government was initially discussed. Growing out of these discussions was the cost sharing arrangement contained in the Cooperative Agreement, which involved the federal government paying 50 percent of the total expected cost of approximately \$75 million for phase I of the recovery program with the states dividing the remaining 50 percent on a 40 percent (Nebraska), 40 percent (Colorado), and 20 percent (Wyoming) basis (see Table 1). This cost sharing involved not only cash and cash equivalents (e.g., land) but also in-kind contributions.

Table 1.—MOA Program Contributions, Years 1-15¹⁾
values in millions of 1997 dollars)

Cash and Cash Equivalents²⁾						
	CO	WY	NE	States' Total	Federal	Total
Years 1-3						
Cons Study	0.3	0.3	0.3	0.9	0.0	0.9
Habitat Cash Equiv)	0.0	0.0	5.3	5.3	0.0	5.3
Other Cash	0.6	0.3	0.4	1.3	7.5	8.8
Total	0.9	0.6	6.0	7.5	7.5	15.0
Years 4-6						
Cash	2.475	0.85	0.0	3.325	7.5	10.825
Years 7-15						
Cash	7.425	2.55	0.0	9.975	22.5	32.475
Totals for Cash and Cash Equivalents						
Years 1-6	3.375	1.45	6.0	10.825	15.0	25.825
Years 1-15	10.8	4.0	6.0	20.8	37.5	58.3
Water Projects						
Years 1-15	4.2	3.5	9.0	16.7	0.0	16.7
Program Totals						
	15.0	7.5	15.0	37.5	37.5	75.0

¹⁾ From: Cooperative Agreement For Platte River Recovery and Other Efforts Relating to Endangered Species Habitats Along the Central Platte River, Nebraska.

²⁾ Individual signatories may propose to the Governance Committee that certain interim measures undertaken prior to the execution of the Cooperative Agreement may be credited to their cash or cash equivalent contributions.

In May 1997, negotiators from Colorado, Nebraska, Wyoming and the Department of the Interior reached agreement in principle on the elements of a proposed program to restore and protect the habitat of listed endangered species in central Nebraska (States of Colorado, Nebraska, and Wyoming and the Department of the Interior, May, 1997). Reportedly, the governors of the three states and the Secretary of the Department of the Interior will sign the Cooperative Agreement to establish this proposed program in July 1997. The key elements of the Cooperative Agreement include (see States of Colorado, Nebraska, Wyoming and the Department of the Interior, 1997, and Zallen, 1997):

1. During the expected three years of the Cooperative Agreement, the states and the Department of the Interior are to develop a basin-wide recovery implementation program for the endangered species in the central Platte River that would serve as the reasonable and prudent alternative for existing and new water related activities in the Platte River basin. The Cooperative Agreement provides that at the end of the Endangered Species Act and NEPA review period, the states and the Department of the Interior will enter into a new agreement that will formally establish the recovery program. Based on the results of the Endangered Species Act and NEPA review, the Fish and Wildlife Service may determine that the proposed program is inadequate or must be modified to serve its purpose. In that event, the states and the Fish and Wildlife Service will need to renegotiate the program. If the parties do not enter into an agreement establishing a program, or if the parties do not complete the activities required under the Cooperative Agreement, the Fish and Wildlife Service will reinstate its original consultation on any and all permits and activities that have relied on the interim protections offered under the Cooperative Agreement.
2. This basin-wide recovery implementation program which will be developed under the Cooperative Agreement will be done in accordance with the NEPA process. Components of the proposed alternative include three proposed water re-regulation projects, a water conservation program and programs for offsetting depletions from new water related activities including ones not subject to Endangered Species Act consultation.
3. The costs of the Cooperative Agreement activities (approximately \$70 million for the first increment) are to be shared equally by the Department of the Interior (\$37.5 million) and the states

(\$37.5 million). The states have agreed to split their share with Colorado and Nebraska each responsible for 40 percent and Wyoming responsible for the remaining 20 percent.

4. The Reasonable and Prudent Alternative for Section 7 consultations during the term of the Cooperative Agreement will provide for existing projects to be treated the same as the Colorado front range cities in the by-pass flow matter (see "By-Pass Flow Issue" in Section II herein). In this case, the existing projects will be responsible for their share of the land and water needed to restore the habitat in the critical habitat reach. New projects are to replace their consumptive use below their diversions but the replacement is to be in the same state as the diversion.
5. Under the proposed alternative (i.e., the long-term program which will come into being after it is developed during the approximately three year period under the Cooperative Agreement), one objective is to reduce the target flow shortage by 130,000 to 150,000 acre-feet annually during the first increment of the proposed program alternative. The states disagree on the Fish and Wildlife Service's target flow numbers, but will use them for certain purposes until modified by the Fish and Wildlife Service based on a peer review process during the first increment. Under the proposed program alternative, the states will re-regulate flows to reduce shortages by 70,000 acre-feet. Wyoming proposes to modify Pathfinder Dam (i.e., the three bricks project) to provide an additional 54,000 acre-feet of storage, which has been lost to sedimentation. This additional storage is expected to provide an average yield of approximately 25,000 acre-feet for the downstream habitat and 9,600 acre-feet for additional municipal water supply. Nebraska's share of water is to be supplied by the Central Nebraska Public Power and Irrigation District and the Nebraska Public Power District, which will supply this water from a 100,000 acre-foot environmental account in Lake McConaughy that will be administered by the Fish and Wildlife Service. Colorado will provide an average of 10,000 acre-feet per year to the South Platte River from the Tamarack project, a groundwater recharge project near the Colorado-Nebraska state line, which will divert unappropriated flows and provide water during periods of shortage.
6. The remaining 60,000 - 80,000 acre-feet of shortage reduction will be achieved through water conservation and water supply projects, which will be identified through a study during the first 18 months after the

- Cooperative Agreement is signed (see Tab 4, Appendix A in States of Colorado, Nebraska, Wyoming and the Department of the Interior, May 1997).
7. Each state will be responsible for mitigating future depletions in its own state. Colorado will measure the amount of mitigation required based on a population growth methodology and the source of water required to serve the additional population (e.g., tributary or non-tributary groundwater, imported water, or transfer of agricultural water rights). Colorado estimates it will require an additional supply of 10,000 acre-feet per year over the next 15 years and plans to supply this water from additional groundwater recharge projects (see Tab 3B in States of Colorado, Nebraska, Wyoming and the Department of the Interior, May 1997). Wyoming and Nebraska will develop their proposals for mitigating future depletions from future water development projects during the terms of the Cooperative Agreement (see Tabs 1B and 2B in States of Colorado, Nebraska, Wyoming and the Department of the Interior, May 1997). Releases from Pathfinder Reservoir in Wyoming to the environmental account in Lake McConaughy and releases from the Tamarack project and from the environmental account in Lake McConaughy to the critical habitat area must be legally protected from existing and new ground and surface water diversions. Nebraska has committed to enact remedial legislation, if necessary, within two years of agreement on this program to protect flows (see Task W3-3 in Attachment I to Cooperative Agreement, States of Colorado, Nebraska, Wyoming and the Department of the Interior, May 1997).
 8. The proposed program alternative uses an incremental adaptive management approach whereby the response of species and habitat will be monitored and revisions made and the measures and goals based on such response. The length of the first increment is from 10 to 13 years and is to be based on the time it will take to accomplish the water conservation measures and for the species to respond to the land and water conservation measures.
 9. The Cooperative Agreement and proposed program alternative provide for a governance structure which establishes a Governance Committee to oversee the Cooperative Agreement and the program.

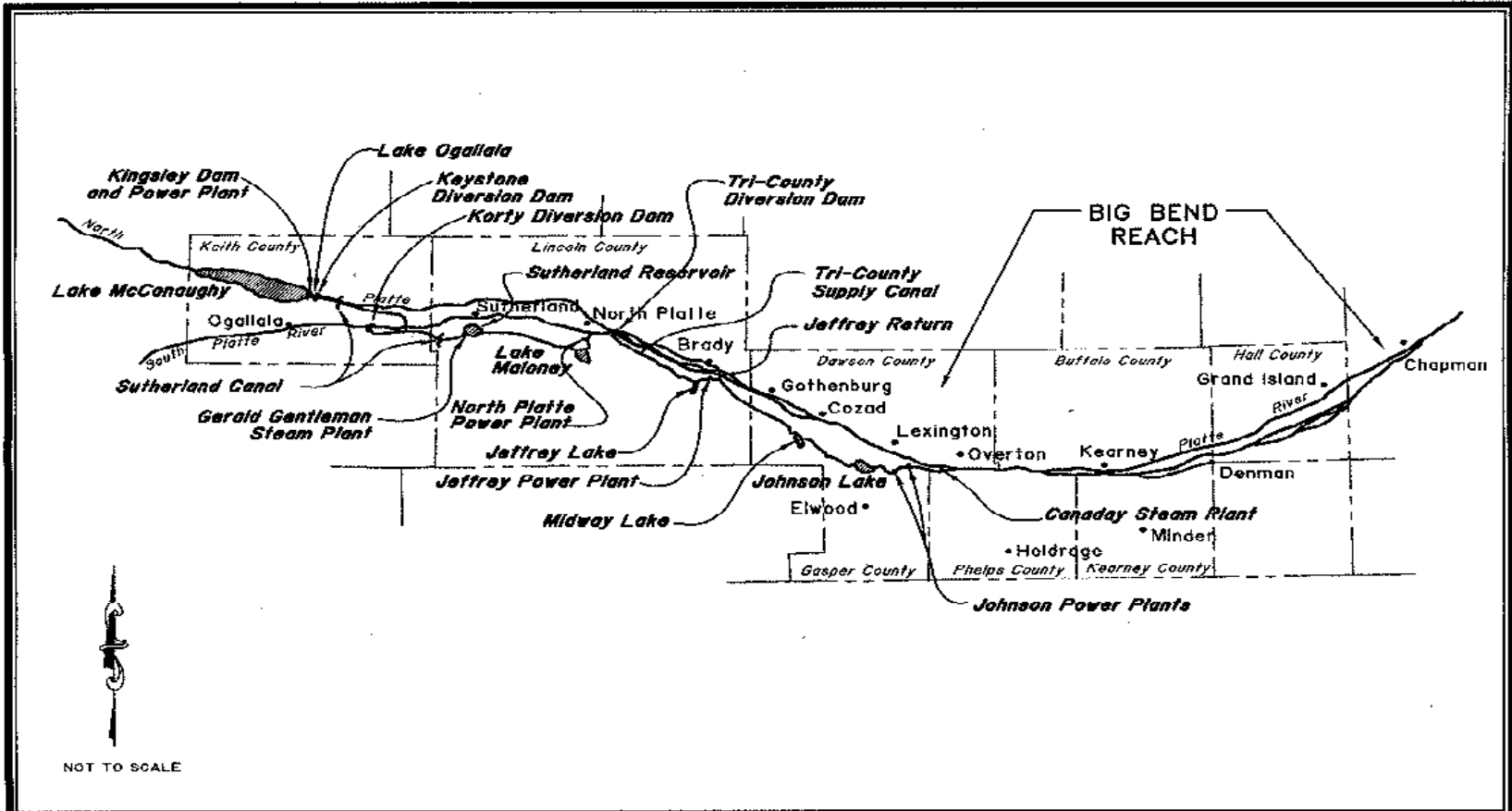
The MOA/Cooperative Agreement process has been less successful in including environmental groups and their concerns. This lack of success is


characterized by the withdrawal from the MOA/Cooperative Agreement process by the National Audubon Society and the Platte River Whooping Crane Maintenance Trust. The National Audubon Society and the Platte River Whooping Crane Maintenance Trust contend that the MOA/Cooperative Agreement process has been biased in favor of the states and against the broader responsibilities of the federal government. This bias, in the opinion of the National Audubon Society and the Platte River Whooping Crane Maintenance Trust, has been deleterious to the recovery of the endangered species. As stated by the National Audubon Society and the Platte River Whooping Crane Maintenance Trust in comments on the draft version of this report: “The protection of endangered migratory wildlife is a responsibility of the national government which cannot properly be delegated to states with narrow development interests without substantially undermining national environmental policies” (Echeverria and Currier, 1997).

Kingsley Dam FERC Relicensing

Project Description.—Central Nebraska Public Power & Irrigation District (Central) and the Nebraska Public Power District (NPPD) cooperatively operate the Kingsley-McConaughy system as a hydroelectric generation and irrigation water supply project (see figure 3). Water stored behind Kingsley Dam in the 1.7 million acre-feet Lake McConaughy, near Ogallala, is used for hydroelectricity production throughout the year. Central has installed three hydro facilities to generate power off water routed through Central's canal system. During the irrigation season some water is diverted from hydropower production for irrigation purposes.

Water is diverted immediately below McConaughy by NPPD's Keystone diversion dam into the NPPD Sutherland supply canal where the water is routed to the NPPD Sutherland Reservoir and Lake Maloney (near North Platte) for hydropower production at the 24 megawatt (MW) North Platte Power Plant. NPPD also supplies water to several private irrigation ditch companies in the Sutherland-North Platte area. The water returns to the Platte from the North Platte power plant return and is diverted by the Tri-County Diversion Dam a few miles downstream into the Tri-County Supply Canal. Here water is diverted through the 18 MW Jeffrey Hydroelectric Plant, the two Johnson Hydroelectric Plants (18 MW each) and the 108 MW Canaday Steam Power Plant.




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LOCATION MAP
PLATTE RIVER UPSTREAM FROM
GRAND ISLAND, NEBRASKA

PLATTELDWG 2/26/97

FIGURE 3

Below the Jeffrey Power Plant water can be returned from the Tri-County Supply Canal to the river near Brady. This canal supplies water to several private ditch companies in the Gothenburg-Kearney area. Above the Johnson regulating reservoir water can be diverted from the Tri-County Canal into the E-65 canal for delivery to Central irrigators in the Elwood-Holdrege-Minden area. The Elwood regulating reservoir provides E-65 storage. From Johnson Reservoir, water may also be diverted to the E-67 irrigation supply canal. Below the two Johnson power plants water may be either returned to the Platte via the Johnson-2 (J-2) return, or may be diverted into the Phelps Canal to supply irrigators. The J-2 return is located between Lexington and Overton. Overton is where the critical Whooping Crane habitat begins (FERC, 1994, pp. 2-3 to 2-5).

McConaughy is managed as a fishery resource by the Nebraska Game & Parks Commission (GPC) (FERC, 1994 p. 2-7). McConaughy is a significant recreational resource with 600,000-720,000 annual visitors, 74% of which are out-of-state (FERC, 1994 p. 1-8).

Federal Power License Requirement.—Kingsley Dam and Lake McConaughy were constructed as Works Progress Administration projects during the Great Depression of the 1930s. The two 50-year federal hydropower licenses for Kingsley expired June 29 and July 30, 1987. Environmental groups persuaded Congress in 1986 to amend the Federal Power Act to require equal FERC consideration in all licensing proceedings of “energy conservation, the protection, mitigation of damages to, and enhancement of fish, wildlife (including spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality” in addition to the power generation and economic development purposes for which licenses were originally issued (16 USCA §797(e)). Thus FERC in the Kingsley relicensing is required to consider, among other things, wildlife habitat mitigation and enhancement equally with power production and irrigation.

1992 Draft Environmental Impact Statement.—FERC considered several alternatives for protecting endangered species habitat in its 1992 draft environmental impact statement (DEIS), including alternatives proposed by the applicants, by environmental intervenors, and by the FERC staff (FERC 1992, pp. xxvii-xxxii). In its comments on the DEIS the state of Nebraska proposed a new alternative, creation of an Environmental Account to meet habitat water supplies. The state of Nebraska’s Environmental Account proposal is noteworthy in that (1) the state took an active role in relicensing proceedings, and (2) the Environmental Account represented an innovative approach for dealing with fluctuating water availability and habitat needs.

Briefly, under the Environmental Account, a block of water would be annually credited to the Environmental Account to be managed by the Nebraska Game and Parks Commission. In years when all habitat water requirements could not be satisfied, the GPC would have discretion to allocate water from the Environmental Account as it best saw fit.

1994 Revised Draft Environmental Impact Statement.—FERC evaluated the state of Nebraska’s Environmental Account proposal in its 1994 revised draft environmental impact statement (RDEIS) (FERC 1994, pp. 5-16 to 5-21). The FERC staff recommended implementing the Modified Nebraska Plan (FERC 1994 pp. 5-33 to 5-36).

Section 7 Consultation Requirement.—As a part of the Kingsley/Keystone relicensing process, FERC was required to consult with the United States Fish and Wildlife Service (FWS) under Section 7 of the Endangered Species Act. As discussed earlier, when federal agencies request Section 7 consultation, FWS prepares a Biological Opinion indicating whether the proposed federal action will not harm endangered or threatened species or their habitat (a non-jeopardy opinion) or will harm species and/or habitat (jeopardy opinion). If FWS issues a jeopardy opinion, it must identify reasonable and prudent alternatives to be implemented by the appropriate federal agency that would avoid jeopardy.

FERC Proposed Action.—In order to relicense Kingsley and Keystone, FERC recommended that several conditions related to these facilities be implemented. These conditions include:

1. Operational guidelines
2. Use of an environmental account
3. Water conservation
4. River channel and land restoration, and
5. Other measures.

The operational guidelines proposed by FERC primarily centered around meeting specified base flow conditions in the central Platte River at Overton. The quantities of base flows would vary, but would not provide the entire water needs for all the species present.

The environmental accounting proposed by FERC would earmark a portion of Lake McConaughy’s stored water for fish and wildlife purposes. The amount of storage required would depend on the reservoir level on October 1 of any given year and expected inflows during the winter months. The intention was for the GPC to manage the environmental account.

The water conservation requirement would implement a plan that was estimated to conserve 10 to 20 percent of the surface water irrigation demand. The plan specified that 50 percent of the net conservation savings would be used to provide instream flows for fish and wildlife resources.

River channel and land restoration would require the development and implementation of a plan to restore adjacent non-wooded, wet meadow/wetland habitat for Whooping Cranes in 8,400 acres along the central Platte River. Eight permanent riverine nesting sites would be provided to improve the nesting habitat for Least Terns and Piping Plovers.

Each of these areas set aside for the species would be phased in over a 15-year period. Other measures that would be required within this proposed action are:

1. No new or expanded water service contracts could be provided by either facility,
2. Long term plans for passing sediment at the Korte and Central Diversion Dams would have to be developed and implemented,
3. The effectiveness of this action would have to be assessed in light of enhancing fish and wildlife resources (U.S. Fish and Wildlife Service, 1996).

FWS Evaluation of Proposed Action.—The FWS evaluated the proposed action using an environmental baseline approach. This approach assumed the condition of these facilities as not being present on the river. The analysis sought to determine the effects on the environment of the existing facilities and compare these effects to the forecast conditions should these projects be absent. The FWS then analyzed the effect of the proposed action relative to these two situations (U.S. Fish and Wildlife Service, 1996).

The proposed action was judged to cause an average annual stream flow depletion of 22 percent at Grand Island, Nebraska. This depletion was then evaluated against the flow and habitat requirements of the federally listed species. This evaluation judged that instream flow shortages for the federally listed species would be approximately 137,000 acre-feet per year compared to the theoretical baseline condition. The FWS concluded that the proposed action would improve instream flow conditions by approximately 12,000 acre-feet per year compared to the present condition. As a result of this analysis the FWS concluded that the proposed action would result in jeopardy of the continued existence of the federally listed species or destroy the designated critical habitat of these species. Hence, the FWS suggested

the reasonable and prudent alternative (U.S. Fish and Wildlife Service, 1996).

Reasonable and Prudent Alternatives.—Two sets of alternatives were developed by the FWS to address the perceived deficiencies in the proposed action. These alternatives, identified as RPA-I and RPA-II, assumed different management environments. RPA-I envisioned its implementation by the licensed recipients. RPA-II assumed the licensees' involvement in a Platte River basin-wide recovery program (U.S. Fish and Wildlife Service, 1996).

RPA-I involved the following:

1. Water management
2. Water conservation
3. Wildlife habitat development, and
4. Other measures.

The water management proposed in RPA-I would establish an environmental account for storage in Lake McConaughy. The amount being stored for the environmental account would depend on inflow to Lake McConaughy, subject to some capping limitations.

Water conservation would be required of the licenses, achieving a net annual water savings of 10 percent. Some of this water savings would be allocated to the environmental account.

Four habitat complexes totaling approximately 8,800 acres would be developed in order to restore, in perpetuity, suitable riverine and adjacent wetland habitat. These complexes would be phased in over 15 years.

Several other measures were required within RPA-I including:

1. Prohibition from storing, diverting or consuming water from upstream sources earmarked for instream flows,
2. Barring service to expanded irrigated acreage by the licenses,
3. Fulfilling the legal requirements required for water stored and released for the benefit of fish and wildlife as a result of this alternative, and
4. Monitoring the effectiveness of RPA-I relative to its intended affect on wildlife habitat.

RPA-II is the second Reasonable and Prudent Alternative offered by the FWS. RPA-II is intended to involve the licensees in the settlement of the current Platte River Recovery Implementation Program that is being negotiated among the three basin states, the Department of the Interior and other interest groups. The Cooperative Agreement (States of Colorado, Nebraska and Wyoming and the Department of the Interior, May 1977) that will reportedly be signed in July 1997 incorporates similar components to RPA-I and II; however, these are differences (see Memorandum of Agreement/ Cooperative Agreement section herein).

Nebraska Statute LB108

An issue in the MOA negotiations among the three states and the federal government has been how Nebraska can ensure that water released by Colorado or Wyoming for habitat purposes can be protected from withdrawal from the stream by alluvial well pumping. Nebraska statutes authorize the Nebraska Department of Water Resources (DWR) to protect from withdrawal water conducted in a stream from instate or out-of-state sources for instream or out-of-stream uses (NRS §46-252(1)). This provision is not explicitly limited to direct stream diversions, and could be interpreted as authorizing DWR regulation of wells that interfere with water being conducted in a stream for habitat maintenance purposes. However the issue of wells interfering with the flow of water being conducted in a stream for habitat purposes has never been raised relative to NRS §46-252(1).

Legislation adopted in 1996, LB108, authorizes natural resource districts (NRDs) and the DWR to regulate well drilling and pumping to deal with conflicts between users of hydrologically connected surface and groundwater in "integrated management areas" (NRS §46-656.01 to -656.67). Under LB108, NRDs have the first opportunity to deal with conjunctive use disputes (NRS §46-656.05(3)). In the case of interstate conjunctive use disputes, the DWR can establish groundwater regulations if NRDs regulations do not exist or are inadequate (NRS §46-656.05(5)).

NRD and DWR groundwater regulation options include: (1) groundwater allocations (i.e., quantity restrictions), (2) rotation in groundwater use, (3) well spacing requirements more restrictive than state law, (4) measuring devices (i.e., water meters), (5) reduction in irrigated acres, (6) mandatory Best Management Practices for water quality protection, (7) soil and water testing for fertilizer and chemical content, (8) voluntary or mandatory educational requirements, (9) water quality monitoring and reporting requirements, (10) well drilling moratoria, and (11) other necessary, reasonable rules and regulations (NRS §46-656.25(1), (7)).

Between its ability to protect water conducted in a stream and its ability to regulate wells to deal with conflicts involving hydrologically connected surface and groundwater in order to implement interstate agreements, the DWR has substantial authority to protect water released by Colorado or Wyoming to meet downstream habitat water requirements. However, these DWR authorities have yet to be implemented or legally tested in the interstate habitat protection context. Whether these authorities will prove to be sufficient to resolve all possible conflicts remains to be seen. If they prove inadequate, under the MOA Nebraska will propose legislation to remedy any defects (see Task W3-3 in Attachment I to Cooperative Agreement, States of Colorado, Nebraska, Wyoming and the Department of the Interior, May 1997).

EPA Middle Platte River Ecological Risk Assessment Program

The EPA's ecological risk assessment process has three components: (1) problem formulation/scoping, (2) analysis, and (3) risk characterization (EPA, 1992). The middle Platte River watershed was selected for inclusion in the EPA ecological risk assessment in 1993 because of, among other things, its national ecological importance (Jelinski and Currier, 1996, p. 4). A 1996 draft report on planning and problem formulation has been prepared (Jelinski and Currier, 1996). The draft report includes the environmental management goal developed by the risk assessment team: "Protect, maintain, and where feasible, restore biodiversity and ecological processes in the middle Platte River floodplain to sustain and balance ecological values with human uses" (Jelinski and Currier, 1996, p. 5).

Colorado Senate Bill 74 Planning Study

Colorado Senate Bill 96-074 passed the state Legislature in 1996. This legislation established a Special Water Committee composed of state legislators to study various water problems in the state of Colorado. Among these problems is the "need for and scope of participation, including financial participation by the state of Colorado and processes associated with the implementation of the Federal Endangered Species Act of 1973 as amended, with respect to the exercise of water rights associated with water resources in the South Platte River Basin and the Denver Basin." This investigation is scheduled for completion by June 1, 1997. Based on interviews with state officials, the State Engineer and the Director of the Colorado Water Conservation Board (who are directed to carry out this study) will rely on the ongoing MOA process involving the states of Colorado, Nebraska and Wyoming and the federal government to meet the requirements with respect to endangered species of Senate Bill 74.

Lower Platte Habitat Flows: An Intrastate Problem

Overview and Problem Description

The central Platte River's significance as wildlife habitat has previously been noted, as have efforts under federal law to dedicate a portion of the Platte's flow to habitat protection. Similar efforts have been made to acquire instream appropriations under Nebraska water law to dedicate a portion of the Platte's flow to habitat protection.

The Nebraska instream flow statute (NRS §46-2,108) authorizes both Natural Resource Districts (NRDs) and the Nebraska Game and Parks Commission (GPC) to acquire instream appropriations for fish, wildlife and recreation purposes. This creates a potential conflict regarding coordination of NRD and GPC instream appropriations because NRDs and the GPC may have different water management objectives. NRDs are often water project sponsors and thus might seek to minimize the quantity of water sought for an instream appropriation, if the instream appropriation competes with an NRD water project. The GPC, on the other hand, is Nebraska's wildlife management agency, and would be more likely to seek a higher quantity for instream appropriations to provide secure habitat protection, particularly if the habitat might be compromised by a future water project.

Regarding instream appropriation quantities, the instream appropriation statute specifies that the GPC or NRD may seek to appropriate "only the amount of water necessary for recreation or fish and wildlife" (NRS §46-2,108). The Nebraska Department of Water Resources (DWR) may grant the instream appropriation application, among other things, if "the rate and timing of the flow is the minimum necessary to maintain the instream use or uses for which the appropriation has been requested" (NRS §46-2,115(4)). The Nebraska Supreme Court has ruled that this language does not require instream appropriations quantities be limited to provide merely survival habitat and no more, but rather a flow rate that would maintain the existing habitat quality, even if that existing habitat quality were "optimum to outstanding" (In re: Application A-16642, 463 NW2d 591, 609-12 (Neb. 1990)). Thus, there is considerable room for interpretation and discretion regarding the quantity of an instream appropriation in Nebraska.

Efforts to Resolve the Problem

CPNRD Central Platte Instream Appropriations.—On July 25, 1990 the Central Platte NRD (CPNRD) filed six instream flow applications on the Platte River with the DWR. The instream appropriations were intended to

maintain river flows generally between Lexington and Columbus for five bird species. All of the species except the Sandhill Crane have been designated as threatened or endangered. The flows would either provide bird habitat in the Platte Valley or provide habitat for bird food sources. The amounts granted by the DWR on July 2, 1992 are indicated in Table 2. Some of the requested instream appropriations were denied by the DWR. The DWR noted that the CPNRD could have requested higher flows for Whooping Cranes because the CPNRD model indicated higher flows were justified to maintain existing habitat. However the DWR ruled that the CPNRD was bound by the lower amount requested, and that the DWR could not grant a greater flow than requested in an application.

The CPNRD instream appropriations were confirmed on appeal, although CPNRD was required to subordinate its senior (but now defunct) Prairie Bend II water project appropriations to the instream appropriations (*Central Platte NRD v. State of Wyoming*, 1 Neb App 974, 512 NW2d 392 (1993); *Central Platte NRD v. State of Wyoming*, 245 Neb 439, 513 NW2d 439 (1994)).

Table 2.—Central Platte River Instream Appropriations¹

Appropriation	Time period	Species	Reach	Flow (cfs)
A-17004a	Jan 1 - Jun 23	Terns/Plovers	J-2 Return ² -Columbus	500
A-17004b	Jun 24 - Aug 22			600
A-17004c	Aug 23 - Dec 31			500
A-17007b	Mar 1 - Mar 31	Sandhill Cranes	J2-Return-Columbus	1,100
A-17007c	Oct 1 - Oct 11			1,100
A-17008a	Apr 1 - Apr 14	Whooping & Sandhill Cranes	J2-Return-Grand Island	1,300
A-17008b	Apr 15 - May 3	Whooping Cranes	J2-Return-Grand Island	1,500
A-17008c	Oct 12 - Nov 10			
A-17009	Apr 1 - Apr 14	Sandhill Cranes	Grand Island-Chapman	1,500

¹ Nebraska Department of Water Resources, 1995, pp. 169, 176-77.

² The J-2 (Johnson-2) power return is located on the Platte between Lexington and Overton. Overton is the western edge of the critical Whooping Crane habitat.

GPC Platte Instream Appropriation Applications.—Subsequent to the CPNRD Central Platte River instream appropriations, the GPC applied for instream appropriations in the central and lower Platte River. The GPC instream appropriation applications are summarized in Table 3. Three of the appropriations, A-17329, A-17332 and A-17333, begin at the J-2 power return and thus overlap the CPNRD instream appropriations. The GPC requested flows are higher than those obtained by CPNRD.

The GPC central and lower Platte River instream appropriation applications were filed November 30, 1993 and were immediately protested by agricultural and irrigation groups. Numerous objections to the GPC instream appropriations were filed. The DWR held a prehearing conference September 23, 1994, and scheduled a hearing on the application for February 1995. At the prehearing conference the DWR concluded that if the GPC applications were granted, there would be no unappropriated water remaining in certain stream segments (Nebraska Department of Water

Table 3.—GPC Central and Lower Platte Instream Appropriation Applications¹

Application	Time Period	Species	Reach	Flow
A-17329a	Sep 16 - Jan 31	Least Tern, Piping Plover, Bald Eagle, River Otter, Pallid Sturgeon	J-2 to Loup Power Canal	1,000 cfs
A-17329b	Feb 1 - Jun 15			1,200 cfs
A-17329c	Jun 16 - Sep 15			
A-17330a	Sep 16 - Jan 31	Least Tern, Piping Plover, Bald Eagle, River Otter, Pallid Sturgeon	Loup Power Canal to Elkhorn River	2,400 cfs
A-17330b	Feb 1 - Jun 15			
A-17330c	Jun 16 - Sep 15			2,200 cfs
A-17331a	Sep 16 - Jan 31	Least Tern, Piping Plover, Pallid Sturgeon	Elkhorn River to Loup River	4,000 cfs
A-17331b	Feb 1 - Jun 15			5,800 cfs
A-17331c	Jun 16 - Sep 15			4,000 cfs
A-17332a	Apr 1 - May 10	Whooping Crane	J-2 Return to Grand Island	2,400 cfs
A-17332b	Oct 2 - Nov 10			
A-17333a	Feb 1 - Feb 28	Sandhill Cranes, Whooping Cranes, Geese, Ducks & Other Birds	J-2 Return to Chapman	3,100 cfs
A-17333b	Mar 1 - Mar 31			3,600 cfs
A-17333c	Apr 1 - Apr 30			3,200 cfs
A-17333d	May 1 - Jun 30			5,900 cfs

¹ Nebraska Department of Water Resources, 1995, p.11.

Resources, 1993-94 Biennial Report, pp. 4-5 (1995)). Consequently, the DWR informed applicants filing junior applications in the North Platte, South Platte, Platte, Loup and Elkhorn river basins that their applications would remain pending before the DWR, until a decision regarding the GPC instream appropriation applications had been made, unless the applicant was willing and able to prove that unappropriated water would be available for appropriation even if the GPC instream appropriation applications were granted. The 1995 Nebraska Legislature adopted legislation deferring the DWR's authority to grant new appropriations until January 1, 1997 (NRS §46-2,111).

Proposed Settlement.—Between late 1995 and early 1996, agricultural interests and three GPC commissioners attempted to negotiate a compromise whereby agricultural interests would withdraw their objections to the GPC instream appropriation applications if the GPC would reduce its flow

requests and make other concessions. The proposed settlement flows are presented in Table 4, along with the GPC staff recommended compromise flows. When terms of the proposed settlement were made public, the settlement was rejected 4-3 by the full GPC commission on July 19, 1996. The GPC then agreed to reduce its requested flows to the amounts recommended by GPC staff and to proceed with the DWR hearing. The DWR hearing on the GPC central and lower Platte instream appropriation applications is nearing completion and a DWR ruling on the applications is expected in late 1997 or early 1998.

1997 Legislative Changes.—In 1997 Nebraska instream flow statutes were amended to incorporate portions based on the unsuccessful GPC lower Platte instream appropriation application compromise. Major changes include:

1. The DWR must hold hearings on an instream appropriation every 15 years to determine whether the instream appropriation should be modified, canceled, or remain unchanged;
2. Instream appropriations must be conditioned not to interfere with induced groundwater appropriations for public water supply purposes and certain small uses and transfers;
3. Unappropriated water must be available at least 20% of the time during the period requested in order to be available for instream appropriations; and
4. Parties in new contested instream appropriation applications must complete mediation or non-binding arbitration before a contested case hearing may be held by the DWR on the instream appropriation application (1997 Neb. Laws, LB877).

The first three provisions apply to the GPC Lower Platte instream appropriation application pending before the DWR.

Table 4.—Settlement Flows and GPC Staff Recommended Flows¹

Application	Original	Settlement	Staff	CPNRD
A-17329a	1,000 cfs	600/525 cfs ²	1,000 cfs	500 cfs [A-17004c]
A-17329b	1,200 cfs			500 cfs [A-17004a]
A-17329c				725/650 cfs
A-17330a	2,400 cfs	1550/1400 cfs	1,800 cfs	-----
A-17330b		1300/1150 cfs		-----
A-17330c	2,200 cfs	1550/1400 cfs		-----
A-17331a	4,000 cfs	3100/2860 cfs	3,700 cfs	-----
A-17331b	5,800 cfs	2400/2160 cfs		-----
A-17331c	4,000 cfs	3000/2760 cfs		-----
A-17332a	2,400 cfs	1700/1625 cfs	2,400 cfs	1300/1500 cfs [A-17008a & b]
A-17332b		1500/1425 cfs	2,000 cfs	1100/1500 cfs [A-17007c & A-17008c]
A-17333a	3,100 cfs	525 cfs	2,700 cfs	-----
A-17333b	3,600 cfs		3,200 cfs	1100 cfs [A-17007b]
A-17333c	3,200 cfs	1625 cfs	2,800 cfs	1100 cfs [A-17009]
A-17333d	5,900 cfs	1625 cfs May	5,900 cfs	-----
		525-650 cfs Jun		

¹ Nebraska Game and Parks Commission, 1996.

² In the unsuccessful settlement agreement the GPC had agreed not to object to certain “de minimis” Junior appropriations up to 75 cfs in most cases. Thus, the two figures represent the gross GPC instream appropriation flow and the net flow with de minimis depletions included.

Central and Lower Platte Non-Point Source Agrichemical Pollution

Overview and Problem Description

The Platte River is the source of drinking water for much of Nebraska’s population. Omaha, Lincoln, Fremont, Grand Island and Kearney all rely upon wells located in the Platte River Alluvium for municipal drinking water supplies. In Kearney and Grand Island, Platte River flow also prevents high-nitrate groundwater from migrating into municipal well fields.

Nitrate and atrazine have become water quality concerns for lower Platte valley communities, particularly Lincoln and Omaha. Agricultural chemicals can contaminate municipal drinking water supplies in two ways: through

surface runoff and through base flow. Overland runoff carries excess agricultural fertilizer and pesticides into the Platte, where they can contaminate municipal supplies derived from the Platte alluvium. Nitrate and atrazine contamination of Platte valley groundwater supplies means that Platte River base flow is similarly contaminated. In the Lincoln and Omaha Platte River well fields, nitrate and atrazine contamination used to occur only when spring rains carried agricultural fertilizers and pesticides to the Platte River. Now, with nitrate and atrazine contamination of Platte base flow, these contaminants are present in Lincoln and Omaha municipal water supplies derived from the Platte year-round. During high levels of contaminant flows in the Platte River, Lincoln and Omaha water managers utilize wells most distant from the Platte in an attempt to dilute the effect of Platte River contaminants on municipal water supplies. Lincoln has also installed advanced water treatment to remove agricultural chemicals in the municipal water treatment process.

Efforts to Resolve the Problem

Agricultural chemical runoff into streams and deep percolation into groundwater supplies are treated as non-point sources of water contamination. As such, agricultural practices resulting in non-point contamination are not subject to direct regulation under the federal Clean Water Act. However, NRDs and the Nebraska Department of Environmental Quality (Nebraska DEQ) are authorized to regulate agricultural practices resulting in non-point contamination of groundwater. The Nebraska Department of Agriculture (NDA) is authorized to regulate pesticide use to prevent, among other things, non-point pollution of ground or surface water from pesticide use. At least two Platte valley NRDs have implemented fertilizer use restrictions to control nitrate contamination of groundwater, and all Platte Valley NRDs have adopted similar fertilizer regulations, which should be implemented in 1997. The NDA has submitted a draft generic state pesticide management plan (SMP), protecting groundwater supplies from pesticide contamination, to the EPA for its consideration and approval.

NRD Fertilizer Regulations.—The Nebraska Ground Water Management Act (now the Ground Water Management and Protection Act) was adopted in 1975. The focus of the 1975 law was to give local NRDs the option to regulate groundwater development and use to control groundwater depletion with DWR approval. The act was amended in 1982 to authorize NRDs to control groundwater depletion without being subject to direct DWR oversight through preparation of NRDs groundwater management plans. NRDs

regulations to protect groundwater from non-point pollution from agricultural chemical use were also authorized in the 1982 amendments. In 1986 the act was expanded to authorize Nebraska DEQ regulation to protect groundwater quality if agricultural chemical use threatened groundwater supplies and the local NRD had not taken appropriate action.

1991 amendment required all NRDs to prepare and implement groundwater management plans to protect groundwater quality from non-point pollution from agricultural chemical use. The required NRDs groundwater management plans were prepared by 1995, and are required to be implemented in 1997. The plans must be reviewed by the DWR. In reviewing NRDs management plans, the DWR determined that NRDs agricultural chemical regulations should be instituted before contaminant levels reached the EPA maximum contaminant levels (MCL). The NRDs management plans focus on fertilizer regulations to protect groundwater quality. Most NRDs are deferring pesticide regulations through NRDs groundwater management plans until NDA's generic state pesticide management plan has been approved by the EPA.

CPNRD Fertilizer Regulations.—The CPNRD is the first NRD to have adopted fertilizer use restrictions to protect groundwater quality. Because most NRD fertilizer regulations are modeled after the CPNRD's, the CPNRD fertilizer regulations will be presented first. Then fertilizer regulations for the remaining Platte Valley NRDs will be summarized.

The CPNRD is located in the intensively-irrigated central reach of the Platte River Valley. Soil and water tests from test plots in the high-nitrate areas of the NRD indicate that an average of 99-166 pounds of nitrate-nitrogen per acre are already available from soil and irrigation water, approximately 40-60 percent of the commercial fertilizer needed to grow corn.

The CPNRD fertilizer regulations vary depending on the severity of nitrate contamination. (The EPA drinking water limit for nitrates in public drinking water is 10 parts per million.) In Phase 1 Areas (average nitrate-nitrogen levels 0 - 12.5 ppm), application of commercial fertilizers is prohibited on sandy soils before March 1. Farmers are also encouraged to test soil and irrigation water for nitrogen levels to make better fertilizer use decisions. All of the NRD not located in a Phase 2 Area is in a Phase 1 Area; thus the Phase 1 Regulations apply within the entire CPNRD.

In Phase 2 Areas (average nitrate-nitrogen levels 12.6 - 20 ppm), application of commercial fertilizers is prohibited on sandy soils before March 1. Application on heavier soils after November 1 is allowed only if an approved

nitrogen inhibitor is also used. In addition, farmers must attend irrigation and fertilizer management training courses and receive nitrogen management certification. Finally, in Phase 2 Areas soil and irrigation water must be tested annually for nitrate-nitrogen content. The farmer must report annually on: (1) the water testing results for each irrigation well; (2) the soil testing results for each 40 acre tract; (3) the crop to be grown and the farmer's yield goal; (4) the NRD's commercial fertilizer use recommendation to accomplish the farmer's yield goal; (5) the actual commercial fertilizer applied; and (6) the actual yield achieved. Presumably if farmers are setting unrealistic yield goals and over fertilizing as a result, or do not take into account the nitrogen already available in the soil and irrigation, the reporting requirements will make this clear to the farmer and the NRD.

In Phase 3 Areas (average nitrate-nitrogen levels exceed 20.1 ppm), commercial fertilizer application on all soils before March 1 is banned. Spring applications of commercial fertilizer: (1) must be split (preplant and sidedress) application, or (2) must be applied with an approved inhibitor, if more than 50 percent is applied preplant. All other Phase 2 Regulations will apply.

Platte Valley NRD Fertilizer Regulations.—The North Platte, South Platte, Twin Platte, Tri-Basin, Lower Platte North, and Lower Platte South NRDs have all adopted fertilizer regulations as part of their groundwater management plan revisions. The Tri-Basin NRD has implemented fertilizer regulations similar to the CPNRD's since 1989, although with lower triggers.

Table 5 describes the Platte Valley NRD fertilizer regulation triggers. Most NRDs have three phases, with fertilizer regulations becoming more stringent as nitrate levels in groundwater increase. Each phase is typically triggered by crossing a groundwater contamination numeric threshold. The numeric thresholds vary considerably among NRDs, and are summarized in Table 5. The lower the trigger, the greater the likelihood that fertilizer regulations may keep contamination levels below the EPA nitrate maximum contaminant level (MCL) of 10 parts per million (ppm). The higher the triggers, the more likely that contaminant levels will exceed the MCL.

Table 5.—Platte Valley NRD Fertilizer Regulation Triggers¹
(values are nitrate concentrations in ppm)

NRD	Phase 1 Trigger	Phase 2 Trigger	Phase 3 Trigger
North Platte	Whole NRD	7.5	7.5 - 10

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South Platte	6.5	8	9.5
Twin Platte	7	8.5	10
Central Platte	Whole NRD	12.6 - 20	20.1
Tri-Basin	Whole NRD	Up to 9	If nitrate levels do not decline in 15 years
Lower Platte North	Whole NRD	88 - 10	> 10
Lower Platte South	Whole NRD	> 50% wells @ > 5	> 80% wells @ > 8

¹ Nebraska Department of Water Resources, 1996.

The Nebraska Groundwater Management and Protection Act authorizes NRDs to implement a variety of controls to deal with groundwater depletion or non-point groundwater contamination. NRD control authorities include: (1) groundwater allocations (i.e., restricting groundwater withdrawals), (2) rotation of use, (3) well-spacing, (4) flow meters, (5) Best Management Practices (BMPs), (6) soil and water analysis for fertilizer and chemical content, and (7) water quality education programs. BMPs may include irrigation scheduling, proper timing of fertilizer and pesticide application, and other fertilizer and pesticide management programs. Table 6 summarizes the fertilizer controls for phases 1, 2 and 3 for each Platte Valley NRD.

Section II - Critical Water Problems in the Platte River Basin

Table 6.—Platte Valley NRD Fertilizer Regulations¹

NRD	Phase 1	Phase 2	Phase 3
North Platte	Voluntary education ²	1 or more of: mandatory education, metering ³ , BMPs ⁴ , analysis ⁵	Same as Phase 2
South Platte	Mandatory education; voluntary BMPs	Mandatory BMPs, analysis; plus 1 or more of: scheduling ⁶ , metering	Mandatory education, BMPs, allocation ⁷ , metering, analysis; plus 1 or more of scheduling ⁸ , reduction ⁹
Twin Platte	Voluntary education, analysis, BMPs, metering, scheduling	Mandatory education, analysis, BMPs plus 1 or more of: metering, scheduling	Same as Phase 2 plus mandatory metering, allocation; plus 1 or more of: scheduling, reduction
Central Platte	Mandatory education, BMPs	Same as Phase 1 plus mandatory metering, analysis	Same as Phase 2
Tri-Basin	Voluntary education, mandatory BMPs	Mandatory education, BMPs, analysis	Same as Phase 2
Lower Platte North	Mandatory education, BMPs, analysis	Same as Phase 1 plus mandatory metering	Same as Phase 2
Lower Platte South	Voluntary education, BMPs, scheduling	Same as Phase 1 plus mandatory education	Mandatory education, BMPs, scheduling, analysis, plus 1 or more of: allocation, reduction, metering, spacing ¹⁰

Notes: ¹ Nebraska Department of Water Resources, 1996.

² education = educational programs

³ metering = well metering

⁴ BMP = best management practices

⁵ analysis = soil & water analysis for nitrate content

⁶ scheduling

⁷ allocation: limiting ground water withdrawals

⁸ scheduling = irrigation scheduling and/or rotation in pumping

⁹ reduction = reduction in acres irrigated

¹⁰ spacing = well spacing

Implementation of NRD fertilizer regulations should reduce overland runoff of nitrates into the Platte, and in time could reduce the level of nitrate contamination in Platte River base flows.

Pesticide Regulations.—The EPA regulates pesticide availability and use under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). States may administer federal FIFRA pesticide regulations if state pesticide programs meet the EPA requirements. The EPA is modifying its FIFRA pesticide regulations to emphasize groundwater quality protection. Under its Pesticides in Ground Water Strategy, the EPA requires states to prepare State Pesticide Management Plans (SMPs) as a condition for using pesticides

contaminating a state's groundwater (leachers). Leachers designated as such by the EPA cannot be sold or used in states not having an the EPA-approved SMP for that particular pesticide. In 1993 the Nebraska Legislature adopted the Nebraska Pesticide Act (NRS §2-2622 to 2665). The act authorizes the Nebraska Department of Agriculture (NDA) to administer the federal pesticide program in Nebraska, as well as prepare a SMP for the EPA Pesticides in Ground Water Strategy (NRS §92-2626(1), (2)).

The NDA is authorized by the Pesticide Act to designate pesticides as state limited use pesticides (SLUPS) and regulate their use either in designated areas or statewide. SLUPS may be designated if (1) the NDA determines that the pesticide poses a threat to human health and/or the environment, (2) the Nebraska DEQ or Nebraska Department of Health (NDH) water quality standards (discussed below) are violated, or (3) pesticide use restrictions beyond label directions are needed to meet state or federal pesticide restrictions. The NDA may limit or prohibit SLUP use, in limited geographic areas or state-wide (NRS §2-2626(2)).

The NDA is further authorized by the Pesticide Act to prepare a SMP regulating pesticide use to protect surface and groundwater quality. The Nebraska Department of Environmental Quality (Nebraska DEQ) establishes standards for pesticide levels in surface and groundwater and the NDH establishes standards for pesticide levels in drinking water. These standards will serve as “action levels” which, when reached, will trigger prevention and mitigation SMP regulations. The Nebraska DEQ and the NDH action levels may be less than the EPA drinking water standards (NRS §2-2626(2)).

The NDA has prepared a generic SMP to submit to the EPA for approval (Nebraska Department of Agriculture, Pesticides and Ground Water Generic State Management Plan, 1996). Under the EPA’s Pesticides in Ground Water Strategy, the EPA is encouraging states to prepare generic SMPs that will outline the state’s general approach regulating pesticide use to protect groundwater quality. Pesticide specific SMPs must be prepared and approved by the EPA for pesticides. An EPA approved SMP must be in place as a condition for pesticide use.

In the NDA proposed generic SMP, action levels are presumed to be 50% of the MCL for each pesticide. Action levels will be established by the Nebraska DEQ and the NDH for specific pesticides on a case by case basis. Under the proposed generic SMP, when water quality monitoring indicates that pesticide levels in water exceed the 50% MCL action level, the NDA would establish an advisory committee to review the groundwater management plan of the local NRD to determine whether additional

regulations are needed to prevent further pesticide water contamination. Advisory committee members would include: (1) the NRD where pesticides have been detected, (2) the NDH, (3) the Nebraska DEQ, (4) the NDA, (5) the Nebraska Natural Resources Commission, (6) the DWR, (7) the University of Nebraska Extension Service, (8) the U.S. Geological Survey, (9) the University of Nebraska Water Center, (10) the federal Natural Resources Conservation Service, and (11) the pesticide registrant (i.e., the company that manufactures the pesticide to be regulated).

Under the proposed generic SMP, pesticide regulations would include voluntary BMPs where the action level has not been exceeded. When an action level has been exceeded, the advisory committee will review the local NRD's groundwater management plan to determine its adequacy to deal with the pesticide contamination problem. Additional regulations that may be imposed by the NRD or the NDA include: (1) user training, (2) mandatory BMPs, (3) pesticide use restrictions beyond label directions, including (i) application rate, (ii) application method, and (iii) application timing; and (4) prohibition of pesticide use (moratorium). The NDA's preference under the generic SMP is to have pesticide regulations implemented by the local NRD working under its groundwater management plan rather than by the NDA. However, the NDA can regulate pesticide use directly, if need be. Implementation of the NDA and NRD pesticide regulations should reduce overland runoff of pesticides into the Platte, and in time could reduce the level of pesticide contamination in Platte River base flows.

Nebraska V. Wyoming

Overview and Problem Description

The *Nebraska v. Wyoming* litigation presents another example of a vehicle for resolving water resources management and water allocation problems in the Platte River basin. This litigation has primarily involved conflicts concerning construction of new diversion and storage projects in Wyoming, operation of the Bureau of Reclamation's North Platte Project, and groundwater development. Some attempt has been made to include the issue of flows for endangered species in Nebraska; however, whether or not the Court will accept these attempts by Nebraska to insert this issue in the case is yet to be decided.

The following overview of the *Nebraska v. Wyoming* litigation is presented in order to provide a summary of the issues involved in this matter. It is necessary to have some understanding of the issues that have been raised throughout the course of the ten years of litigation, in order to later analyze the efficiency of this vehicle for allocating and managing the waters of the

North Platte River. The overview is not presented as a legal summary of the litigation; such a summary is beyond the objectives of this report.

The waters of the North Platte River were apportioned by Decree in 1945 and modified in 1953. On October 6, 1986, the state of Nebraska petitioned the Supreme Court for an order enforcing the Decree and for injunctive relief. In this petition, Nebraska alleged that Wyoming was unlawfully depleting and threatening to deplete the flows of the North Platte River through:

1. Wyoming's intended administration of the operation and releases from Grayrocks Reservoir on the Laramie River, a tributary of the North Platte River,
2. Wyoming's intended construction of additional pumping and diversion of storage facilities near the confluence of the Laramie and North Platte Rivers,
3. Wyoming's proposed construction of a storage reservoir on Deer Creek, a tributary entering the North Platte River between Pathfinder and Guernsey Reservoir, and
4. Wyoming's efforts to prevent the United States Bureau of Reclamation's continued diversion of North Platte waters in Wyoming through the Interstate Canal for storage in the Inland Lakes in Nebraska.

Wyoming subsequently filed a counter-claim alleging that Nebraska was circumventing the Decree by:

1. Demanding natural flow water for diversion by irrigation canals at and above Tri-State Dam in excess of the irrigation requirements of Nebraska lands entitled to water under the Decree, and
2. Demanding both natural flow and storage water from sources above Tri-State Dam and bypassing or diverting it to uses below the dam that are not recognized or authorized by the Decree.

In his first interim report (June 14, 1989), the Special Master declined to grant the summary adjudication sought by Wyoming in connection with its counter-claim.

In January 1988, Nebraska moved to amend its petition for the principal purpose of enforcing the Decree and modifying the Decree if necessary to

protect instream uses of the North Platte River and its tributaries. Nebraska noted that (Nebraska, 1988):

Encouraged and sanctioned by the passage of Federal and State legislation since the entry of the Decree in 1945, the principal instream use of the waters of the North Platte and its tributaries has been for the development and protection of critical wildlife habitat.

The Supreme Court denied, without explanation, Nebraska's motion to amend.

1993 Supreme Court Decision

In its April 20, 1993 decision, the Supreme Court upheld the recommendations of the Special Master for the major issues raised in the 1986 petitions as amended and counter-claimed. The description below is provided to serve as a basis for tracing the resolution of the issues originally brought up in the Nebraska and Wyoming petitions and is not meant to serve as a legal summary of this Opinion.

Inland Lakes.—The Inland Lakes are four off-channel reservoirs in Nebraska served by the Interstate Canal, which diverts from the North Platte at Whalen, Wyoming. It appears that the Inland Lakes always have been operated with the December 6, 1904 priority date but that the Bureau of Reclamation never obtained a separate Wyoming storage permit for the Inland Lakes. In 1986, Wyoming sued the Bureau of Reclamation in Wyoming State Courts seeking to enjoin the Bureau from storing water in the Inland Lakes without a state permit and out-of-priority with other Wyoming users. There are some reasons to think that Wyoming wished to establish a post-1986 priority date for the Inland Lakes in order to increase the amount of North Platte water available for the new project on Deer Creek (*Nebraska v. Wyoming*, 507 U.S. 584 (1993)). The Special Master recommended that the Inland Lakes do have a priority of December 6, 1904 and this recommendation was upheld by the Supreme Court in their April 20, 1993 ruling (*Nebraska v. Wyoming*, 507 U.S. 584 (1993)).

This decision by the Supreme Court upholding the Special Master resulted in a situation that will help ensure that expected storage in the Inland Lakes will be approximately the same as in the past for comparable hydrological conditions. Consequently, Nebraska irrigators should be able to expect comparable releases of stored water in the future under similar hydrologic conditions to those occurring historically.

Grayrocks and Corn Creek Projects.—In its petition, Nebraska challenged two new developments on the Laramie River near the North Platte confluence: (1) the Grayrocks project, which was completed in 1980, and (2) the Corn Creek project, a proposed irrigation system.

Wyoming and Nebraska both moved for summary judgment, taking opposite positions with respect to their rights to Laramie River water. Nebraska's argument was that it would be injured if Wyoming interfered with minimum releases by Basin Electric to the Laramie River by allowing new Wyoming appropriators to divert from the Laramie between Grayrocks and the North Platte confluence. In a similar manner, Nebraska argued that it would be injured if Wyoming permitted development of the Corn Creek project, which would divert water from the Laramie River. In its 1993 decision, the Court did not resolve this question concerning proposed new diversions by Wyoming from the Laramie River.

Deer Creek.—Deer Creek enters the main stem of the North Platte in Wyoming between Pathfinder and Guernsey Reservoirs, upstream of the Pivotal reach. The Pivotal reach is the reach of the North Platte River between Whalen Diversion Dam and the Tri-State Diversion Dam at the Nebraska/Wyoming border. The Pivotal reach is a key item in the 1945 Decree apportioning the waters of the North Platte River between the two states in that flows in the Pivotal reach are allocated on a 25:75 percent basis between Wyoming and Nebraska, respectively. Nebraska's petition challenged Wyoming's proposed construction of a new storage reservoir in Deer Creek. In its April 20, 1993 opinion, the Supreme Court did not resolve this matter of Deer Creek.

In its counter-claim Wyoming alleged that Nebraska was violating the Decree by demanding natural flows of storage water from sources above the Tri-State Dam and diverting those waters to uses below Tri-State that are not recognized in the Decree. Wyoming also alleged that Nebraska was improperly demanding North Platte flows for diversion by canals at and above Tri-State in excess of the irrigation requirements of Nebraska lands entitled to water above the Decree. Increased diversions by the Nebraska canals above Tri-State evidently benefit users below Tri-State because they create increased return flows.

The Court agreed with the Special Master that most of these claims were "too theoretical and not sufficiently anchored to concrete pleadings or an adequately developed factual record" to be susceptible as summary resolution at this time. The Court also agreed with the Special Master and ruled that

the Decree did not impose absolute ceilings on diversions by canals taken in the North Platte River's "Pivotal reach."

May 30, 1995 Supreme Court Opinion

Nebraska and Wyoming sought to amend their pleadings and the Supreme Court referred these requests to the Special Master. Nebraska filed an Amended Petition that contained four counts and Wyoming subsequently filed four counter-claims and five cross-claims. Nebraska's counts in their Amended Petition and Wyoming's counter-claims and cross-claims are discussed below together with the present situation involving disposition of these counts, counter-claims and cross-claims in the May 30, 1995 Supreme Court Opinion. Again, the purpose of this discussion is not to present a complete legal analysis, but rather to provide basic information concerning the nature and extent of these claims in order to allow for subsequent analysis of the apparent effectiveness and efficiency of the *Nebraska v. Wyoming* litigation for resolving water resource allocation and management conflicts in the *Nebraska v. Wyoming* litigation. The following discussion should, by no means, be considered a detailed legal analysis.

Amended Nebraska Petition.—The Nebraska Amended Petition contained four counts.

- **Count I** alleged that Wyoming is depleting the natural flows of the North Platte and asked for an injunction against constructing storage capacity on the river's tributaries and permitting unlimited depletion of groundwater that is hydrologically connected to the North Platte and its tributaries including Horse Creek. The Special Master recommended that Count I of Nebraska's Amended Petition be accepted and the Supreme Court agreed with the Special Master. Therefore, depletion of natural flows on the North Platte by constructing additional storage capacity in Wyoming on the tributaries and the depleting effects of groundwater development will still be considered in the case.
- **Count II** alleged that the United States is operating the Glendo Reservoir in violation of the Decree and seeks an order holding the United States to the Decree. The Special Master recommended that Count II be accepted and the Supreme Court agreed. Therefore, Glendo Reservoir operation will be considered further in the case.
- **Count III** alleged that Wyoming water projects and groundwater development threaten to deplete the Laramie River's contribution to the North Platte and asked the Court to specify that the inflows of the

Laramie River below Wheatland are a component of the equitable apportionment of the natural flows in the Pivotal reach, 75 percent to Nebraska and 25 percent to Wyoming, and to enjoin Wyoming from depleting Nebraska's equitable share of the Laramie River's contribution to the North Platte River. The Special Master recommended acceptance of Count III and the Supreme Court agreed. Therefore, the litigation will still consider the effects of proposed groundwater and surface water development on the Laramie River and potential injury to Nebraska as a result of this development.

- **Count IV** seeks an equitable apportionment of the North Platte's non-irrigation season flows. The Special Master recommended that leave be denied to file Count IV. The Supreme Court accepted this recommendation and this topic will not be considered.

Wyoming's Four Counterclaims And Five Cross-Claims.—Wyoming's Counterclaims and Cross-Claims include:

- **First Counterclaim and Cross-Claim** alleged that Nebraska and the United States failed to recognize beneficial use limitations on diversions by Nebraska canals, and that Nebraska violated the equitable apportionment by demanding natural flow and storage water from sources above Tri-State Dam and diverting them for use below Tri-State Dam. The Special Master recommended that Counterclaim I and Cross-Claim I be denied and the Supreme Court supported the Special Master.
- **Wyoming's Second and Third Counterclaims and Cross-Claims** seek enforcement and modifications of Paragraph XVII of the decree that deals with the operation of Glendo Reservoir. (This is also the subject of Count II of Nebraska's Amended Petition.) The Special Master recommended approval of Wyoming's Second and Third Counterclaims and Cross-Claims.
- **Wyoming's Fourth Counterclaim and Fifth Cross-Claim** asks the Court to modify the decree to leave the determination of carriage losses to state officials under state law. The Special Master recommended approval of the Fourth Counterclaim and Fifth Cross-Claim and the Supreme Court agreed.
- **Wyoming's Fourth Cross-Claim** alleges that the United States has failed to operate its storage reservoirs in accordance with federal and state law and its own storage water contracts thereby upsetting the very basis of the decree's equitable apportionment. The Special

Master recommended approval of Cross-Claim Four and the Supreme Court agreed.

Wildlife Issues.—Wyoming’s second exception to Counts I and III of Nebraska’s Amended Petition took issue with the Master’s stated intention to consider a broad array of downstream interests in passing on Nebraska’s claims, and to hear evidence of injury not only to downstream irrigators, but also to wildlife and wildlife habitat. Wyoming argued that consideration of evidence concerning injury to wildlife and wildlife habitat in the central Platte reach of the Platte River would run counter to the Supreme Court’s denial of two earlier motions to amend that were filed by Nebraska. Wyoming also argued that allegations of injury to wildlife are purely speculative and would be best left to other forums. The Supreme Court indicated that Wyoming’s arguments were not persuasive and agreed to allow Nebraska the future opportunity for presenting evidence of injury to wildlife and wildlife habitat in the Big Bend reach (115 S. Ct. 1933, pp. 6-7). Therefore, it appears that while the issue of administering the Platte River in order to provide flows for the endangered species wildlife in the central Platte reach is not yet specifically included in the various conflicts argued in *Nebraska v Wyoming*, the Supreme Court in its 1995 opinion left the door open for Nebraska to come forward with evidence supporting injury to the wildlife and wildlife habitat in the central Platte reach as a result of projects proposed for development in Wyoming such as the Deer Creek project.

These “wildlife habitat” claims by Nebraska remain a point of controversy in the establishment of the Cooperative Agreement for establishing a recovery program for Platte River endangered species (see Memorandum of Agreement section herein).

The recent agreement in principle on the Cooperative Agreement may have partially resolved some of the controversies involving linkage between *Nebraska v. Wyoming* and the establishment of a recovery program for endangered species on the Platte River. One of Colorado’s key concerns has been the inter-relationship of the litigation in *Nebraska v. Wyoming* with the Cooperative Agreement and the Proposed Program. To resolve this issue, the parties have agreed that: (1) any party may withdraw or seek renegotiation of the Program Amendment based on the outcome of the litigation, (2) if any party withdraws, Fish and Wildlife Service will reinitiate ESA consultation on all permits that have relied on the Cooperative Agreement and (3) the litigation is in an appropriate forum to establish specific flow requirements for the habitat. Moreover, Nebraska will not assert positions adverse to the other states, or water users in those states, on issues related to the listed species, or their habitat, in other judicial or administrative proceedings so

long as the Agreement or Program is in effect (States of Colorado, Nebraska, Wyoming and the Department of the Interior, May 1997).

Front Range Water Supply Needs

Overview and Description of the Problem

In 1982 the Denver Water Board and 41 municipal water supply entities signed the Metropolitan Agreement, and a further 1984 South Platte Agreement to pursue the Two Forks project. The agreements sought to coordinate efforts to meet the water supply needs for an expanding front range population. Between 1982 - 1988 approximately \$40 million was spent on the Two Forks environmental impact statement and related project development (*Alameda Water & Sanitation Dist v. Reilly*, 930 F. Supp 486, 488 (D. Colo. 1996)).

The Two Forks Reservoir project was a proposed 1.1 million acre-feet reservoir on the South Platte River, approximately one mile below where the North Fork of the South Platte River joins the South Platte River. Two Forks would have provided long-term storage from the North Fork and the South Platte River. It would also have stored water from existing west slope water collection systems, which deliver water to the North Fork through the Roberts Tunnel. Operation of Two Forks was estimated to increase the annual firm yield to the Denver water system by 98,000 acre-feet, enough to meet the anticipated demand for the Denver metropolitan area for 33 years (930 F. SUPP at 488).

The Two Forks §404 permit application was filed April 4, 1986. In March 1988 the Corps issued its final EIS (FEIS). On May 26, 1988 the EPA submitted comments on the FEIS indicating that the EPA felt Two Forks was the most environmentally damaging of the alternatives considered. On March 15, 1989 the Corps filed a notice of intent to issue the §404 permit for Two Forks. The EPA then indicated its intent to veto the §404 permit under §404(c) of the Clean Water Act. The EPA issued a proposed determination veto for the Two Forks §404 permit on August 29, 1989. The Two Forks §404 permit was vetoed by the EPA on November 23, 1990, based on what the EPA termed unacceptable adverse effects on fisheries and recreational areas and the availability of less environmentally damaging practicable alternatives to Two Forks (930 F. SUPP. at 489-90). The EPA Two Forks veto was sustained by the U.S. District Court for the District of Colorado on June 5, 1996 (*Alameda Water & Sanitation Dist v. Reilly*, 930 F. SUPP 486 (D. Colo. 1996)).

With the demise of Two Forks Reservoir, municipalities in the Colorado front range area have been faced with a need for alternative water supplies. This search for alternative water supplies has generally not involved federal agencies, policies, or programs with the exceptions of: (1) regulatory requirements for the threatened and endangered species, and (2) the regulatory requirements associated with renewal of existing Special Use Permits on federal land for water storage and diversion facilities.

Efforts to obtain future water supplies have involved the Denver Water Board's Integrated Resource Plan (IRP), the Colorado Department of Natural Resources' Metropolitan Water Supply Investigation and numerous projects by individual municipalities and water districts. Efforts to maintain instream flows in the South Platte River through the Denver metropolitan area by the Denver Water Board and the Farmers Reservoir and Irrigation Company (FRICO) have been implemented in order to provide water supply for other than municipal use. Therefore, significant efforts are under way to resolve front range water supply problems. These efforts are discussed below.

Denver Water Board's Integrated Resource Plan

The Denver Water Board has recently completed its Integrated Resource Plan to develop a long range plan for water supply for the area served by the Denver Water Board. Work to date has indicated that at full build-out conditions for the existing Denver Water service area, an annual supply of approximately 445,000 acre-feet will be required as compared to the existing supply of approximately 345,000 acre-feet. This approximately 100,000 acre-foot difference has been the subject of an investigation of numerous alternatives including system refinements, conservation, nonpotable reuse, conjunctive use, enlargement of existing dams and building new reservoirs and collection systems.

In October 1996, the Denver Water Board directed its staff to explore possible cooperative actions with the other water suppliers outside Denver's service area and report back to the Board in two years. This effort is in addition to the Board's direction to staff to begin implementing its near-term water resource strategy for serving the water needs inside its service area. This has resulted in a two year program to report back to the Water Board, by September 1998. This effort has tended to merge with the Metropolitan Water Supply Investigation (MWSI) that was started by the Colorado Department of Natural Resources in 1993. The MWSI and the Denver Water Board's IRP share many of the same goals.

Metropolitan Water Supply Investigation

Governor Roy Romer created the Front Range Forum by executive order on October 6, 1993. The Forum's purpose is to create a policy environment in which to conduct technical investigations of cooperative water supply strategies for the Denver metropolitan areas. The Forum consists of elected officials, water supply agency managers, and other community leaders. The participants are from the Denver metropolitan area, other front range communities, and the western slope.

The Front Range Forum initiated the Metropolitan Water Supply Investigation in order to determine ways in which Denver metropolitan water supply agencies can work together to enhance available water supplies for the metropolitan area. This investigation comes at a critical time with major portions of the southeastern metropolitan area totally dependant upon non-replaceable groundwater from the Denver basin, while at the same time experiencing water tap growth rates in excess of 5 percent per year.

The four major alternative water supplies currently being considered in the MWSI include:

- **Conjunctive Use**, which is defined as the coordinated use of surface and groundwater so as to use both resources more efficiently than could otherwise be attained from separate independent use.
- **Effluent Management**, which is the development of multi-party effluent management plans to directly or indirectly increase regional metropolitan water supplies while complimenting water quality compliance efforts. The Denver metropolitan area has substantial quantities of reusable effluent available because this effluent comes from trans-mountain sources and is, consequently, fully consumable water.
- **Interruptible Supply Arrangements**, which include the potential for voluntary, compensated short term transfers of water supplies to municipal needs that can increase municipal system reliability without permanent reallocation of water use.
- **Systems Integration**, which involves operationally or physically linking existing water supplies to increase or more fully use regional water supplies.

Work to date in the MWSI has resulted in substantial reports on these alternatives which, in turn, provide data sources for making decisions.

Bypass Flow Issues

The by-pass flow issue involves the authority of federal agencies to impose conditions on holders of special use permits (SUPs) for the private use of federal land. The by-pass flow issue is included in this report because of its potential effects on front range cities and towns seeking renewal of SUPs from the Forest Service for existing diversion and storage facilities located on national forest land. The by-pass flow issues will be discussed primarily from this more narrow, local viewpoint rather than the more general and legal viewpoint of the authority of federal agencies to impose restrictions on SUPs. Nevertheless, some understanding of the broader concerns must be included.

Relevant History: By-Pass Flows.—The history of federal involvement in the by-pass flow issue centers on the ability of the Forest Service to condition land use authorizations for the use of federal lands by private parties for water diversion facilities located on public lands. In Colorado the by-pass flow issue involved the renewal by the Forest Service of SUPs for water storage facilities in the Arapahoe and Roosevelt National Forests. The Forest Service proposed by-pass flows in stream reaches below the water storage facilities as a condition of SUP issuance.

In June of 1979, Department of the Interior Solicitor Krulitz summarized the legal opinions related to the Non-Reserved water rights issue up until that time. Solicitor Krulitz opined that Department of the Interior agencies were entitled to appropriating water for purposes stipulated by Congress whether or not these purposes were tied to specific land reservations. In January of 1981, Department of the Interior Solicitor Martz issued a supplemental opinion regarding federal Non-Reserved water rights. Martz stated that the Department of the Interior agencies can reserve water that is unappropriated for federal purposes when it is not inconsistent with state laws.

In September of 1981, Department of the Interior Solicitor Coldiron issued an opinion referring to several precedent setting cases in judicial history which dealt with the issue of federal versus state rights as they applied to water appropriation. The Coldiron opinion stated that the federal agencies who have interest in appropriating water for their uses have no special rights to the water over those available to them in state law for appropriation. In 1982 a summary paper and opinion was provided by Theodore Olson, Assistant Attorney General, Office of Legal Council to Carol Dinkins, Assistant Attorney General, Land and Natural Resources Division. The Dinkins Memorandum stated that in the absence of specific congressional intent (such as at Indian Reservations), federal agencies should defer to state water law for the purpose of water appropriation.

James C. Overbay, Deputy Chief, National Forest Service wrote a memo to John H. Bueter, the acting Assistant Secretary, NRE. This memo stated the importance of maintaining instream flows or by-pass flows in stream beds within the national forest boundaries for the purpose of providing a reasonable level of resource protection.

In April 1992, Mr. Skip Underwood, Forest Supervisor, Arapahoe and Roosevelt National Forest, sent a letter to Mr. Frank Stephens, Director of Water and Sewer Department, City of Greeley. This letter outlined the authorization of the Forest Service to require EISs and by-pass flows as part of SUPs for facilities in the Forest Service boundaries.

As a result of these conditions placed upon SUP issuance in the Arapahoe and Roosevelt National Forests, Senator Hank Brown of Colorado and other congressmen urged the then Secretary of Agriculture, Edward R. Madigan, to facilitate the permitting of water supply facilities within the National Forest boundaries without the constraints of by-pass flows. Secretary Madigan wrote a letter to that effect in October of 1992. In these directives Secretary Madigan stated that environmental goals within the Forest Service could be achieved without the unwarranted taking of water rights.

Following the issuance of the Madigan memo, Congress considered codifying the substance of the Madigan memo. This effort being unsuccessful, a task force was created to study the by-pass flow issue further. This task force's creation was required by public law P.L. 104-127. The legislation had two main facets related to the by-pass flow issue: imposition of a moratorium on by-pass flow requirements and the creation of a task force consisting of seven members appointed by Congress and the Secretary of Agriculture. The task force was charged with finding solutions to the by-pass flow controversy.

Colorado Front Range By-Pass Flow Controversy And Resolution.—The recent controversy, which developed over by-pass flow requirements for streams in the Arapahoe and Roosevelt National Forests began in 1991. At that time the SUPs that had previously been issued by the Forest Service for water users and their storage facilities within the forest boundaries came up for renewal. The Forest Service required that for renewal of the SUPs, flows of sufficient quantity to support the aquatic habitat in streams downstream from the water storage facilities be passed by the facilities. This condition was a source of contention between the Forest Service and the water users. As negotiations between the Forest Service and the water users continued, but did not progress, the U.S. Fish and Wildlife Service initiated a Section 7 consultation involving the new permitting associated with the water storage and/or diversion facilities. The Section 7 consultation was related to

Endangered Species Act considerations downstream in the Platte basin. As a part of the Section 7 consultation, the FWS was required to provide a Biological Opinion on the likely impact of the water storage facilities' continued operation in the forest on endangered species in Nebraska.

The water users that were contesting the new conditions for issuance of the SUPs were grouped together. This group included the cities of Thornton, Greeley, Fort Collins, Boulder, Public Service Company and others. Upon completion of their Draft Biological Opinion, FWS stated that there were impacts on the endangered species in Nebraska as a result of water storage within the national forest. As a result of this determination, the FWS gave its judgment on the Reasonable and Prudent Alternative. The Reasonable and Prudent Alternative stated that if storage or diversion took place in these facilities, releases of amounts equal to the storage quantities would have to take place at the Colorado-Nebraska state line. In addition, cash payments would have to be made to the FWS by the various communities of water users.

Since the water users were not amenable to these conditions for obtaining their SUPs within Forest Service lands, they agreed to join in negotiations between the three states of Colorado, Wyoming and Nebraska and the United States Department of the Interior on the Basin Recovery Program (BRP) for the Platte River basin. As these negotiations progressed under the auspices of the Memorandum of Agreement proceedings, a parallel negotiating effort was begun between the water users and the Forest Service, specifically concerning the by-pass flows within the Arapahoe and Roosevelt National Forests.

Prior to issuing new special use permits for these diversion and/or storage facilities, the Forest Service was required to comply with NEPA, which required that Environmental Impact Statements (EIS) and Environmental Assessments (EA) be performed in support of the application for SUPs. Following the development of these documents, the individual members of the water users group began negotiating with the Forest Service for the rights to make inter-basin exchanges in order to fulfill the by-pass flow requirements. Using information from the Colorado Department of Wildlife, it was determined that the single biggest problem was low winter base flows. Recognizing this priority, Joint Operating Plans (JOP) were developed between the various water users and the Forest Service. Following these negotiations and document preparations, occupancies were granted through SUPs with twenty year lives and fifty year easements.

A lawsuit has been brought against the Forest Service by Trout Unlimited, which contends that the Forest Service is not properly administering their

forest management plan by not requiring by-pass flows immediately downstream from one water storage facility owned by the Water Supply and Storage Company. This lawsuit will determine whether or not the Forest Service was arbitrary or capricious in not requiring instream flows below this one facility.

Allard/Brown Task Force on Resolution of By-Pass Flow Issues.—The controversy that ensued as a result of these new special use permit requirements for diversion and storage requirements on National Forest land resulted in an amendment to Public Law 104-127, the 1996 Farm Bill, that was sponsored by Representative Wayne Allard and Senator Hank Brown, both of Colorado. This bill imposed an interim moratorium on by-pass flows requirements related to the renewal or reissuance of the SUPs for 18 months. During this 18-month period a study of the by-pass flow issue would be carried out by a water rights task force. During the study period the Forest Service will extend, as needed, any expiring SUPs in order to incorporate the results of this study authorized by P.L. 104-127. The legislation also established a task force of seven people appointed by various members of the House and Senate and the Secretary of Agriculture.

Several specific items are to be studied by the task force. These items include:

1. Whether federal water rights should be acquired for environmental protection on Forest Service land;
2. Any measures that might be necessary to protect the free exercise of non-federal water rights requiring easements and permits from the U.S. Forest Service;
3. Protection of minimum instream flows for environmental and watershed management purposes on National Forest land through purchases or exchanges from willing sellers in accordance with state law;
4. Effects of any of the recommendations by this study on existing state laws, regulations and customs of water usage; and
5. Any measures that would be useful in avoiding or resolving conflicts among: (a) the Forest Service responsibilities for resource and environmental protection, (b) public interest, and (c) property rights of water holders with SUPs for water facilities.

One year after the implementation of this law, the task force was to provide a final report to the Secretary of Agriculture, congressional leadership, and appropriate committees of the House and Senate.

This legislation and the by-pass task force were reportedly created to deal with the permitting of special uses on Forest Service lands and not necessary to deal with the endangered species in the central Platte. The main connection between the by-pass flow issue and the Endangered Species Act is related to the negotiations that took place between the Forest Service and the various water users concerned with the by-pass flow issue in the northern front range area of Colorado. The Forest Service asked the FWS for an evaluation of the effects of by-pass flows on endangered species. Therefore, the FWS considered the impacts of by-pass flows on endangered species in the central Platte in Nebraska.

Local Watershed Case Study: The Central Platte Natural Resources District

The Central Platte Natural Resources District (CPNRD) provides a microcosm of evolving local and national attitudes toward natural resources, groundwater, and surface water. Natural resource districts (NRDs) were established in Nebraska to deal with resource problems and concerns on a broader watershed basis. The CPNRD is an example of the local-control NRD philosophy at work: CPNRD has been aggressive in attempting to deal with both groundwater depletion and groundwater quality protection.

Regarding groundwater depletion, CPNRD has attempted to follow a traditional approach by developing a supplemental water supply surface impoundment project to avoid restricting local irrigator groundwater development and/or use. In pursuing the “rescue project” alternative, CPNRD has been required to cope with emerging environmental priorities placing a greater value on habitat protection than upon resource development and use. While the CPNRD has creatively attempted to accommodate both habitat protection and resource development objectives, its water development attempts have failed.

The other major resource management issue the CPNRD has addressed is non-point pollution of groundwater. CPNRD has been a national leader regarding control of nitrate contamination from fertilizer use in agriculture

(Schneider 1990). CPNRD has not yet attempted to deal with pesticide contamination, waiting for a long-standing state policy debate regarding pesticide regulation to be resolved. Public concern regarding drinking water protection has focused attention on non-point source contamination of groundwater in Nebraska and the Platte Valley, and is likely to be a catalyst for continuing efforts to control non-point contamination of groundwater.

Natural Resource Districts

In most states, county soil and water conservation districts were established in the 1930s to deal with local conservation issues, as well as meet federal farm program conservation requirements. In 1969 the Nebraska Legislature adopted legislation to combine 154 special purpose districts into 24 natural resource districts (NRDs) (NRS §2-3201 et seq). The original 24 NRDs, which are unique to Nebraska, were established in 1972. A 1989 merger reduced the number of NRDs from 24 to 23. Organized along river basin lines, Nebraska's NRDs deal with a wide range of natural resource programs, including water quality, water supply, flood control, soil conservation, habitat protection, and outdoor recreation.

The NRDs basic purposes are soil and water conservation, including flood control and erosion control (NRS 2-3229). NRDs also have important ground-water management responsibilities, including: groundwater management areas (groundwater depletion control and/or pollution prevention) and chemigation regulations (NRS §46-657.01 et seq; -1101 et seq). NRDs may also develop water supply projects for irrigation or rural water supply purposes (NRS §2-3257 et seq). NRDs have outdoor recreation authorities, and may obtain instream appropriations (NRS §2-3290, 46-2,108).

NRDs are governed by a locally elected board of directors (NRS §2-3214). The board typically meets once a month, and hires NRD staff. The board must have between 5-21 members (odd number required), and members serve four year terms (NRS §2-3213(a), -3214). Directors can be elected at large or by subdistrict. Directors can also be nominated by subdistrict and elected at large. How directors are nominated and elected is determined by each NRD. If directors are nominated and/or elected by subdistrict, subdistricts may vary in size by 300% (3-1) (NRS §2-3214(2)). That is, the largest subdistrict (based on population) may be no more than three times the population of the smallest subdistrict. Each NRD is to strive to have subdistricts be substantially equal in population. The subdistrict approach may be used to give rural areas of the NRD greater representation on the

NRD board than their population would warrant on a one-person, one-vote basis. Most NRD directors are farmers or ranchers; many are irrigators.

NRDs are funded by a property tax of 4.5 cents per \$100 valuation (NRS §2-3225). The NRD can also levy additional amounts for particular programs, including groundwater management areas (NRS §46-656.34). If an NRD has established a water project (e.g., irrigation project or rural water supply project), the NRD may charge for any water provided to customers as well as establish a property tax for the general area benefited from the water project (NRS §2-3252 et seq). NRDs may issue bonds (e.g., revenue bonds from a water project) if 2/3 of the board approves (NRS 2-3226).

Groundwater Depletion

The Central Platte Valley is one of the more intensively irrigated areas in Nebraska. Under the Nebraska Ground Water Management and Protection Act, NRDs may deal with groundwater depletion through regulations identified in NRD groundwater management plans (NRS §46-656.01 et seq). NRD groundwater regulatory options include: (1) groundwater allocations (i.e., quantity restrictions), (2) rotation in groundwater use, (3) well spacing requirements more restrictive than state law, (4) measuring devices (i.e., water meters), (5) reduction in irrigated acres, (6) mandatory Best Management Practices for water quality protection, (7) soil and water testing for fertilizer and chemical content, (8) voluntary or mandatory educational requirements, (9) water quality monitoring and reporting requirements, (10) well drilling moratoria, and (11) other necessary, reasonable rules and regulations (NRS §46-656.25(1)). NRDs are required to prepare groundwater management plans; but are only required to implement groundwater management plans to protect groundwater quality (NRS §46-656.16). Thus, regulations to control groundwater depletion are an NRD option (Aiken, 1980, pp. 992-95). CPNRD has prepared a groundwater management plan dealing with groundwater depletion, which requires irrigators to reduce the number of acres irrigated as groundwater levels decline. Acreage reduction regulations have yet to be triggered by groundwater level declines.

One factor making NRDs more reluctant to regulate groundwater depletions by local irrigators has been the hope that a surface water project may be developed to provide a supplemental water supply to groundwater irrigators (Aiken, 1987, pp. 43-48). CPNRD has been particularly aggressive in developing rescue project proposals. The first proposed project (which

predated the CPNRD, but was supported by CPNRD) was the Mid-States project, a Bureau of Reclamation project that would have irrigated 140,000 acres (Nebraska Soil and Water Commission, 1971, pp. 168-69). However, Mid-States was defeated in a public referendum in 1975 (Aucoin, 1984, p. 56).

CPNRD then supported a successor to the Mid-States project, the Prairie Bend project (Kuzelka and Flowerday, 1993, p. 123). However, development of Prairie Bend was complicated by changing state and federal policies toward water development and the environment (Aiken 1987, pp. 22-53). The 1969 National Environmental Policy Act, the 1973 federal Endangered Species Act and the 1975 Nebraska Endangered Species Conservation Act all established new environmental planning and protection requirements for federal projects, including Bureau water projects. The 1978 *TVA v. Hill* decision, in which construction of the Tellico Dam was halted to protect the habitat of the endangered snail darter, convincingly demonstrated that a new era in resource management had begun (437 US 153 (1978)). The snail darter decision was mirrored in Nebraska when development of the proposed Catherland project to divert Platte River water to irrigated land in the Blue River Basin was stopped to comply with endangered species requirements (*Little Blue NRD v. Lower Platte North NRD*, 317 NW2d 726 (Neb 1982)). In this case the Nebraska Supreme Court ruled that the DWR was required to consider the effects of Catherland on the central Platte critical habitat designated by the FWS on May 15, 1978 (50 CFR §17.95(b)). The Catherland project was ultimately terminated on other grounds (In re Applications A-15145, A-15146, A-15147, and A-15148, 433 NW2d 161 (Neb 1988)).

The Mid-States project was resurrected as the new Prairie Bend project soon after the Mid-States project defeat at the polls in 1975. Prairie Bend's primary sponsor was the Central Nebraska Conservation Association (CNCA). The DWR approved the Prairie Bend applications in 1979, and CNCA received appropriation extensions from the DWR from 1979-1989 (In re Applications A-14138A, A-14138B and A-14139, 480 NW2d 709, 710-713 (Neb 1992)). In 1984, in response to the 1982 Catherland endangered species decision, the DWR ordered CNCA among other things to obtain a biological opinion from the GPC to determine whether Prairie Bend would harm endangered species habitat in violation of the Nebraska Endangered Species Conservation Act (480 NW2d at 711). The GPC issued a jeopardy opinion in 1989 (480 NW2d at 711-712). On March 4, 1991 the DWR dismissed the Prairie Bend appropriations, and the dismissal was approved by the Nebraska Supreme Court (480 NW2d at 713, 715-16).

CPNRD then began development of the Prairie Bend II project. CPNRD sought to avoid the environmental problems that had helped defeat Prairie

Bend I by obtaining instream appropriations to protect endangered species in the central Platte River. These instream appropriations have already been discussed. The CPNRD instream appropriations were granted by the DWR on July 2, 1992. The CPNRD instream appropriations were confirmed on appeal, although CPNRD was required to subordinate its senior Prairie Bend II appropriations to the instream appropriations (*Central Platte NRD v. State of Wyoming*, 1 NebApp 974, 512 NW2d 392 (1993); *Central Platte NRD v. State of Wyoming*, 513 NW2d 439 (Neb 1994)). The Nebraska Supreme Court ruled that the Prairie Bend II appropriations, if perfected, could interfere with the instream appropriations and that the DWR could not grant the instream appropriations until the Prairie Bend II issue had been resolved (513 NW2d at 855-57).

After obtaining instream appropriations for endangered species and subordinating its unperfected Prairie Bend II appropriations to those endangered species instream appropriations, CPNRD then pursued Prairie Bend II. The DWR dismissed the Prairie Bend II appropriations, in part, because the project would jeopardize the endangered species that the CPNRD instream appropriations were designed to protect due to dam location (*CPNRD v. City of Fremont*, 549 NW2d 112, 115-16 (Neb 1996)). Thus while the CPNRD efforts were a noteworthy attempt to accommodate both environmental and water development objectives, the accommodation effort ultimately failed to develop the Prairie Bend II project. This struggle perhaps reflects the inherent difficulty of reconciling conflicting preservation and resource development objectives.

Groundwater Quality Protection

Fertilizer and pesticides applied to crops may leach into groundwater supplies, causing contamination (Bouwer 1990; Nielsen and Lee, 1987, pp. 14-17). Groundwater contamination from agricultural chemical use may be controlled through implementing agricultural "Best Management Practices" (BMPs) to minimize chemical leaching into groundwater supplies (Logan, 1990; Bouwer, 1990, pp. 187-88). Fertilizer BMPs include reducing application rates to the quantity needed to accomplish the producer's yield goal and counting fertilizer already present in the soil and fertilizer applied with nitrate-contaminated irrigation water (Logan, 1990, p. 203). Pesticide BMPs include reduced application rates; applying pesticides only when pests emerge, rather than in anticipation of emergence; banding rather than broadcast application; pest-resistant crop varieties; and crop rotation (Logan, 1990, p. 203; Bouwer, 1990, pp. 187-88). The policy challenge includes how to accomplish more widespread BMP implementation to reduce groundwater contamination, and when more severe control methods, such as prohibiting or limiting the use of specific agricultural chemicals contaminating

groundwater, should be implemented (Libby, 1990; Nielsen and Lee, 1987; Batie and Diebel, 1990; and Schneider, 1990).

Nitrate contamination of groundwater supplies has been a concern in the Central Platte River Valley at least since the 1970s (Exner and Spalding, 1987, pp. 206-07). Under the federal Safe Drinking Water Act, communities must monitor drinking water quality and report violation of the EPA drinking water standards to customers and to state officials (Aiken, 1993, pp. 644-54). Widespread nitrate contamination of rural community water supplies in Nebraska has resulted in heightened awareness of non-point pollution of groundwater from agricultural chemical use (Aiken, 1993, pp. 639-43, 671-72). Legislation adopted in 1982 authorized the NRDs to prepare groundwater management plans to deal with groundwater depletion and non-point source pollution (Aiken, 1993, pp. 676-79). The CPNRD fertilizer regulations, discussed previously, were the first developed in Nebraska and possibly in the nation (Schneider, 1990). While many states authorized pesticide regulations to protect groundwater quality, few authorized fertilizer regulations for the same purpose in the early 1980s (Aiken, 1993, pp. 659-67). Thus the CPNRD fertilizer regulations were innovative, serving as a model for other NRDs within Nebraska as well as for local conservation districts nationwide.

The CPNRD fertilizer regulations have met with some resistance. Under CPNRD Phase II regulations, farmers must annually report soil and water sampling results for nitrate content to the NRD. A CPNRD farmer refused to do so in 1990 and was taken to court. A 1991 amendment to groundwater management area statutes authorized the NRDs to require farmers to submit soil and water test results for chemical content. The court ruled that this 1991 amendment legally precluded soil and water sampling from being a BMP under the NRS §46-673.01 (now §46-656.25) prior to the 1991 amendment. Consequently, the CPNRD soil and water sampling and reporting requirements were not legally enforceable until the CPNRD readopted them pursuant to the 1991 amendment (*Wagoner v. Central Platte NRD*, 526 NW2d 422 (Neb 1995)). Despite this setback, overall farmer compliance with CPNRD fertilizer regulations has been very high (Ferguson and Moravek, 1990, p. 266).

Section III

Analysis of Effectiveness of Federal, State and Local Efforts to Resolve Problems

Overview

This section presents an analysis of the effectiveness of federal, state and local efforts to resolve the water resources development in management problems described in Section II. Most of this analysis is focused on the activities and procedures employed to resolve the problems detailed in Section II. The goal of this section is to prepare the basis for recommendations detailed in Section IV.

Analysis of Policies and Programs for Endangered Species Flows in Central Platte

Providing necessary flows for recovery of the endangered species is an underlying problem in most of the current water resource management and development conflicts in the Platte River basin including:

- C relicensing of Kingsley Dam
- Municipal water supply in the front range area of Colorado
- Avoidance of jeopardy opinions for new water development projects throughout the basin

Past efforts have not been successful in resolving this problem of water for recovery of the endangered species. Settlement of the Grayrocks Dam and Reservoir controversy in 1978 resulted in creation of the Platte River Whooping Crane Habitat Trust, but did not provide reliable flows to the critical reach for recovery purposes. Following issuance of a jeopardy opinion on the Narrows Project in 1983, the Platte River Management Joint Study was initiated to resolve outstanding issues regarding construction of the Narrows Project and endangered species protection on the Platte River in central Nebraska. At the request of water users in Colorado, Wyoming and Nebraska, this effort was expanded in 1984 to address all potential conflicts between water development and management in the Platte River basin and endangered species protection in the Big Bend area of the Platte River. The Platte River Coordinating Committee, consisting of the U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, and the states of Colorado, Wyoming and Nebraska, was established in March 1985. The Coordinating Committee established technical committees to address a broad number of

hydrologic and biological issues associated with water management and endangered species protection. These efforts, however, were not successful in creating a recovery program for the Platte River endangered species.

The ongoing litigation in *Nebraska v. Wyoming* has provided no resolution of endangered species recovery in the central Platte River. The FERC relicensing process has cost millions of dollars and taken more than 10 years and has provided no acceptable resolution. The federal agencies (FERC, U.S. Fish and Wildlife Service, Army Corps of Engineers, Natural Resources Conservation Service, and the Bureau of Reclamation) have provided limited leadership in resolving this matter. Until initiating the Memorandum of Agreement process, the three states provided little leadership for resolving this problem of water for recovery of the endangered species, although the state of Nebraska did provide leadership in developing the Nebraska Alternative (with the environmental account) for the FERC relicensing.

One possibility for resolving the conflict of providing water for the endangered species would be to repeal the Endangered Species Act or significantly amend the act (Pitts, 1995). This recommendation is beyond the scope of this investigation; however, it presently appears unlikely that the Endangered Species Act will be eliminated or be so substantially modified that requirements for providing flows to the critical habitat reach in the Big Bend area would be eliminated. Therefore, the remainder of this section focuses on ways that federal agencies and the states can facilitate development and implementation of a recovery program.

Providing additional water for recovery of the endangered species requires interstate, inter-agency and inter-jurisdictional cooperation, which in turn requires relinquishing some authority and responsibility to a common entity. (See Bleed, A., et al, 1990 for an analysis of the institutional arrangements and decision processes in the Platte Basin.) The states, federal agencies, and local units of government have generally resisted relinquishing authority involving water allocation, water development, and water management. (See for example U.S. Bureau of Reclamation, 1982; Woodward - Clyde Consultants, 1981; MacDonnell, Lawrence, J, 1985; and Caulfield, Henry P., 1987.)

The federal agencies have long resisted close cooperation since the days of the Pick-Sloan Plan. Examples exist of individual agencies attempting to promote basin plans involving only their individual programs and projects (Environmental Protection Agency, 1972). The states have always been hesitant to cooperate with other states with which they have been, and are currently, involved in litigation over allocation of common rivers and with which they are in competition for federal water project funds. In the late

1970s, the Missouri River Basin Commission completed the Platte River Basin Level B Study (Missouri River Basin Commission, 1976). This Level B planning study for the Platte River basin only covered the portion of the basin within the state of Nebraska, thereby demonstrating the lack of interest by the other states in cooperating with one another and the federal agencies to develop a comprehensive study for the entire basin.

Despite various attempts to develop a mutually acceptable management plan for the Platte River basin, conflict and litigation have dominated the decision process in the past (Bleed, 1989; Klein and Williams, 1993).

A systems solution for the entire Platte River basin is required to help ensure delivery of water to the endangered species wildlife habitat in the Big Bend area (Fontane, 1993). Models have been developed for portions of the Platte River basin, but none has been developed for the entire basin that is acceptable to all three states and the federal agencies (Gilliland, et al, 1985 and Grigg, et al, 1984). Consequently, three states, at least six federal agencies, and numerous local agencies (municipalities, irrigation districts, water and sanitation districts, and natural resources districts) must reach some kind of mutually acceptable systems solution. The Master Water Control Manual for the Missouri River (U.S. Army Corps of Engineers, Missouri River Division, 1994) offers an example of federal leadership in the development, management and operation of an interstate water resources system, in this case primarily for navigation and power production purposes. This system consists mainly of Corps projects over which the Corps has direct control; nevertheless, the main stem Missouri is a complex interstate system. Whether it would be desirable, or possible, for the federal agencies to involve themselves to a comparable degree in the Platte River for purposes of providing water to the endangered species is open to question.

There is considerable technical and scientific uncertainty involved in providing necessary flows for recovery of the endangered species in the Big Bend area (Bleed, 1987). This technical and scientific uncertainty makes it difficult to determine how much water, of what quality, at what times, with what frequency and with what duration is required to recover the endangered species. Development of a successful recovery program could be made much more efficient by developing quantitative relationships between: (1) the quantities, quality, frequencies of flow and durations of flow and (2) the effect on endangered species and the endangered species habitat. Without some quantitative relationships that the various stakeholders can reasonably agree upon, development of a recovery program will continue to be retarded by conflicts over the technical and scientific uncertainty associated with the quantity and timing of flows required for flows to recover the endangered species. This is perhaps a major area in which the U.S. Fish

and Wildlife Service in cooperation with its counterpart state agencies could greatly assist establishment of a recovery process. It may be, however, impossible to develop extremely accurate quantitative relationships for linking flow amounts, frequency and duration with effects on endangered species and its habitat. In this case, it will be necessary to develop quantitative relationships that are at least acceptable enough to the various stakeholders for planning and design purposes.

The same situation is true with respect to the importance of sediment in maintaining desired habitat conditions for restoration of the endangered species in the Big Bend area (Hadley, R. F., et al, 1987). The importance of sediment to morphologic changes in the Platte River is discussed further in Eschner, et al (1981). Development of better quantitative relationships for determining the importance of sediment in preserving wildlife habitat for endangered species would facilitate development of a restoration program. Again, this is an area of research that could benefit from cooperative support by the U.S. Fish and Wildlife Service, the U.S. Geological Survey and perhaps other federal water agencies.

Nebraska and Wyoming are involved in litigation over the North Platte River. Litigation does not generally provide a good vehicle for resolving questions involving technical and engineering uncertainties or for providing innovative solutions to water allocation problems. Furthermore, litigation in one area, such as the North Platte River, hinders cooperation among the states on other water resources development management questions elsewhere in the basin. In general, litigation inhibits the kind of cooperation on system solutions required for development of a successful recovery program.

Until initiation of the MOA/Cooperative Agreement process by the Department of the Interior, the federal agencies had not been very effective leaders in resolving the problem of water for the endangered species. This hesitancy for the federal agencies to assume a leadership role may have resulted, in part, from an absence of authorized projects or authorized programs in the basin that would have provided a vehicle for federal agency involvement in providing water for recovery of the endangered species (e.g., the Army Corps of Engineers).

Authority does exist for some agencies, such as the Corps of Engineers, for involvement in environmental restoration projects through Section 1135 of the 1986 Water Resources Development Act. Continuing authorities such as Section 1135, however, will only allow the Corps to become involved in projects where construction would be less than \$5 million. Specific congressional authorization would be necessary for larger projects.

The federal water agencies (Bureau of Reclamation and the Corps of Engineers) are playing major roles in recovery programs and environmental restoration programs elsewhere in the United States. It is interesting to compare the proposed recovery program emerging from the Platte River Basin Memorandum of Agreement/Cooperative Agreement process with the recovery program for fish on the Columbia River where the federal agencies are playing a much greater role. In the Columbia River recovery program, the Army Corps of Engineers is presently allocating funds at approximately \$120 million a year for the next five years toward the restoration of the salmon fisheries. In addition, the Corps is providing for releases of water from hydropower storage in its reservoirs on the Columbia for maintenance of wildlife habitat. The Western Area Power Administration (WAPA) is also allocating funds at a rate of approximately \$100 million per year for the fisheries restoration, while the Bureau of Reclamation is spending approximately \$30 to \$40 million a year for the same purpose. The Central Valley Improvement Project in California, the Upper Mississippi River Environmental Restoration Project, the Everglades Environmental Restoration Project, and the Columbia River Basin Salmon Restoration Program provide examples of environmental restoration projects and recovery programs that have been, or are being, planned and implemented according to congressional authorization of various specificities. All of these projects associated with the recovery program on the Columbia River demonstrate that there can be significant technical and financial involvement by federal agencies in recovery programs.

A recovery program on the Platte has been, and will continue to be, hampered by the lack of a decision support system for the entire Platte River basin covering all three states. A fundamental component of such a decision support system would be a flow model of the Platte River main stem and the North and South Platte Rivers including the linkage between streamflow and the alluvial groundwater (see Hurr, 1983; Burns, Alan W., 1983; for initial work on the groundwater/surface water linkage). Furthermore, the absence of applicable operational sediment transport models also will likely continue to hinder resolution of the problem. This lack of a decision support system for the recovery program in the Platte River basin indicates the absence of a primary tool required to plan for and provide necessary flows to the Big Bend area.

The Draft Cooperative Agreement recently agreed to in principle provides for progress in developing a decision support system for the Platte River basin and the development of some quantitative relationships on which to base flow requirements for the critical habitat area (States of Colorado, Nebraska, Wyoming and the Department of the Interior, May 1997). The Governance Committee or the Water Management Committee will develop a

tracking/accounting procedure for determining depletion/accretion impacts for the Program Water Projects and New Water Related Activities including Water Conservation Supply Projects. The Cooperative Agreement also provides for a technical committee appointed by the Governance Committee to develop protocols for the initiation of the habitat and species monitoring and research (see Attachment I to the May 1997 Draft Cooperative Agreement). These tasks in the Draft Cooperative Agreement should provide for some progress in reducing the uncertainty between flow requirements in the critical habitat reach.

Reallocating water in the Platte River for recovery of the endangered species involves the state administered prior appropriation system of water rights. The states have resisted giving up any authority concerning allocation of water rights through the prior appropriation system.

The most potentially successful effort to date in the Platte basin for resolving the endangered species water supply problems is the ongoing Memorandum of Agreement/Cooperative Agreement effort. Several reasons exist for the apparent success of this effort to date including:

- The MOA/Cooperative Agreement effort is not litigation driven, thereby avoiding some of the expense and delays inherent in attempting to use litigation to resolve technically complex problems.
- The MOA/Cooperative Agreement involves all three states and the most involved federal agencies. Furthermore, the states are represented by officials high enough to commit their states (State Engineers, Directors of Departments of Natural Resources, etc.).
- The powerful incentive of likely future jeopardy opinions on water development projects has prompted the three states to demonstrate leadership and become involved in an effort to avoid jeopardy opinions on future water projects and the resulting competition for mitigation water among entities supporting these future projects.

The eventual success of the on-going MOA/Cooperative Agreement process is not yet known. The present status of this process is discussed in Section II herein. The MOA/Cooperative Agreement process can still disintegrate into each state, or each project proponent, having to develop its own mitigation efforts in order to avoid a jeopardy opinion. If the MOA/Cooperative Agreement process is not successful, it will be highly desirable for at least the states to pick-up the pieces and develop a state based recovery program. If states do not develop a successful state based recovery program, sponsors of proposed water development projects and permit applicants will have to

develop individual mitigation activities for each project and each permit application. This will substantially increase the regulatory burden on these sponsors and applicants.

In contrast to the apparent success of the MOA/Cooperative Agreement process, the FERC relicensing for Kingsley Dam has contributed little to resolving the water concerns for the endangered species recovery problem, beyond the Nebraska environmental account proposal. In fact, FERC relicensing for Kingsley Dam demonstrates the general inefficiency and ineffectiveness of developing individual mitigation requirements for individual projects, regulatory activities or programs. A recovery program that can handle large projects such as relicensing a 1.7 million acre-foot reservoir as well as the issuance of a 404 permit for a new diversion structure is required, if the recovery of the species is to be attained without injury to existing water users.

Probably, the major limitation in the FERC relicensing process is the process itself, which is basically adversary in nature and has limited tools to effect the kind of system-wide solution that is required. The FERC relicensing process is inherently ineffective in bringing together the various stakeholders to develop mutually acceptable solutions. That the state of Nebraska has persevered in this process, at least regarding the resolution of conflicting instate water interests concerning the environmental account proposal, is a testament to the leadership the state of Nebraska has provided. The FERC relicensing process was never intended, however, to resolve large complex, interstate water resource allocation problems and environmental conflicts; rather, it was intended to resolve hydroelectric siting questions. Consequently, it is unlikely that the relicensing process could be sufficiently altered or changed in order to allow it to effectively resolve such complex, interstate water resource allocation and environmental conflicts. It will probably prove to be more efficient to develop an alternative vehicle, such as the MOA/Cooperative Agreement process for conflict resolution involving development of a recovery program for the endangered species. In a basin-wide recovery program, relicensing of Kingsley Dam will then become another project, albeit a major one, in the recovery program.

Analysis of Policies and Programs for Non-Point Pollution of Central and Lower Platte

Non-point pollution control has posed a real policy dilemma to Congress. While point sources are regulated under the Clean Water Act national pollution discharge elimination system (NPDES) system, non-point sources are not directly regulated. Instead, under the §319 program, states identify

areas where non-point source contamination violates surface or ground water standards, and the EPA provides cost-sharing assistance to states to deal with priority non-point pollution problems. For agricultural non-point source problems, states use §319 funding to provide cost-sharing assistance to agricultural producers to implement a variety of Best Management Practices (BMPs) to control non-point source pollution. This system seems to be working well, and probably is more efficient than attempting to regulate non-point sources through the NPDES program.

The §319 cost-sharing program complements state non-point pollution control efforts. The water testing requirements of the federal Safe Drinking Water Act have identified communities whose water supplies are being contaminated by non-point sources. Until recently no SDWA funding was available to deal with non-point source contamination of public drinking water supplies. Thus, states were responsible for developing non-point source controls to deal with non-point contamination of public drinking water supplies. The availability of §319 cost share funds facilitates voluntary efforts to prevent non-point sources from contaminating public drinking water supplies.

The SDWA program does not regulate the sources of contaminants polluting a public drinking water supply, although the SDWA wellhead protection program encourages states and/or to do so. The wellhead protection program provides federal funding for state programs protecting underground sources of drinking water. State wellhead protection programs assist communities in identifying community well recharge areas, potential contaminant sources, and encourage communities to use local land use and other authorities to protect the well recharge areas from contamination. The EPA might consider integrating the SDWA wellhead protection area program with the §319 program to protect community water quality in a more focused, cost-effective manner.

Congress in 1996 amended the SDWA to provide small communities more flexibility in meeting the EPA drinking water standards. These amendments should allow communities to supply drinking water meeting the EPA standards to their residents in a more cost-effective manner. Hopefully these changes will not reduce state incentives to protect drinking water quality through non-point source controls.

Analysis of Nebraska V. Wyoming

Nebraska v. Wyoming is concerned with interpretation of the 1945 Decree as amended in 1953. Areas of requested interpretation include the following:

- Should Wyoming be allowed to build additional storage on the tributaries to the North Platte River?
- Is the limitation on irrigated acreage on the mainstem and tributaries above Pathfinder and from the mainstem between Whalen Diversion Dam and Pathfinder Reservoir being exceeded?
- Is operation of components of the project such as the Inland Lakes in conformity with the Decree?

Litigation is probably the only way that such conflicts over interpretation of the North Platte River Decree can be resolved. Litigation, however, is not generally an efficient process for bringing resolution to complex technical conflicts. Furthermore, this litigation cannot be very effective in resolving conflicts over matters that are at best peripheral to the 1945 Decree, for example water for the endangered species habitat in the Big Bend area.

Litigation is generally negative and offers few opportunities for the federal agencies to promote positive, innovative solutions to water conflicts in the Platte River basin. Contributions by the Bureau of Reclamation to resolving the conflicts underlying *Nebraska v. Wyoming* has been constrained because of the adversary nature of the process. Nevertheless, the Bureau's North Platte Projects office has been active in seeking innovative management measures that could assist in resolving some of the conflicts on which *Nebraska v. Wyoming* is based; this is probably the best that can be hoped for in interstate water litigation.

Analysis of Front Range Water Supply

Current front range municipal water supply conflicts have resulted from a number of historical factors including :

- The demise in the early 1990s of the one million acre-foot Two-Forks Reservoir project on the South Platte River, upstream from Denver.
- Traditional western reluctance toward regional planning or cooperation and the resulting Balkinization of municipal water supply in the front range area.
- Competition among municipalities and water districts for tax base, customers, and water rights.
- Rapid growth in the front range area during the 1990s.

Front range area water supply conflicts and conflicts in the South Platte basin are discussed more fully by Grigg, et al (1987).

In the last two to three years, the Colorado Department of Natural Resources and the Denver Board of Water Commissioners have assumed leadership roles in seeking cooperative and coordinated solutions for future water supply in the front range area of Colorado. Governor Roy Romer; former Director of the Colorado DNR, Ken Salazar; present DNR Director, James Lockhead; the five member Board of Denver Water Commissioners; Denver Water Department manager, Chips Barry; and the planning staff of the Denver Water Department have all shown leadership in initiating processes to resolve the existing and future water supply problems and conflicts in the front range area.

The federal agencies including the Army Corps of Engineers, Bureau of Reclamation, U.S. Geological Survey, and the Environmental Protection Agency have not been actively involved in these recent efforts to promote a comprehensive, coordinated solution to municipal water supply problems in the front range area.

The Army Corps of Engineers has few existing, or on-going, projects and programs in the front range area that could be of assistance in resolving these municipal water supply conflicts. Perhaps the sole example is the current study by the Army Corps of Engineers concerning reallocation of Chatfield Reservoir storage for water supply purposes.

The Bureau of Reclamation also has few existing projects or programs directly affecting the water supply situation in the Denver metropolitan area. The Bureau can, however, greatly assist effective implementation of projects and management measures to resolve water supply conflicts for municipal water supply in the Denver metropolitan area by active and innovative participation in the Memorandum of Agreement process for developing a recovery program for the endangered species of the South Platte River. Successful implementation of the MOA process in development of a recovery program will definitely positively affect implementation of projects and measures to resolve water supply conflicts in the Denver metropolitan area.

The Fish and Wildlife Service can make a significant contribution to resolving the front range municipal water supply problems by assisting in development of a practical and efficient cooperative recovery program that will permit efficient implementation of projects and programs that would avoid jeopardy opinions.

The USGS could likewise potentially contribute to resolution of front range water supply problems with its experience and expertise with regard to the Denver basin and assistance with the development of a recovery program for the Platte River endangered species. However, the slowness of the USGS analysis, the endless review process in Reston, Virginia and the general reluctance of the USGS to involve itself in politically complex water problems will probably preclude any invitation by the stakeholders for involvement in resolution of the front range water supply conflicts. Sooner or later, the USGS must decide if it is willing to become involved in the solution of real-world water problems.

In general, there appears to be limited opportunities for involvement by the federal agencies to resolve the front range water supply problems; these problems must be resolved by local water suppliers and the state of Colorado.

Further resolution of the by-pass flow issue involving the U. S. Forest Service might offer an opportunity for a federal agency to participate in the resolution of federal-state-local conflicts involving municipal water supply in the front range area. The initial conflict, involving the Forest Service attaching requirements for maintenance of instream flows to renewal of special use permits for existing municipal water diversion and storage facilities in northern Colorado, has been resolved with the development of Joint Operating Plans for the facilities that will provide instream flows to reaches below the diversion and storage facilities. Development of the Joint Operating Plans was done without litigation, but was still an expensive and time consuming process for the cities and municipalities involved.

Creation of a task force by P.L. 104-127 to analyze some of the major policy issues involved offers an opportunity for a federal agency, the U.S. Forest Service, to become positively involved in resolving an important water resources conflict involving municipal water supply in the Colorado front range area. The task force scope of work should potentially allow analysis of major, contentious policy issues in a forum more amenable to thoughtful consideration than litigation. The scope of work for the task force includes analysis of possible measures that would be useful in avoiding or resolving conflicts between the Forest Service responsibilities for resource and environmental protection and the rights of municipalities holding special use permits for existing diversion and storage facilities on Forest Service land.

Analysis of Local Watershed Case Study

Non-Point Water Pollution Control

As noted in Section II, the Central Platte Natural Resource District (CPNRD) fertilizer regulations have been a state and regional model for non-point pollution control of agricultural chemical use. However, several NRDs have adopted fertilizer controls that, when implemented, should provide greater groundwater quality protection than current CPNRD regulations. When NRDs were required to revise and implement their groundwater management plans to protect groundwater quality by 1997, the Nebraska Department of Water Resources determined that the plans should be prevention oriented, and that control measures should be implemented before contaminant levels exceeded the EPA drinking water standard. Because the DWR was required to review all NRD groundwater management plans, NRDs accordingly adopted nitrate levels below the 10 ppm MCL to trigger fertilizer controls. This administrative decision by the DWR significantly advanced the level of protection that NRD fertilizer controls will provide.

The EPA §319 program compliments NRD non-point pollution control programs. The EPA could encourage prevention-oriented approaches such as the new Nebraska NRD fertilizer controls by conditioning §319 funding on adopting and implementing enforceable controls to prevent (as well as control) non-point water pollution. Such financial incentives could encourage states to take a more prevention oriented approach to non-point pollution control.

Groundwater Depletion

Groundwater depletion in most areas of the west will be dealt with in the future by better management of remaining groundwater supplies or by inaction, but not by government provision of a rescue project.

Groundwater management, especially depletion control, is primarily a state responsibility. The progress that has been made in Nebraska through NRD fertilizer controls has not been matched with NRD control of groundwater depletion. The state of Nebraska could require NRDs where groundwater depletion is occurring, or likely, to update groundwater management plans to deal with groundwater depletion. If the state indicated that a prevention approach is needed, this could result in progressive groundwater management plans dealing with depletion similar to the new NRD fertilizer controls.

Federal policy could encourage states to undertake more aggressive groundwater management programs by expanding the current Conservation Reserve Program under the 1996 Farm Bill to include cost-sharing for

groundwater management. The §319 program has been successful in persuading farmers to adopt BMPs to protect water quality; a similarly structured CRP could do the same to protect groundwater supplies. Irrigation scheduling and similar irrigation BMPs could reduce groundwater use and in many cases significantly extend aquifer life. This expanded CRP could also encourage states to adopt and implement regional groundwater management plans to control or slow groundwater depletion.

Section IV

Findings and Recommendations

Federal and State Roles in Water Resources Management and Development Have Changed Significantly in Recent Years

The roles of federal and state government in water resources management and development have changed significantly in recent years. The states have demonstrated leadership in water resources management and development that did not exist earlier. In addition, the states have developed sources of technical expertise within state agencies and through the use of outside consultants. This level and range of technical expertise with respect to water resources management and development did not exist until relatively recently. Furthermore, the states have developed sources of funding for water resources management and development where previously they depended partially or almost entirely on the federal government for necessary planning, design, construction and management funds.

Therefore, the role of the federal government in water resources management and development is now more narrowly defined. For example, in the case of municipal water supply for the front range metropolitan area in Colorado, the federal role is probably limited to providing assistance for resolving the endangered species problems in the central Platte and determining if flood control storage in Chatfield Reservoir can be reallocated. The federal role is limited because the state of Colorado and the local municipalities and water districts possess the necessary leadership, technical expertise, and funding sources to resolve the conflicts and demands for municipal water supply, if these competing entities can cooperatively work together.

The federal agencies must recognize the increased leadership, technical expertise, and funding sources existing in the states and local governments for resolving water resources management and development conflicts. Likewise, the states must increase their recognition of the federal needs for water on federal lands.

The federal government, however, still plays a vital role in the recovery of the species. The three states whose development interests are affected by Platte River wildlife recovery efforts are not appropriate entities by themselves to make decisions regarding future management of habitat vital to the conservation of migratory bird populations that migrate south to north across the entire nation. Colorado and Wyoming in particular confront only the potential costs of the recovery effort and will receive no direct benefit. Under

these somewhat unique circumstances, the federal government must be involved in these decisions.

Modify Federal Water Agency Policies and Programs to Make Them More Applicable to Today's Water Problems

The federal water agencies' planning processes may no longer be very applicable for resolving the water resources problems and conflicts that exist in the Platte River basin in the 1990's. Colorado, Nebraska, and Wyoming cannot wait several decades for resolution of the water for endangered species habitat problem. Similarly, the front range Colorado municipalities presently competing for municipal water supply have the technical expertise and funding to resolve the problem by themselves, if they are willing to work together in a cooperative manner. Farmers and Nebraska Natural Resource Districts have not wanted to wait for the federal government to address non-point source agricultural pollution problems, if appropriate progress in resolving this problem could be made now at a local level. If the federal water agencies (Army Corps of Engineers, Bureau of Reclamation, Natural Resources Conservation Service, U.S. Geological Survey, and the Environmental Protection Agency) want to be participants in resolving these current water conflicts in the Platte River basin, these agencies must review the procedures under which they do business and determine if the investigation, planning and design procedures employed by the individual agencies can be modified to be more responsive to present demands and needs.

A limiting factor on efficient and effective assistance by federal water agencies is the amount of time required for the agency to obtain authorization for solving the problem. The Corps of Engineers can quickly become involved in several types of water resources projects under continuing resolutions, including environmental restoration, if project cost is less than \$5 million (U.S. Army Corps of Engineers, 1990). The Corps should seek to extend this continuing authority process to larger projects, including nonstructural projects. Likewise the Bureau of Reclamation should seek to extend its continuing authorities to larger projects, including environmental restoration.

The Bureau of Reclamation should consider modifying its existing regulations pertaining to planning of environmental restoration projects or, if necessary, developing new regulations comparable to those already developed by the Corps of Engineers for environmental restoration projects (U.S. Army Corps of Engineers, 1995a, 1995b, 1995c, and 1996). Such

planning regulations and procedures could increase the effectiveness of assistance by the Bureau in developing environmental restoration projects and recovery programs in the Platte River basin. Such regulations, for both the Bureau of Reclamation and Corps of Engineers, should allow for planning and design of projects appropriate for the water resources systems. As evidenced by the Platte River, the problem of water for the endangered species cannot be solved by a single project (e.g., modifying operations of Kingsley Dam), but must be solved by consideration of the total system. Therefore, systems planning, design, and authorization is required. Systems authorization is not required in all cases but the opportunity should exist for systems such as the Platte River. In the past, Congress has generally been hesitant about providing system authorization and has generally been determined to retain single project authorization. Congress, however, must realize the importance of system authorization for environmental restoration programs such as the Platte River recovery program. The Bureau of Reclamation and Army Corps of Engineers should seek continuing authority for the planning and design of systems solutions to environmental restoration problems.

The U.S. Geological Survey has significant technical expertise and experience to contribute to resolving existing Platte River basin water conflicts and problems. This contribution has been limited in the past, however, by the reluctance of the USGS to become involved in problems that are politically controversial, which includes many water conflicts and problems. Furthermore, the length of the USGS review process in the past has tended to diminish the usefulness of their products in resolving real world conflicts and problems because problem resolution could not wait for the USGS review process to be completed. If the USGS wants to apply its well regarded technical expertise to current and future water problems, it must determine how to: (1) involve itself in projects or controversies that have a political dimension and (2) speed up its review process so that the report is published and disseminated while it is still timely and can contribute to the solution of the problem or resolution of the conflict. Perhaps the USGS should consider developing a new publication series that would be more action oriented, and defer any separate, more traditional publication arising out of the particular water resources project or controversy to accommodate the USGS's traditional review process. Thus the preliminary information could be presented to decision makers in a more timely fashion, but the final technical report (if one were to be prepared) could be published after the USGS's traditionally thorough technical review.

Federal agency cost sharing policies for federal involvement in environmental restoration projects need to be revised and/or developed. The recovery program for the Platte River endangered species program is an

environmental restoration program for the recovery of migratory birds that requires involvement of a number of federal agencies, including the Bureau of Reclamation, U.S. Army Corps of Engineers, and the U.S. Fish and Wildlife Service, to restore the habitat of the central Platte River to the level required for recovery of the endangered species. The focus of this recovery program on endangered species of migratory birds provides the basis for significant federal involvement because the benefits of this program extend far beyond the reach of the central Platte in Nebraska. There appears to be a significant difference in the cost sharing arrangements and the levels of cost sharing proposed by the federal agencies for the Platte River recovery project as compared with other environmental restoration projects such as the Columbia River Salmon Restoration Program, the Upper Mississippi Environmental Management Program, the Everglades Restoration Project, and the Central Valley Improvement Project. Increased levels of federal funding for the Platte River recovery program equivalent to funding levels for these other environmental restoration projects and programs would facilitate implementation of the Platte River recovery program. Development of federal agency cost sharing guidelines or regulations would facilitate equity in cost sharing for environmental restoration projects and programs. These cost sharing guidelines or regulations should be based on determination of the federal interest in a specific project and would provide funding equivalent to that level of interest. Congress should consider specific funding for the Platte River recovery project, similar to the Columbia River Restoration Program, the Central Valley Improvement Project and similar environmental restoration projects.

Modify the Principles and Guidelines

Federal water agencies should consider changing their planning and project evaluation procedures in order to recognize the changes that have occurred and are occurring in water resources management and development.

The Principles and Guidelines (United States Water Resources Council, 1983(a) and (b)) were developed for evaluating and justifying individual water resources projects. Justifying individual projects may no longer be the relevant criterion for environmental restoration projects. Applying a standard of cost effectiveness may be more relevant to environmental restoration projects than providing economic justification. Furthermore, the four account system of the Principles and Guidelines (National Economic Development, Environmental Quality, Regional Economic Development and Social Well-Being) with its emphasis on economic efficiency and environmental acceptability may likewise be outmoded for the water resources management and development projects of today. Planning and

designing a project based on maximizing national economic development subject to producing an environmentally acceptable project may have little relevance to an environmental restoration project. Somehow, economic evaluation should be carried out. Therefore, serious consideration should be given by those major federal water agencies, which still adhere to the Principles and Guidelines, to a revision of the guidelines in order to better meet the requirements of today's water resources management and development planning processes.

Establish Necessary Governance Structure to Administer the Platte River Basin Recovery Program

The states together with the federal agencies must establish a governance structure for the MOA/Cooperative Agreement generated Platte River Basin Recovery Program that will ensure: (1) appropriate state government and stakeholder involvement in completion of the NEPA compliance tasks, and (2) implementation of research and other projects beneficial to the target species and their associated habitats. In addition, the states and federal agencies must ensure that sufficient authority is transferred to this governance structure to allow for successful implementation of the Platte River Basin Recovery Program. This governance structure should not be a river basin commission, but rather should have necessary authority and responsibility required to ensure successful development and implementation of the Platte River endangered species recovery program. The Cooperative Agreement establishes a 10-member Governance Committee composed of representatives of the states, Department of the Interior, water users and environmental organizations. The Governance Committee will oversee activities under the Cooperative Agreement and will serve as a forum for dispute resolution. The Governance Committee will have an executive director and will establish land and water management committees to carry out activities under the Program. This organization should provide a successful basis for carrying out the Platte River Basin Recovery Program. It is focused on the Platte River Basin Recovery Program and avoids the overly broad authorities of the old Title II River Basin Commissions.

Development of a river basin commission type of governance structure is not presently desirable, nor should it be necessary for implementation of the recovery program. Past experience with the Title II River Basin Commissions (e.g., the Missouri River Basin Commission) demonstrated that the states and federal agencies in the Platte River basin did not actively support the River Basin Commission. Based on review of the water conflicts in Section II, political and institutional conditions in the Platte River basin

have not changed sufficiently since the demise of the Missouri River Basin Commission to warrant consideration of creating an entity similar to the Missouri River Basin Commission.

Federal Agencies Should Provide Necessary Assistance to States to Resolve Interstate Conflicts But Do Not Revive the U.S. Water Resources Council

One of the principal reasons for the demise of the U.S. Water Resources Council and the associated Title II River Basin Commissions was the reluctance by the states and federal agencies to provide a single entity, such as the Water Resources Council, with sufficient authority and responsibility to meet its objectives. After reviewing the current water resources planning, management, and development situation in the Platte River basin, there is little indication that the situation has changed and that the states and federal agencies would be willing to give necessary continuing authority to a common entity, such as the Water Resources Council, required for this entity to be effective in resolving conflicts among these states and federal agencies. Therefore, it is recommended that the U.S. Water Resources Council, or an entity similar to the Water Resources Council for purposes of promoting coordination of water resources planning and development among the states and federal agencies, not be revived at this time.

The States Need to Develop Legal and Institutional Mechanisms to Resolve Water Conflicts

Colorado, Nebraska and Wyoming need to develop and implement the legal and institutional mechanisms required to implement the Platte River recovery program. Specifically, the state of Nebraska needs to develop necessary legal and institutional mechanisms to protect flow conditions in the Big Bend reach and to ensure that flows targeted for meeting habitat flow requirements in the Big Bend area actually reach the Big Bend area. This may involve developing a successor to Nebraska Statute §§46-256 and 46-665.05(5) in order to protect surface flows from diversion by alluvial wells. Development by the state of Nebraska of necessary legal and institutional mechanisms to ensure delivery of flows to the Big Bend reach is critical if a successful recovery program is to be developed and implemented. Under terms of the Cooperative Agreement, Nebraska will develop means for protecting program water deliveries, above the existing flow conditions, to and through the critical habitat and will, in cooperation with the other parties, select pilot projects for potential protection under Nebraska Statute

§46-252 (see Milestone W3-1 in Attachment I to the Draft May 1997 Cooperative Agreement).

It would be desirable for Nebraska to implement a water marketing system that would provide for transfers of water rights to new points of diversion and for new uses. A water marketing system would allow for more efficient utilization of existing water resources. The water transfer and water marketing systems and procedures in both Wyoming and Colorado, while not necessarily perfect, allow for more flexibility in transfers and changes of use. The availability of the water marketing option could ameliorate the problem of protecting surface flows from diversion by alluvial wells by providing an alternative to state-line releases for habitat flows. If water marketing were available in Nebraska, then Colorado, Wyoming and Nebraska would have the option to purchase water rights in the habitat region to satisfy their water delivery requirements. If Colorado, Wyoming and Nebraska met their water delivery requirements primarily or exclusively through acquisition of water rights, the difficulty of protecting surface flows from diversion by alluvial wells would be correspondingly reduced. However, the Cooperative Agreement requires water depletions to be replaced in the state in which the depletion occurs. Unless this provision is modified, water marketing in Nebraska would provide new options for Nebraska to meet its streamflow obligations, but would not broaden the management options available to Colorado or Wyoming. Nebraska law currently allows water marketing for the same use within the same river basin (NRS §46-290 to 294). The experience with intrabasin water marketing could provide a foundation for developing a more comprehensive water marketing system similar to what exists in most western states.

Federal Agencies Develop Better Tools for Technical Support to the States in Resolving Water Conflicts

The federal agencies should take the initiative in developing better decision support systems for resolving problems inherent in providing water to the Platte River critical habitat. Distrust among the federal agencies and the states has long retarded development of decision support tools for the entire Platte River basin. It would appear, however, that the initiative could be taken by the federal agencies (e.g., USGS, Bureau of Reclamation, Corps of Engineers, Fish and Wildlife Service, and EPA) to develop the necessary flow models, sediment transport models and quantitative linkages between flow levels and habitat conditions to more efficiently resolve the problems associated with providing water for the endangered species habitat. An example of a decision support system developed to assist implementation of a recovery program is the Colorado River Decision Support System developed

by the state of Colorado for assisting in the recovery program for the Colorado River endangered species. Developing a successful decision support system covering the Platte River, North Platte River and the South Platte River will require cooperation among the three states and the federal agencies. In the past, distrust among the states and federal agencies has prevented even the development of a commonly accepted river flow model; obviously this distrust would have to be reduced in order to develop a decision support system applicable to the entire basin.

Required tasks in the Cooperative Agreement offer opportunity for the states to develop the required decision support system as well as do necessary research to better understand the linkage between flows in the Platte River and the restoration of habitat for the endangered species. A technical committee appointed by the Governance Committee will develop protocols for initiating habitat and species monitoring and research. The Governance Committee or the Water Management Committee will also develop a tracking/accounting procedure for determining depletion/accretion impacts for the three Program Water Projects and New Water Activities including water conservation/supply projects. An accounting system including water accounting procedures and supporting data requirements for tracking water contributions to the Program and the net depletive or accretive affects of new water related activities, including new wells in Nebraska and Wyoming, will be developed. These activities should form the basis for developing the necessary decision supply system and linkages between water and habitat restoration required for a recovery program.

Litigation Has Limited Potential for Resolving Water Resources Conflicts

Litigation may resolve some of the conflicts in the North Platte, but litigation is unlikely, by itself, to resolve the ESA conflicts. Litigation is probably the only way that conflicts over interpretation of the 1945 Decree for the North Platte River can be resolved. Litigation, however, is not generally an efficient process for bringing resolution to complex technical conflicts. Furthermore, litigation cannot be very effective in resolving conflicts over matters that are at best peripheral to the 1945 Decree on the North Platte River; for example, water for the endangered species habitat in the Big Bend area.

The FERC relicensing process for Kingsley Dam, which is an adversary process, has contributed little to resolving the water for endangered species recovery conflicts. FERC relicensing for Kingsley Dam also demonstrates the general inefficiency and ineffectiveness of attempting to develop mitigation

requirements for individual projects and not developing a recovery program for the endangered species in the central Platte that includes the entire Platte River basin, notwithstanding Nebraska's noteworthy efforts in bringing a wide range of water resource interests together to develop the Nebraska Alternative (including the environmental account).

Therefore, much of the frustration currently exhibited by environmentalists, the states, federal agencies, and other stakeholders toward the FERC relicensing procedures and the *Nebraska v. Wyoming* litigation for failure to develop an acceptable recovery program actually results from inappropriateness of employing litigation for the purpose of developing a recovery program. A recovery program must be developed not for just a single project in one state, but must be developed for the system as a whole and must be applicable to a range of projects including a 1.7 million acre-foot reservoir, as well as the issuance of a 404 permit for a municipal water supply intake.

References

- Aiken, J.D. 1993. *Protecting the Hidden Resource: The Quiet Crisis in Nebraska Pesticide and Ground Water Protection Policies*. Creighton Law Review 263):639-96.
- Aiken, J.D. 1980. *Nebraska Ground Water Law and Administration*. Nebraska Law Review 594):918-1000.
- Aiken, J.D. 1987. *New Directions in Nebraska Water Policy*. Nebraska Law Review 661):8-7.
- Aucoin, J. 1984. *Water in Nebraska: Use, Politics, Policies*. University of Nebraska Press. Batie, S. S. and P. L. Diebel. 1990. *Key Policy Choices in Groundwater Quality Management*. Journal of Soil and Water Conservation 452):194-97.
- Bestgen, K. R., October 1992, *The Importance of Understanding the Ecology of Plains Stream Fishes to Future Conservation Efforts*, Colorado Water Resources Research Institute.
- Bleed, Ann Salomon, May 20 through 22, 1991, *Can Negotiations Succeed? The Platte River Case*, ASCE, New York, New York.
- Bleed, A. S., December 1987, *Limitations of Concepts Used to Determine Instream Flow Requirements for Habitat Maintenance*, Institute of Agriculture and Natural Resources, University of Nebraska at Lincoln.
- Bleed, Ann Salomon, November 1989, *Platte River Conflict Resolution*, ASCE, New York, New York.
- Bouwer, H. 1990. *Agricultural Chemicals and Groundwater Quality*. Journal of Soil and Water Conservation 452):184-89.
- Burns, Alan W., 1983, *Simulated Hydrologic Effects of Possible Ground Water and Surface Water Management Alternatives In and Near the Platte River, South-Central Nebraska*, United States Geological Survey.
- Caulfield, Henry P., Jr., May 1987, *Voluntary Basin Wide Water Management: South Platte River Basin, Colorado*, Colorado State University.

- Colorado Water Resources Research Institute, September 1985, *Fiscal Year 1984 Program Report Colorado Water Resources Research Institute*), Colorado Water Resources Research Institute.
- Cooperative Agreement for Platte River Research and Other Efforts Relating to Endangered Species Habitats Along the Central Platte River, Nebraska Draft), May 1997.
- Crowley, K. P., 1981, *Large Scale Bed Forms in the Platte River Downstream from Grand Island, Nebraska: Structure Process, and Relationship to Channel Narrowing*, Water Resources Division, United States Geological Survey, Denver, Colorado.
- Decker, H. L., Kuzelka, R. D., October 1983, *Conjunctive Use First By Accident, Now By Management*, National Water Well Association.
- Dennehy, Kevin F., et al, July-August 1993, *South Platte River Basin - Colorado, Nebraska, and Wyoming*, United States Geological Survey.
- Echeverria, John D. and Paul Currier, 1997, Letter to Don Glaser, Western Water Policy Review Advisory Commission, Commenting on Draft Report, Platte River Basin Study.
- Evans, N. A., 1985, Annual Report, *Colorado Water Resources Research Institute, FY 1984-1985*, Colorado Water Resources Research Institute.
- Evans, N. A., August 1987, *Fiscal Year 1986 Program Report Colorado Water Resources Research Institute*), Colorado Water Resources Research Institute.
- Exner, M. E. and R. F. Spalding. 1987. *Groundwater Quality and Policy Options in Nebraska*. In R. L. Smith ed.), Nebraska Policy Choices 1987. Center for Applied Urban Research. College of Public Affairs and Community Service. University of Nebraska-Omaha.
- Federal Energy Regulatory Commission, Draft Environmental Impact Statement: Kingsley Dam FERC Project No. 1417) & North Platte/Keystone Diversion Dam FERC Project No. 1835) Projects, Nebraska FERC/DEIS-0063, Jan. 1992).
- Federal Energy Regulatory Commission, 1994, Revised Draft Environmental Impact Statement: Kingsley Dam FERC Project No. 1417) and North Platte/Keystone Diversion Dam FERC Project No. 1835) Projects, Nebraska FERC/REIS-0063, April 1994).

- Ferguson, R. B. and M. Moravek. 1990. *Groundwater Quality Management in Nebraska's Central Platte Valley*. *Journal of Soil and Water Conservation* 45(2):265-66.
- Fitzgerald, J. P., October 1995, *Animal and Habitat Relationships in the South Platte Basin With Emphasis on Threatened and Endangered Species*, Colorado Water Resources Research Institute.
- Fontane, D. G., October 1993, *Initiating a Decision Support System for the Platte River Basin*, Colorado Water Resources Research Institute.
- Gilliland, N. W., et al, April 1985, *Simulation and Decision Making: The Platte River Basin in Nebraska*, Department of Civil Engineering, University of Nebraska at Lincoln.
- Gilliland, Martha W., August 1986, *Engineering and Policy Making: The Platte River In Nebraska*, ASCE, New York, New York.
- Goslin, I. B., 1976, *Interstate River Compacts: Impact on Colorado*, Upper Colorado River Commission, Salt Lake City, Utah.
- Grigg, N. S., et al, May 1987, *Voluntary Basin Wide Water Management: South Platte River Basin, Colorado Revised*, Colorado Water Resources Research Institute.
- Grigg, N. S., 1984, *Voluntary Basin Wide Water Management: South Platte River Basin, Colorado*, Colorado Water Resources Research Institute.
- Hadley, R. F., Eschner, T. R., July 1982, *Effects of Water Development on the Hydrology and Morphology of Platte River Channels, South-Central Nebraska*, United States Geological Survey, Denver, Colorado.
- Hadley, R. F., et al, December 1987, *Water Development and Associated Hydrologic Changes in the Platte River, Nebraska, U.S.A.*, Department of Geology and Geography, University of Colorado at Denver.
- Hill, J. R., Jr., 1993, *Colorado Court Recognizes Federal Reserve Rights to Instream Flows in Rocky Mountain National Park*, Bratton and McClow.
- Hurr, R. Theodore, 1983, *Ground Water Hydrology On The Mormon Island Crane Meadows Wildlife Area Near Grand Island, Hall County, Nebraska*, United States Geological Survey.

- Hurr, R. T., December 1975, *Effects of Water-Management Practices on the Flow of the South Platte River, Colorado*, Water Resources Division, United States Geological Survey, Lakewood, Colorado.
- Jelinski, D.E. and P.J. Currier. August 1996. Ecological Risk Assessment Case Study. Middle Platte River Floodplain, Nebraska. Planning and Problem Formulation. Review Draft.
- Kuhnhardt, H. H., et al, 1995, *Initiating a Water Management Decision Support System for the South Platte River Basin*, Colorado Water Resources Research Institute.
- Kuzelka, R. D. and C. A. Flowerday. 1993. *Flat Water: A History of Nebraska and Its Water*. Resource Report No. 12. Conservation and Survey Division, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.
- Libby, L. W. 1990. *A Public Policy Perspective on Groundwater Quality*. Journal of Soil and Water Conservation. 45(2):190-93.
- Logan, T. J. 1990. *Agricultural Best Management Practices and Groundwater Protection*. Journal of Soil and Water Conservation 45(2):201-06.
- Lochhead, J. S., October 1995, *Colorado's Participation in Efforts to Develop a Program to Restore Habitat for Endangered Species in the Central Platte River Basin*, Colorado Water Resources Research Institute, Fort Collins, Colorado.
- Lochhead, James S., and Douglas M. Robotham, May 1997, *Briefing Report Platte River Endangered Species Program Agreement Between the States of Colorado, Nebraska and Wyoming and the Department of the Interior*, Colorado Department of Natural Resources, Denver.
- Loomis, J. R., October 1994, *The Need for Commensurability in Values of Alternative Uses of Water in Integrated Watershed Management*, Colorado Water Resources Research Institute.
- MacDonnell, Lawrence J., 1985, *Endangered Species Act and Water Development Within the South Platte Basin*, Colorado State University.
- MacDonnell, L. J., August 1988, *Integrating Tributary Ground Water Development into the Prior Appropriation System: The South Platte Experience*, Colorado Water Resources Research Institute.

- McGregor, F. R., et al, October 1995, *Lower South Platte Riparian Zone*, Colorado Water Resources Research Institute, Fort Collins, Colorado.
- Nebraska Department of Water Resources, 1995, *Biennial Report of the Department of Water Resources to the Governor of Nebraska, 1993-94*.
- Nebraska Department of Water Resources, 1996, *Channels*, Spring 1996, pp. 1-4.
- Nebraska Game and Parks Commission, 1996, *Instream Flow Settlement Options and Strategy*, pp. 1-10, 20-28.
- Nebraska Soil and Water Commission. 1971. *Report on the Framework Study*. State Water Plan Publication No. 101.
- Nebraska v. Wyoming*, 507 U.S. 584 (1993).
- Nelson, R. W., et al, 1988, *Flushing and Scouring Flows for Habitat Maintenance in Regulated Streams*, Environmental Protection Agency, Washington, D.C.
- Nielsen, E. G. and L. K. Lee. 1987. *The Magnitude and Costs of Groundwater Contamination from Agricultural Chemicals: A National Perspective*. U.S. Department of Agriculture Agricultural Economics Report No. 576.
- Pipps, T., October 1995, *The Future of Endangered Species Management in the Platte River Basin: Resolving Conflicts Between Water Development and Endangered Species Protection*, Colorado Water Resources Research Institute, Fort Collins, Colorado.
- Pitts, T., October 1993, *Water Management and Endangered Species Protection of the South Platte River Basin*, Colorado Water Resources Research Institute.
- Platte River Management Joint Study, Biology Work Group, 1989, Interim Final Report, March 31, 1989, Denver, Colorado.
- Platte River Management Joint Study, 1993, *Platte River Recovery and Conservation Program Draft*, January 15, 1993.
- Reisner, M. 1986. *Cadillac Desert: the American West and Its Disappearing Water*. Penguin Books.

- Schneider, S. A. 1990. *The Regulation of Agricultural Practices to Protect Groundwater Quality: The Nebraska Model for Controlling Nitrate Contamination*. Virginia Environmental Law Journal 101): 1-44.
- Shen, H. W., et al, November 1985, *Potential of Modified Flow-Release Rules for Kingsley Dam in Meeting Crane Habitat Requirements, Platte River, Nebraska*, Colorado Water Resources Research Institute.
- States of Colorado, Nebraska, Wyoming and the Department of the Interior, May 1997, *Cooperative Agreement for Platte River Research and Other Efforts Relating to Endangered Species Habitats Along the Central Platte River, Nebraska*, This document includes the Cooperative Agreement together with Attachment I Milestones During the Cooperative Agreement), Attachment II Water Conservation/Supply Component), Attachment III Proposed Alternative), Appendix A Water Component Including Tab 1A, 1B, 2A, 2B, 3A, 3B, and 4) and Appendix B Contributions of the Parties) and Appendix C Governance Structure).
- U.S. Army Corps of Engineers, 1995a, *Project Modification for Improvement of the Environment*, EC1105-2-206, 27 April 1995.
- U.S. Army Corps of Engineers, 1995b, *Water Resources Policies and Authorities, Ecosystem Restoration in the Civil Works Program*, Circular No. 1105-2-210, 1 June 1995.
- U.S. Army Corps of Engineers, 1995c, *Implementing Ecosystem Restoration Projects in Connection with Dredging*, Circular No. 1105-2-209, 31 August 1995.
- U.S. Army Corps of Engineers, 1996, *Draft Watershed Study Guidelines*, CECW-AA/CECW-PD, 8 August 1996.
- United States Bureau of Reclamation, 1982, *Water Use and Management in the Upper Platte River Basin, Colorado, Wyoming, Nebraska*, United States Bureau of Reclamation.
- U.S. Environmental Protection Agency. 1992. *Framework for ecological risk assessment*. Risk Assessment Forum, U.S. Environmental Protection Agency, EPA/630/R-92/001. Washington DC.
- U.S. Fish and Wildlife Service, December 1996, *Draft Biological Opinion on the Federal Energy Regulatory Commission's Preferred Alternative for the*

- Kingsley Dam Project No. 1417) and North Platte/Keystone Dam Project No. 1835), Volume I: Biological Opinion, Grand Island, Nebraska.*
- U.S. Water Resource Council, 1983a), Economic and Environmental Principles for Water and Related Land Resources), Washington, D.C.
- U.S. Water Resource Council, 1983b), Economic and Environmental Guidelines for Water and Related Land Resources Implementation Study, Chapter I-Standards), Washington, D.C.
- Van Derwalker, John G., July 1988, *Instream Flows For The Big Bend Reach Of The Platte River*, ASCE, New York, New York.
- Warner, James W., et al, November 1986, *Recharge as Augmentation in the South Platte River Basin*, Colorado Water Resources Research Institute, Fort Collins, Colorado.
- Water-Environment-Technology, 1994, *States Agree to Basin Management Plan*, Water-Environment-Technology.
- Weaver, G. D., May 1983, *Effects of Wilderness Legislation on Water Project Development in Colorado*, Colorado Water Resources Research Institute.
- Williams, G. P., 1978, *The Case of the Shrinking Channels - The North Platte and Platte Rivers in Nebraska*, Water Resources Division, United States Geological Survey, Lakewood, Colorado.
- Woodward-Clyde Consultants, 1981, *Interim Report South Platte River Basin Assessment/Prepared for the Colorado Water Conservation Board*, Woodward-Clyde Consultants.
- Zallen, Margo, 1997, *Integrating New Values With Old Uses in the Relicensing of Kingsley Dam and Related Facilities Making Part of the Problem a Part of the Solution*, Paper Presented at National Resources Law Center, University of Colorado School of Law, Boulder, Colorado, June 2-4, 1997.