6. LETTERS FROM STATE AGENCIES

This section contains 31 letters received from the State agencies listed in Table D2-5. Please note that, for the reader's convenience, this table is sorted alphabetically by the agency/sender's last name. However, comment documents are printed in numerical order by the comment identification number (first column). Responses to the comments coded (box with category and number) can be found grouped by categories in Section 4 of Volume VI, RDEIS Comments and Responses, Part 1.

Table D2-5. Summary list of comment documents received from State agencies, including response codes.

Comment ID Number	Agency/Sender's Last Name	Sender's Name	Page Number	Response Number
S0100001	State of South Dakota	Governor William J. Janklow	D2-163	Other-5,56,58
S0100002	State of Montana	Governor Judy Martz	D2-164	CR-1; Rec-25; EnSp-21,25,44,45; WQ-15,16; ErSd-22; Hydro-1,7,8,9,10,11,12,13; Other-4,61,62,82,83,84,85,125
S0100003	State of Iowa	Governor Thomas J. Vilsack	D2-167	EnSp-1,2,5,11,15; IntD-1; WQ-13; Miss-4; Hpower-4,5,6,7; Nav-6,8,12; MoPower-2; Hydro-1; Other-7,61,79,129
S0100004	State of Illinois	Governor George H. Ryan	D2-171	FC-8; Miss-4,6; Other-9
S0100005	State of Missouri	Governor Bob Holden	D2-172	EnSp-1,3; IntD-1; GW-2; FC-8,13; Miss-4,5; Hydro-16,29,30,31; Other-6,137
S0100006	State of Kansas	Governor Bill Graves	D2-175	EnSp-3,12; Nav-21,22;
S0100007	State of North Dakota	Governor John Hoeven	D2-176	EnSp-13,14; WQ-14; Hydro-14; Other-7
S0100008	State of North Dakota	Governor John Hoeven	D2-177	CR-11,15; Rec-25,26,27; EnSp-9; WQ-14; Hpower-8,9; Nav-18,19,9,11,20; Hydro-14; Other-7,61,147
S0100009	State of Wyoming	Governor Jim Geringer	D2-179	EnSp-16; Other-145
S0100010	State of Montana	Governor Judy Martz	D2-181	Other-146
S0200001	Rants	Christopher	D2-182	Rec-4,5,6; EnSp-17,18; FC-4,12
S0200002	Gross	Chuck	D2-182	EnSp-1,4,7; WQ-2; FC-6; Nav-12,23,24; MoPower-1
S0200003	Attorney General of Missouri	Jeremiah W. (Jay) Nixon	D2-184	EnSp-20,26,46,47,52,59,65; FC-1,2,4; Miss-4,19,21,42,43; Nav-6,8,23,35; MoPower-1,3,7; Hydro-46,47; Legal-21,22,23,24,25,26,27,28,29,30; Other-3,7,9,10,14,23,26,48,70,172,189,198,204,218, 304,315,316,317,318,319, 337
S0300001	State of Montana DNRC	Bud Clinch	D2-197	ErSd-5,6,7; Other-84,85,130
S0300002	South Dakota DENR	Steven M. Pirner	D2-199	Rec-8; EnSp-9,18; Fish-8; Other-76,77,78,79
S0300003	Nebraska Game & Parks Commission	Rex Amack	D2-201	Rec-6; EnSp-18; Fish-3; Other-79

Comment ID Number	Agency/Sender's Last Name	Sender's Name	Page Number	Response Number
S0300004	State of North Dakota Game & Fish Department		D2-202	Rec-7; EnSp-9,19; Fish-6,8,9; GW-1; WQ-6,7,8,9,10; FC-7; Miss-4; ErSd-33; Hpower-10; WS-5; Hydro-2; Other-17,131,132,133,134,135,36
S0300005	Missouri Department of Conservation	Jerry M. Conley	D2-203	EnSp-2,3,8,9,17,20; Fish-10; FC-2,6; Miss-17; Nav-25; Other-20,35
S0300006	State of Missouri DNR	Jerry D. Vineyard	D2-233	Tribal-8,12,13; Miss-1,4,5,18,19,20,21,22,23,24,24; Other-6,127,128,335
S0300007	State of Missouri DNR	Stephen Mahfood	D2-241	Rec-11; EnSp-1,5,20,22,29,46,47,48,53,57; WRH-12; Fish-20; IntD-8; GW-7; FC-2; Miss-13,19,26; Hpower-12; Nav-6,8,12,23,47,62,63,64; WS-11; Hydro-39; Legal-31; Other-6,7,9,26,27,39,95,138,139,140, 141,142,143
S0400001	Board of Mississippi Levee Commissioners	James Wanamaker	D2-285	Rec-3; WRH-4; FC-8; Miss-4,24
S0400002	Arkansas Waterways Commission	Melissa Myers	D2-286	Miss-5; Nav-1,23,12
S0400003	MoDOT	Henry Hungerbeeler	D2-287	Miss-5; Nav-26,27,28,6
S0400004	MoDOT	Henry Hungerbeller	D2-288	Miss-4; Nav-6,28
S0400005	MoDOT	Larry L. Brown	D2-289	Miss-5
S0400006	North Dakota State Water Commission	Dale L. Frink	D2-292	CR-2,3; Fish-6; ErSd-1; Hpower-11; Nav-29; Other-4,5,6,7,61
S0400007	State of Louisiana DOTD	Edmond J. Preau	D2-293	Miss-1,18; Other-96
S0500001	State of Missouri Dept. of Agriculture	Lowell Mohler	D2-294	EnSp-5,17; IntD-1; GW-2; FC-8; Miss-4,25; Nav-8; Other-89
S0600002	State Historical Society of North Dakota	Merlan E. Paaverud	D2-296	CR-11,12
S0600003	Montana Historical Society	Stan Wilmoth, PhD	D2-297	Legal-32; Other-148
S0600004	State Historical Society of Iowa	Daniel Higginbottom	D2-298	Other-148

S0100001

STATE OF SOUTH DAKOTA
WILLIAM J. JANKLOW, GOVERNOR

February 22, 2002

Project Manager
Master Manual Review and Update
U. S. Army Corps of Engineers
12565 West Center Road
Omaha, NE 68144

Dear Project Manager:

Thank you for the opportunity to provide comments on the Revised Draft Environmental Impact Statement for the Missouri River Master Water Control Manual. For the past twelve years, the Corps has been engaged in a process to change the management of the Missouri River. This has been a long process and South Dakota looks forward to the implementation of a new Master Manual that recognizes all uses of the Missouri River.

The current Master Manual remains largely unchanged from its development over 40 years ago. However, conditions and the vision for the river have changed dramatically. Instead of using the river for large-scale irrigation and navigation projects, people have found other uses for the river. Fishing, boating, and recreation uses have increased tenfold, and recreation is now an annual $87 million industry in the basin. Clearly, the contemporary uses of the Missouri River no longer reflect those 40-year-old visions. However, we are plagued by a Master Manual that continues to support navigation while frequently all but ignoring upper basin river uses. Therefore, the contemporary uses of the river demand that changes are made to the Master Manual and keeping the current Master Manual or current Water Control plan, as it is identified in the Revised Draft Environmental Statement, is simply not an acceptable option.

Other- 7

There are five other options that the Corps has identified for consideration. These share several common points that we strongly support. These include drought conservation measures, adaptive management, unbalancing of the upper three reservoirs and flow modifications from Fort Peck reservoir. The final changes are the proposed spring rise and low summer flows from Gavins Point Dam. Of the four alternatives in the Revised Draft Environmental Impact Statement that contain flow modifications from Gavins Point, South Dakota supports the Corps having the ability to implement the GP20/21 alternative through adaptive management. The science behind this

Other- 56, 58

EXECUTIVE OFFICE
STATE CAPITOL
500 EAST CAPITOL
PIERRE, SOUTH DAKOTA
57501-5070
605-773-3212

alternative has gained nearly universal support from the technical fish and wildlife community. This alternative also provides maximum recreational benefits for South Dakota. The Missouri River recreation is critical to South Dakota's economy and quality of life.

Other- 56, 58

Again, thank you for the opportunity to comment on the Revised Draft Environmental Impact Statement. We look forward to working with the Corps and the other basin states to implement a new Master Manual that recognizes the beneficial uses that exist throughout the entire Missouri River basin.

Sincerely,

William J. Janklow

WJJ:dsp

cc: The Honorable Tom Daschle
United States Senator
SH-509 Hart Senate Office Building
Washington, DC 20510-4103

The Honorable Tim Johnson
United States Senator
SH-502 Hart Senate Office Building
Washington, DC 20510-4104

The Honorable John Thune
United States Representative
1005 Longworth House Office Building
Washington, DC 20515-4101

Brigadier General David A. Fastabend
Commander, Northwestern Division
U. S. Army Corps of Engineers
PO Box 2870
Portland, OR 97208-2870

S0100002

OFFICE OF THE GOVERNOR

STATE OF MONTANA

JUDY MARTZ
GOVERNOR

STATE CAPITOL
PO BOX 200801
HELENA, MONTANA 59620-0801

February 27, 2002

U.S. Army Corps of Engineers
Northwestern Division
12565 West Center Road
Omaha, Nebraska 68144-3869
Attention: Missouri River Master Manual RDEIS

Dear Sir or Madam:

I would like to thank the Corps of Engineers for allowing us the opportunity to comment on the Revised Draft Environmental Impact Statement (RDEIS) for the Missouri River Master Water Control Manual. The following are issues and concerns that Montana has identified based on our review of the RDEIS and additional data provided by the Corps. Our comments are focused on Fort Peck Reservoir and the downstream river channel into Lake Sakakawea.

Bud Clinch, my director for the Department of Natural Resources and Conservation, has worked very hard as a member and president of the Missouri River Basin Association over the past five years to achieve consensus on a preferred alternative. Even though it was not possible to achieve absolute consensus, seven of the eight basin states did agree on an acceptable alternative in 1999, which was a first. Montana did everything in its power to work toward consensus. We were even willing to step up to the plate and accept a ten-year spring rise demonstration project. It is of interest to note that the proportional increase in spring rise flow proposed at Fort Peck is three to four times greater than the spring flow proposed below Gavins Point.

Hydro-1

Montana had hoped that the Corps would have been more reasonable and fair to Montana in selecting alternatives in the RDEIS. We wanted an alternative that provided reservoir levels at Fort Peck that are comparable with those being proposed for Sakakewea and Oahe. We wanted a spring rise from Fort Peck dam that stimulates successful spawning of the endangered Pallid Sturgeon with good scientific monitoring. In turn, the impacts from the spring rise must be mitigated in the downstream river channel and higher water levels maintained in Fort Peck Reservoir. Further, we wanted the Corps to satisfy the requirements of the Federal Clean Water Act by meeting Montana's water quality standards as well as working with the State to develop and

Hydro-7
Other- 62
WQ 15

TELEPHONE: (406) 444-3111 FAX: (406) 444-4151

implement Total Maximum Daily Load (TMDL) restoration plans within Fort Peck Reservoir and the river channel below the dam.

WQ 15

We have organized our comments below in the categories recommended by the Corps.

The EIS Process

We had hoped the Corps would have defined a preferred alternative in the RDEIS. By waiting to select a preferred alternative in the final EIS document, Montana and the other basin states may not have the opportunity to provide meaningful comments on a preferred alternative.

Other- 125

Corrections to RDEIS GP Model Runs

We learned recently that lake level and flow output for Fort Peck and the stretch of river below the dam is flawed for the GP alternatives. Our analysis of the daily flow data for the GP alternatives for the summer months of the 1987-1993 drought period reveals the curious repeated appearance of discharge levels of 11,900 cfs. For the GP15/28 alternative, each of the 217 days in July and 140 of the 217 days in August for this period has estimated average daily flows of 11,900 cfs (compared to median July and August flows of 3,650 cfs and 3,870 cfs, respectively, for the Current Water Control Plan). Clearly, overestimates of summer releases from Fort Peck are likely to have implications for Fort Peck as well as for the rest of the system.

Hydro-7

Tremendous effort has been expended by the Corps in developing a model that allows comparisons of the relative effects of various operational schemes. Analysis of the data generated by the model for prospective alternatives provides us with a basis to make informed decisions regarding impacts of managing a complex river system. To learn that data for four of the six alternatives under consideration in the RDEIS contain substantial errors during a critical period seriously impairs our ability to make informed decisions regarding the preferred alternative. We hope the Corps will correct the problems with the model and address our concerns associated with Fort Peck reservoir levels and the proposed spring rise.

Suggestions for Preferred Alternative

None of the alternatives as described in the RDEIS are acceptable to Montana. An alternative that would be acceptable is the 1994 Preferred Alternative. At that time, the Corps did a very good job of balancing the needs of the individual states based on the federally authorized purposes. Montana would also be willing to accept the GP15/28 alternative if it maintains a higher effective permanent pool in Fort Peck Reservoir during drought and would counterbalance the loss of stored water caused by the spring rise.

Other- 61

Adaptive Management

We support the concept of adaptive management as long as all the basin states and water users that reside along the river can be involved in adaptive management decisions. Adaptive management should be used to evaluate operations to minimize

Other- 85

U.S. Army Corps of Engineers
February 27, 2002
Page 3

damage from dam operations on uses such as water supply, flood control, hydropower, recreation and irrigation in the upper basin and to protect endangered species. Further, Montana supports the creation of an Upper Missouri River Advisory Council (discussed below) to provide input into the adaptive management decisions for the river stretch between Fort Peck Dam and Lake Saskakawea and from the Fort Peck Reservoir Advisory Council for decisions affecting Fort Peck Reservoir.

Other- 85

Drought Conservation Measures

We find unacceptable the conservation measures that are being proposed for implementation at Fort Peck Reservoir under all of the proposed alternatives as described in the RDEIS. During the 1980s drought, Fort Peck will be no better off under any of the proposed alternatives than it is under the existing Master Manual and would be nine feet worse than under the 1994 Preferred Alternative. Under the most favorable alternative to Montana--the Modified Conservation Plan, Fort Peck Reservoir could still be drawn down to 2209' –the lowest level experienced during the 1980s drought which was clearly unacceptable. Under the other four proposed alternatives, which are all tied to releases from Gavins Point, the reservoir can be drawn down three feet further to 2206', which is the same level under the Current Water Control Plan.

Other- 84

We noticed that under the proposed alternatives both North Dakota and South Dakota fared considerably better than Montana in maintaining higher reservoir levels during drought even though we were willing to accept a spring rise from Fort Peck. During the 1980s drought, Lake Sakakawea would gain from 4' to 6' under the five proposed alternatives as compared to the Current Water Control Plan and 2' to 4' above the lowest level of 1815' reached in the drought. Lake Oahe would gain from 1' to 5' under the five proposed alternatives as compared to the Current Water Control Plan and 5' to 9' above the lowest level of 1581' experienced in the 1980s drought.

Other - 84

The Corps needs to maintain higher reservoir levels in Fort Peck by incorporating greater conservation measures during drought and by mitigating stored releases for the spring rise. We want to thank General Fastabend for his January 22, 2002, letter to Bud Clinch, but we still need to see the model corrected and the GP alternatives rerun to be sure that Fort Peck reservoir levels are comparable to those in Sakakawea and Oahe during the 1080s drought.

Fort Peck Spring Rise

The State only agreed to accept the spring rise demonstration proposal from Fort Peck Dam as long as there were measures to mitigate the impacts of the spring rise to lake levels and downstream river banks. We would like to know what these mitigation measures are prior to any spring rise discharges. For example, the RDEIS does not address the impacts that the spring rise will have on two-thirds of the 143 irrigation pump sites located in the river channel downstream of the dam. These impacts need to be quantified, especially in light of the fact that the Corps does not consider itself liable for damages.

Other - 83

U.S. Army Corps of Engineers
February 27, 2002
Page 4

Further, The Dry Prairie Rural Water Authority and the Fort Peck Tribes will soon begin constructing the Fort Peck Reservation Rural Water System. The project will divert Missouri River water near Poplar, Montana to supply all municipal and rural drinking water needs on and off Fort Peck Reservation in a four county area of northeast Montana. The Corps will need to work closely with the local authority to make sure the intake structure and related facilities are protected during the spring rise.

Hydro-8

The RDEIS should also include a "Stop Protocol" that can be immediately instituted to protect life and property downstream of Fort Peck dam before and during the spring rise. Criteria under the stop protocol to preclude a spring rise should include:

- when Garrison pool levels will contribute to flooding;
- when Yellowstone, Milk River or other tributary runoff will result in flooding in the Missouri;
- when downstream target temperatures are not attainable with existing reservoir water surface temperatures; and
- when reduction in hydropower will contribute to severe power shortages.

Hydro-9

Other considerations that the Corps should consider before initiating a spring rise include: safety of the Fort Peck spillway, downstream safety in the river channel, cultural resource impacts, out of bank flooding (greater than 60,000 cfs) and impact to lake levels (i.e., stored water in advance of spring rise).

CR 1
Hydro-9,10,11

Endangered Species

We support a spring rise that will trigger the spawning of pallid sturgeon as long as it is likely to be effective and includes mitigation for impacts to lake levels and the river banks and structures downstream. To document successful spawning and rearing, good scientific monitoring will be a necessity. The State's fisheries personnel question whether the spring rise will be high enough to stimulate successful spawning. If the monitoring data suggest that the spring rise is not high enough to stimulate spawning, they would like to see a higher spring rise (i.e., adaptive management).

EnSp 21

If a higher spring rise is required, the downstream water users would like to see additional mitigation implemented to protect the channel from erosion and measures taken to protect pump sites and associated infrastructure. The Corps should set these higher flow levels in consultation with State fisheries personnel, local water users, local government, Fort Peck Tribes, and the U.S. Fish and Wildlife Service. The impacts of higher flows must be determined by using a more accurate flow model, which will need to be developed and tested with data from the mini-test and full-test.

We would like the Corps to work with the U.S. Bureau of Reclamation to improve Pallid Sturgeon spawning in the Yellowstone River. Since the Yellowstone River has a more natural flow regime, it may have more natural stimuli to initiate spawning in the river channel and tributaries. Therefore, more efforts should be devoted to this alternative. This could help mitigate some of the impacts of Fort Peck Dam and its operations on Pallid Sturgeon spawning in the Missouri River.

EnSp
25,44,45

Missouri River Erosion and Sedimentation

The State challenges the Corps statement in the Summary that states, "The study [the Corps 1995 erosion study] found no relationship between the annual distribution of flows and the erosion of channel features affected by sediment erosion and deposition. Erosion was found to be more of a function of the total annual volume and not the distribution of that volume." The entrainment of sediment downstream of Fort Peck Dam, and the effect of a spring rise at Fort Peck could have a significant effect on entrainment and movement of sediment downstream of the dam and therefore, on erosion. We would like the Corps to reconsider this statement in light of the science of sedimentation from large rivers. The Corps should conduct a geomorphologic study of the river channel, similar to the ongoing investigations between the Corps and the State of Montana for the Yellowstone River.

ErSd 22

We are concerned about the Corps' September 28, 2001 decision not to conduct a separate environmental assessment for the "full test" of the spring rise and the Corps statement that the RDEIS adequately addresses its impacts. Since to the best of our knowledge, a geomorphology assessment of the river channel has not been completed, it is very difficult for us to understand this decision. Our understanding was that results of the mini-test were expected to be useful in conducting the environmental assessment for the full test. Please include in the final EIS, the relevant information and justification that lead the Corps to this decision.

Hydro-12

High winters releases, and especially under the ice, have been shown to cause problems to the channel and banks in the river below the dam. While we recognize the benefits of winter hydropower production, we urge that the detrimental impacts in deriving such benefits be given appropriate consideration as well. To decrease impacts to lake levels at Fort Peck and to the river channel and banks below the dam, winter releases from Fort Peck should not exceed 9,000 cfs. In adopting a spring rise at Fort Peck, we are adjusting operations toward a more natural hydrograph at some cost to Montanans. We feel strongly that it is only fair to adopt a more natural hydrograph–in the form of lower winter releases–when they benefit Montanans as well.

Hydro-13

Water Quality

We are unclear in our review whether the Corps determined that the operation of Fort Peck Reservoir levels and releases of water from the dam will not further impair beneficial uses within the reservoir and downstream in the river. Because the reservoir and the downstream river have already been identified as impaired by the State of Montana, we would like to know with reasonable confidence how the revised operations of the dam will improve water quality in the reservoir and downstream in the river.

WQ 16

Our water quality personnel have determined that the Missouri River downstream of Fort Peck Dam does not fully support aquatic life, fisheries and drinking water. The State is required by federal law to develop Total Maximum Daily Load (TMDL)

restoration plans and associated targets for the reservoir. We want to ensure that the operation of Fort Peck Reservoir will not further impact aquatic life, fisheries and drinking water and that the new operations of Fort Peck Reservoir will actually help achieve the TMDL targets (i.e., water quality standards). Parameters that the State is concerned about include; mercury; temperature; suspended sediments; metals and nontraditional water quality parameters such as riparian habitat (cottonwood communities), riverbank stability and erosion.

WQ 15

Recreation Use

Under the proposed alternatives, it appears that Fort Peck Reservoir can be drawn down significantly–to those levels experienced in the 1980s drought. With these low reservoir levels, the recreation and tourism economy around Fort Peck Reservoir will be harmed. The State would like the Corps to explain the reasons that it shows a slight increase in recreation benefits when the reservoir levels will drop significantly under the alternatives.

Rec 25

Further, to help mitigate the impacts of the new operations of Fort Peck, we would like the Corps to continue supporting the Fort Peck fish hatchery. The hatchery will enhance the recreational fishing on Fort Peck Lake while not impacting the flow regime.

Other Economic Uses

We would like the Corps to include the National Economic Development (NED) benefits of the different alternatives to the individual states as you did in the 1994 Draft EIS. The information was very useful in assessing the relative effects of the alternatives on each state.

Other- 82

The spring rise could have significant effects on the agricultural economy downstream of Fort Peck dam. The spring rise will cause many irrigators to remove their pumps from the river, which in turn will prevent them from irrigating some of the 56,000 irrigated acres between Fort Peck and the Montana border with North Dakota. Removing this large number of acres from irrigation–where a large portion of the land is used to grow cash crops such as sugar beets–will have a significant effect on the economy of northeastern Montana. The NED estimates for water supply do not appear to reflect the impact of the Fort Peck spring rise.

None of the Listed Categories

We support the Corps proposal to unbalance the operation of water levels in the three upper basin reservoirs as long as it does not occur during an extended drought or when there is a high probability of flooding.

The Corps has done an excellent job of managing issues around Fork Peck Reservoir with its staff at Fort Peck, but has no one to address river channel and flow issues between Fort Peck Dam and Lake Sakakewea. We would like the Corps to help create the Upper Missouri River Advisory Council. The Council should consist of water users along the river in Montana and North Dakota and officials from state governments of North Dakota and Montana, the Fort Peck Tribes, the U.S. Fish and Wildlife Service,

Other- 85

EPA and the Corps of Engineers. A high level Corps person from Omaha will need to represent the Corps on the Council. A River Manager would need to be hired by the Council, but funded by the Corps. The primary duties of the river manager would be to staff the council. The Council would address issues and concerns in the Missouri River channel downstream of Fork Peck reservoir to Lake Sakakawea. Issues would include:

Other- 85

- Stop protocol procedures and criteria for the spring rise;
- Warning procedures for the spring rise;
- Recreation access sites;
- Funding needs;
- Fish, wildlife and water quality concerns; and
- Bank stabilization and other issues.

In Summary, I submit these comments on behalf of Montana with appreciation for the formidable task you and your staff face in deciding how to best manage such a vast and intricate river system as the Missouri. The difficulty of this task is compounded in dry years such as we are currently experiencing. We hope that you consider these comments as constructive for improving the management of the Missouri River Basin.

Other- 4, 83

I also feel that the proposed mitigation measures that are identified in this letter are comparable to those required by FERC of any private hydropower facilities on large rivers (i.e. Avista on the Clark Fork). These measures are not costly, are consistent with the recent recommendations of the National Research Council for the Missouri River and will go a long ways to improve the overall management of the Upper Missouri River Basin.

Sincerely,

JUDY MARTZ
Governor

cc. Senator Max Baucus
Senator Conrad Burns
Representative Dennis Rehberg
Brigadier General David Fastabend, Commander, NW Division, Corps
Bud Clinch, Director, MT Dept. Natural Resource and Conservation
Jeff Hagener, Director, MT Dept. Fish, Wildlife and Parks
Jan Sensibaugh, Director, MT Dept. Environmental Quality
Richard Opper, Executive Director, MRBA
Don Pfau, Chair, Fort Peck Advisory Council
Buzz Mattelin, Lower Missouri River CRM

S0100003

THOMAS J. VILSACK
GOVERNOR

OFFICE OF THE GOVERNOR

SALLY J. PEDERSON
LT. GOVERNOR

February 27, 2002

Brigadier General David A. Fastabend
U.S. Army Corps of Engineers, Northwestern Division
Attention: Missouri River Master Manual RDEIS
12565 West Center Road
Omaha, NE 68144-3869

FAX # 402-697-2504

Dear Brigadier General Fastabend:

The State of Iowa receives a wealth of benefits from the Missouri River. The river's natural resources provide a source of drinking water, fish and wildlife habitat, rich floodplain soil, and water-based outdoor recreation opportunities. Economic benefits come in the form of energy production, flood control, commercial navigation, bank stabilization, and recreation expenditures. These developments support cities and agriculture along the river. However, the benefits have not come without consequences, many of which we are just beginning to realize and understand. Some fish and wildlife species are struggling and finding it difficult to adapt to reduced and changing habitat. Riverbed degradation between Sioux City and Council Bluffs adversely affects water intakes, marinas, and boat ramps. Below Council Bluffs, aggradation of the riverbed and land riverward of the levees is increasingly posing drainage complications for farmers in the floodplain.

The relationship between the Missouri and Mississippi Rivers is important to the State of Iowa. The Mississippi River forms our entire east boundary and provides an avenue for our waterborne commerce between St. Paul and New Orleans. While Missouri River flow does not impact the segment of the Mississippi River along Iowa, it does affect the efficiency of the navigation channel down river from St. Louis. We are interested in the impacts of Missouri River operations on the Mississippi and avoiding disruption to flow levels of the Mississippi River to the extent practicable. We commend the Corps of Engineers for including an analysis of Mississippi River impacts in its RDEIS. Periods of history have occasionally occurred when the Upper Mississippi River Basin was in a drought while the Missouri River was receiving excessively high runoff. During situations like this in the future, Iowa supports releasing excess Missouri River water in a manner that will maximize benefits to the Mississippi River. This water would come from the Missouri River Mainstem Reservoir System's annual flood control and multiple use zone that the Master Manual calls for being emptied by the beginning of the next flood season.

Miss 4

STATE CAPITOL DES MOINES, IOWA 50319 515 281-5211 FAX 515-281-6611

The Revised Draft Environmental Impact Statement (RDEIS) lists three basic goals to guide revisions to the Master Manual: (1) serve Congressionally authorized project purposes; (2) comply with current environmental laws; and (3) serve the contemporary needs of the basin. Iowa agrees with this trio of goals. Iowa will not support changes that dismiss any of the existing project purposes. We also understand the need to adhere to the National Environmental Policy Act (NEPA) and the Endangered Species Act (ESA). An updated Master Manual must function to get the listed species out of jeopardy. And last, we realize periodic updates of the Master Manual are necessary for river operations to stay current with new and shifting demands placed on the resource.

Other- 7

Periods of drought in the basin are trying times for all river users. The drought in the late 1980s proved especially difficult by causing considerable economic hardship for the upper basin states that contain the mainstem reservoirs. The Corps of Engineers agreed that discussions among representatives of all river uses would be needed to develop a new drought management plan for the river. The Corps sought the help of the Missouri River Basin Association to receive input from users throughout the basin. The Association held several meetings and hosted a series of basinwide conferences to work on the issues. The State of Iowa played an active role in the Association while it developed a set of recommendations that was forwarded to the Corps of Engineers in a letter dated November 19, 1999 to Brigadier General Carl A. Strock. Iowa continues to stand behind that original position.

Other- 61

Changes proposed by the Association would generally function to implement water conservation earlier in a drought than currently prescribed in the Master Manual. With early conservation, the reservoirs will recover more quickly when normal or above normal snowpack and rains return to the basin. This means all river uses will be able to return to normal operations sooner by being more conservative at the onset of a drought.

The State of Iowa continues to support the recommendations presented in the November 19, 1999 letter. We are pleased that the Corps of Engineers incorporated many of the recommendations into five of its six alternatives presented in the RDEIS. The only alternative excluding these recommendations is the one that maintains the current water control plan. The State of Iowa, however, continues to be concerned about the flow changes proposed in the four GP alternatives and the impact they will have on the state and its economy. We, therefore, cannot support the more recent amendments made by the Association to that original letter.

In addition to addressing drought flow management, the November 19 letter contains a set of environmental recommendations designed to address endangered species issues. The environmental elements of the letter include:

EnSp 11

- creating a basinwide recovery committee for endangered species;

- unbalancing water elevations in the three uppermost mainstem reservoirs;
- avoiding when possible water releases greater than is needed for full service navigation at the Kansas City target from August 1 to September 15;
- implementing on a trial basis fish enhancement flows below Fort Peck Reservoir;
- increasing efforts directed at fish and wildlife habitat acquisition and enhancement; and
- instituting a comprehensive, basinwide biological and hydrologic monitoring program.

The U.S. Fish and Wildlife Service agrees with these recommendations, and we appreciate that the bulk of them are included in its Biological Opinion. However, the Service concludes that the recommendations do not go far enough to get the endangered species out of jeopardy. The missing element, according to the Service, is changes in flow releases out of Gavins Point Dam to provide a spring rise and low summer flow down river. The Basin Association did not include flow changes below Gavins Point in its recommendations, but rather suggested that the Recovery Committee "investigate the benefits and adverse impacts of flow adjustments to the existing uses of the river system."

EnSp 11

The Service's Biological Opinion describes the restoration of fish and wildlife habitat as being a vital component of recovering endangered species. Ecologists are gaining extensive knowledge on the environmental value of a river being able to routinely connect with its floodplain. Shallow aquatic areas with relatively quiet waters provide important refuge and feeding habitat for fish and wildlife during their various life stages. A river's ability to create, destruct, and shift sand bars is another component of a sustainable, healthy river ecosystem. The State of Iowa supports accelerating the Missouri River Fish and Wildlife Mitigation Project to restore as much habitat as practical.

The State of Iowa respects the Service's opinion that increased habitat and flow changes below Gavins Point are needed to thoroughly address endangered species concerns. However, we oppose the inclusion of a spring rise and low summer flow into the Master Manual. While scientific evidence suggests flow changes may improve the condition of the species, uncertainty still remains on the specific extent and duration of the spring rise and low summer flow that will in fact reverse the current fate of the least tern, piping plover, and pallid sturgeon. This uncertainty prevents us from accepting the adverse impacts identified in the RDEIS that flow changes will place on the river's existing uses. In addition, we believe all alternatives for addressing the needs of the endangered species should be explored before implementing flow changes that will have adverse impacts on other river uses. Therefore, the alternative in the RDEIS that Iowa supports at this time is the Modified Conservation Plan (MCP).

EnSp 2,5, 15
Other 79

Representatives from the following state agencies in Iowa reviewed the RDEIS:

- Governor's Office
- Department of Agriculture and Land Stewardship
- Attorney General's Office
- Department of Economic Development
- Department of Natural Resources
- Department of Transportation
- Iowa Utilities Board

Staff members concentrated on the portions of the RDEIS that pertain to their respective disciplines and areas of expertise. The following are comments that were generated from this review.

Water Supply and Water Quality

The availability of a dependable supply of public drinking water is Iowa's top priority for Missouri River water. All alternatives are expected to have minimal impact on water supply and water quality in Iowa. Water quality based permit limits are calculated using the annual seven-day, ten-year flow (7Q10) of 10,100 cubic feet per second (cfs) at Sioux City. These limits apply year-round and do not consider seasonal deviations in river flow. Therefore, all the alternatives presented in the RDEIS would result in summer low flows that are well above the 10,100 cfs limit.

WQ 13

Hydro 1

Navigation

The RDEIS does not fully assess the economic benefits of navigation or the economic impacts of those alternatives that result in reduced navigation service. No analysis has been made of the modal competition effects on total transportation cost. If the river was not there, rail and truck freight rates would be higher, so there is a National Economic Development (NED) benefit that extends to some portion of rail transported goods where the river has influenced the rates. If service interruptions make river transportation less reliable, there is less competitive pressure on rail and truck freight rates. These rate effects, in addition to the economic and environmental effects of diverting freight from the river, need to be included in the analysis of total navigation effects.

Nav 6, 8, 12

Navigation on the Missouri River is a seasonal enterprise. A significant part of the cost of operating in this environment is in start-up and shutdown staging of fleets on the river. Adding summer service interruptions would require an additional cycle each year, making the financial viability of operations more precarious. Some navigators have said that frequent summer interruptions would mean the end of navigation on the Missouri River. In addition, lower summer flows could negatively impact Mississippi River navigation. The impacts of this consequence, both direct and indirect through the loss of modal competition, should be included in the analysis of alternatives.

Electricity Supply Impacts

Shifting Missouri River water flows from summer to spring has consequences for the electricity supply serving Iowa consumers. These consequences may have economic and environmental aspects.

Release of water through any of the six Missouri River dams generates hydroelectric energy that is used to supply customers throughout the region. One of the physical properties of electricity is that production and usage must be instantaneous because there is no ability to store power for later use. The RDEIS recognizes that electricity has higher value in the peak-demand summer months than in moderate-use spring months. The EIS estimates the value of this difference by using standard electricity contract traded on the New York Mercantile Exchange. This contract is for delivery over a month. Power generated by the Missouri River dams is sold by the Western Area Power Administration (WAPA) in both monthly and hourly transactions. We have questioned whether the hourly prices for summer-peaking generation are reflected in the values calculated in Chapter 7.10 and presented in Tables 7.10-3 and 7.10-9. WAPA believes the monthly contract fairly represents averages of hourly values, but has not supported this key hypothesis.

HPower 4

Any reduction of hydropower during the summer peak must be replaced by other generation, most likely by fossil-fired plants located east of the Missouri Basin. The RDEIS is silent on the air emissions that result from additional generation. If the generation occurs east of the Mississippi River, it may well be in non-attainment areas. We would welcome additional analysis in this area.

HPower 5

The monthly capacity figures shown in Table 7.10-2 may be misleading if the study assumes that capacity could be used every month. Because hydro capacity is replenished annually, primarily by winter snowpack, the reality is that once water is released, the related capacity is unavailable until the following year. Table 7.10-2 seems to imply that capacity is retained throughout the year.

HPower 6

The power put "at-risk" by reduced summer flows impacts Iowa resources disproportionately. Tables 7.10-5 and 7.10-7 clearly show the highest impacts of the GP1521 and GP2021 alternatives in the Sioux City to Omaha reach of the river. Affected plants in this reach are the Neal plants at Sergeant Bluff and the Council Bluffs Energy Center. These plants provide a major portion of MidAmerican Energy supply, serving Sioux City, Des Moines, Council Bluffs, Fort Dodge, and Waterloo. The Draft EIS estimates that reduced summer flows would put at least twenty times as much of Iowa's capacity and energy at risk as the Current Water Control Plan and at least six times as the other alternatives.

MoPower 2

Profits from the sale of energy generated by the Missouri River hydropower facilities are used to reimburse the federal treasury. Congress specifies the rate of reimbursement. If changes in Missouri River operations adversely impact hydropower revenues, Congress should reduce the rate at which the federal treasury is reimbursed rather than local consumers being faced with higher energy costs.

HPower 7

Interior Drainage of Agriculture Land

Interior drainage remains the primary concern of agriculture interests in Iowa. Riverbed and floodplain aggradation is making it increasingly difficult for farmers to get successful crops from low-lying fields along the river. Rises of river levels in the spring exacerbate the problem by putting drainage systems more at risk. Agricultural producers facing this situation currently have few alternatives to counter this adversity. In addition to the impact on landowners in front of the levee system along the Missouri River, landowners behind the levee are also impacted as a result of higher river levels impeding the ability of drainage systems to operate as they were designed.

IntD 1

Many farmers along the Missouri River that regularly experience drainage problems on their agricultural land are expressing interest in selling their property or entering into perpetual wetland easements. The Corps of Engineers Fish and Wildlife Mitigation Project provides an avenue for those landowners interested in selling, while the Natural Resource Conservation Service's (NRCS) wetland easement programs are available to those interested in easements. A common occurrence is a landowner signing up for a perpetual easement with NRCS and subsequently deciding to outright sell the property. In this situation, the Corps can use the Mitigation Project to purchase the residual rights from the landowner. This works best when the Corps and NRCS coordinate their respective appraisals to assure the landowner receives the appropriate market value of the property. Unfortunately, this coordination appears lacking at the present time.

Other- 129

Additionally, land appraisals in most cases fall far short of current values. More landowners may be willing to sell their property if the Corps of Engineers would use appraisal methods that are more in line with NRCS appraisals. Other landowners, after deciding to participate in one of the programs, are faced with being placed on a waiting list because available funds are not keeping pace with current demand. These programs must be fully funded before any flow regime changes are considered.

Fish and Wildlife

Developments extensively altered the natural character of the Missouri River and it comes at no surprise that species associated with the river are adversely impacted at very significant levels. All species associated with the river are a concern, not just those currently on the endangered and threatened list. A comprehensive approach to restore river habitat and river dynamics is needed in a way that takes into consideration all species and river uses. The current Fish and Wildlife Mitigation Project will undoubtedly benefit

EnSp 1

endangered species. An expanded mitigation program in terms of acreage and funding will further complement habitat needs. However, the program must continue to address the needs of all species.

EnSp 1

In closing, the State of Iowa appreciates having the opportunity to review the RDEIS. We particularly appreciate the Corps of Engineers' commitment to assuring that everyone has more than ample time for its review and comment. While a six-month public comment period far exceeds NEPA requirements, the high level of public interest and emotions on the Missouri River's future justify the longer time. The numerous public workshops/hearings held throughout the basin and along the Mississippi River have given the general public, river stakeholders, and all other river interests plenty of convenient opportunity to understand the issues and provide comments. We urge the Corps of Engineers to maintain the current schedule that calls for implementing the revised Master Manual by March 2003.

Thank you for the opportunity to provide these comments. The State of Iowa remains committed to being an active player in coordinated management of the Missouri River.

Sincerely,

Thomas J. Vilsack
Governor

Cc: Ralph Morgenweck
Region 6, U.S. Fish and Wildlife Service
P.O. Box 25486
Lakewood, CO 80228

Richard Opper
Missouri River Basin Association
P.O. Box 301
Lewiston, MT 59457-0301

S0100004

OFFICE OF THE GOVERNOR
JRTC, 100 WEST RANDOLPH, SUITE 16
CHICAGO, ILLINOIS 60601

GEORGE H. RYAN
GOVERNOR

February 28, 2002

U.S. Army Corps of Engineers
Northwestern Division
12565 West Center Road
Omaha, NE 68144-3869

Attention: Missouri River Master Manual RDEIS

This letter is intended to express my concern related to your upcoming selection of a preferred plan for the Missouri River Master Water Control Manual. While I understand and appreciate the important environmental causes which the Corps has been directed to address, I have an obligation to raise concerns about the potential economic impact which the selection of a new management alternative could hold for the industries in Illinois who are reliant on navigation through the Middle Mississippi River. I must emphasize the essential need to fully evaluate the economic impact that could be created by changes to the Current Water Control Plan (CWCP). Specifically, changing from the CWCP to one of the proposed alternative operating plans poses a potential significant risk of causing irreparable personal and financial losses by commerce along the Mississippi River from St. Louis to Cairo. The potential negative ramifications fall in the following two areas:

Miss 4

(1) A direct negative economic impact on barge operations along the middle Mississippi River, as a result of reduced summer flow options; and
(2) Possible increased flooding as a result of any Gavins Point Dam options which specifically call for a spring rise.

FC 8

In March of 2001, I joined eight of my fellow Governors along the Mississippi River in asking President Bush to ensure full assessment of the impact any changes to Missouri River flow would have on States along the Mississippi. This request has not yet been fulfilled. Let me reiterate that it is essential that economic and environmental impact studies, specifically related to the Mississippi River, be completed for <u>each</u> alternative water control plan identified by the Army Corps of Engineers before any final determination can be made. I therefore respectfully request that the Corps conduct and publicize economic impact studies and depletion assessments for <u>every</u> water control plan identified in the Revised Draft Environmental Impact Statement before any plan is selected or implemented.

Other 9

With respect to Middle Mississippi navigation and barge operations, it is difficult to imagine that restrictions on water releases from the Gavins Point Dam during the summer months will not have negative impacts on commerce along the Mississippi River. At this time, I am concerned with what appears to be a significant difference of opinion between the Corps' preliminary projections of economic impacts, (which have not yet been developed for every option), and the projections made by major stakeholders along the Mississippi River. For example, the Corps has indicated that benefits provided by

Miss 26

lengthening the average navigation season will offset the industries' losses caused by reduced navigation due to restricted flows in the summer months. In contrast, an Archer Daniels Midland Company subsidiary corporation, American River Transportation Company (ARTC), has conducted assessments based on the Corps' data which quantifies potential negative economic impacts on middle Mississippi barge operations. ARTC estimates that Illinois businesses that are reliant on river navigation stand to lose between $7.5 million and $30 million per year. ARTC further maintains these losses cannot be recovered by an extension of the average navigation season. This estimate is clearly cause for concern by the State of Illinois, and demonstrates the necessity for impeccably thorough economic impact analyses.

Miss 26 (cont)

With respect to potential flood damage, it is difficult to imagine that increasing flows along the Missouri River can occur without a concomitant impact along the Mississippi River. With the devastation seen in recent years in Illinois communities impacted by floodwaters, I am wary of changes to Water Control Plans that could lead to or increase the severity of flooding along the Illinois borders. As you are well aware, the floods have devastating effects on agriculture, commerce and industry, jobs, residential communities, public facilities, transportation, utilities, etc. For example, according to Corps data, the flood of 1993 caused $752 million in damages to the State of Illinois. Although I recognize that the 1993 flood was an anomaly, I must emphasize that any increase in flood damages is unacceptable.

FC 8

In summary, I would like to thank the Corps for their willingness to provide detail and explanation of their studies to date through a personal briefing to my staff and Illinois industry representatives. I also commend the organization for providing the opportunity for public and private stakeholders to review and comment on the Revised Draft Environmental Impact Statement. I urge you to continue to study in great detail the potential transportation and economic impacts to the middle Mississippi River associated with each of the water flow release alternatives being considered for the Missouri River before a final alternative is selected.

Thank you for your consideration.

Sincerely,

GEORGE H. RYAN
Governor

Attachment

GHR/DCCA/KCB

S0100005

OFFICE OF THE GOVERNOR
STATE OF MISSOURI
JEFFERSON CITY
(573) 751-3222
www.gov.state.mo.us

BOB HOLDEN
GOVERNOR

ROOM 216
STATE CAPITOL
65101

February 28, 2002

BG David A. Fastabend, Commander
Northwestern Division Engineer
U.S. Army Corps of Engineers
Northwestern Division
P.O. Box 2870
Portland, OR 97208-2870

Dear General Fastabend:

The State of Missouri is gravely concerned about the future of the Missouri River. The Missouri River is an invaluable resource, playing a central role in how Missourians live, work, and play. Each day, the Missouri River helps drive the economy of the entire Midwest, while also quietly supporting an array of basic services expected in a civilized society including agriculture, navigation, hydropower, industry, water supply, recreation and fish and wildlife conservation. The federal government has an unquestioned duty to manage the Missouri River in a manner that adequately supports the wide variety of Congressionally-authorized river uses.

The State of Missouri fundamentally disagrees with the notion that the Corps must choose to either sustain current uses or opt to improve the Missouri River's environmental health. This is a false choice. We believe the goal of this process must be to improve the health of the Missouri River while adequately supporting all Congressionally-authorized river uses. We can, and indeed we must, find a solution that achieves both of these goals.

Other 6

Missouri recognizes that man-made changes to the Missouri River, including the inundation of the river by the creation of upstream reservoirs and the increased channelization of the river, have caused a reduction in riverine habitat. As stewards of these resources for our children and grandchildren, we have an undeniable responsibility to address this loss of habitat. I believe that the best way to accomplish this is for the U.S. Army Corps of Engineers (the Corps) to initiate and continue habitat restoration programs that efficiently and effectively address the habitat needs of endangered and threatened species in the Missouri River ecosystem.

EnSp 1

Unfortunately, none of the proposals in the Revised Draft Environmental Impact Statement (RDEIS) would accomplish both of the necessary objectives. In fact, all five of the new alternatives presented in the RDEIS pose grave threats to the ability of the Corps to ensure that the Missouri River remains a "River of Many Uses." Despite many years of study and discussion, the latest round of proposals would potentially sacrifice entire industries, threaten the lives and livelihoods of downstream residents, and deprive downstream Missouri and Mississippi River states of needed water. All this is being proposed to achieve relatively small increases in habitat for the endangered species.

Other 6
EnSp 3

Contrary to some representations, Missouri does not oppose plans seeking to return some of the River's more "natural" features, especially those proposals that have scientifically-proven long-term environmental benefits to the riverine ecosystem. We do not believe, however, that the relatively miniscule habitat gains attributed to the alternatives in the RDEIS outweigh the substantial costs to other authorized river uses. For this reason, we believe the Corps has a duty to address our concerns about the current proposals by choosing a "Selected Plan" (a "Preferred Alternative") that includes many options and ideas not included in the RDEIS. Missouri has presented such plans and expressed our continued willingness to work with the Corps in this regard.

Other 137

Missouri has concerns that all new alternatives in the RDEIS would:

1) Result in long-term reductions in the amount of usable water released to downstream Missouri and Mississippi River states;
2) Impose artificial high flow releases in late spring that would have significant adverse effects on farmers;
3) Jeopardize the long-term viability of navigation on the Missouri River;
4) Negatively impact vital Mississippi River commerce by dramatically increasing the number of years low-water restrictions would be imposed; and
5) Fail to adequately address the endangered species concerns by providing insufficient habitat benefits, despite the massive disruption of other Congressionally-authorized river uses.

Missouri also reiterates our longstanding request that two crucial areas be examined more thoroughly before any final decisions are made. Namely, we request that the Corps honor its assurances to complete the following:

1) A detailed analysis of the impacts to the Mississippi River of all the Missouri River management alternatives proposed in the RDEIS.

Miss 4

2) A thorough analysis of the impact of reasonably anticipated future depletions on both the Missouri and Mississippi Rivers under each of the new alternatives under consideration.

Hydro 16
Miss 5

Please find a more detailed discussion of these concerns in the attachment to this letter as well as the accompanying letters from Missouri Executive Branch Departments.

In conclusion, the Missouri River is one of our nation's most valuable resources. Missouri shares a commitment with the rest of the citizens of the basin to restoring and protecting the Missouri River. As good stewards of this resource, we believe it is critical that we protect the river by making decisions regarding its future in a careful and deliberate manner.

Sincerely,

Bob Holden
Governor

BH:CW:se

Attachment

cc: President of the United States
The Honorable Gale Norton, Secretary of Interior
The Honorable Ann Veneman, Secretary of Agriculture
The Honorable Norman Mineta, Secretary of Transportation
The Honorable Mike Parker, Assistant Secretary for Civil Works, Dept of Army

Governor Holden Attachment 1

Concerns About Current Alternatives

Although these issues are addressed in greater detail in the attached testimony from Missouri executive branch departments, these extremely important points deserve brief elaboration.

First, Missouri sees significant dangers in proposals imbedded in all new alternatives contained in the RDEIS that would greatly increase total system storage in the upstream lakes. For example, the consistently higher reservoir levels contained in the so-called Modified Conservation Plan (MCP) alternative would increase the frequency of low-water restrictions on navigation on both the Missouri and Mississippi Rivers. Our analysis suggests that restrictions would have been implemented on both rivers during both 2000 and 2001, if MCP had been in place.

Hydro 29

Increased storage of water in the upper basin also reduces the flood control benefits of the upstream reservoirs. Limiting the flexibility of the Corps to manage the water in the lakes to ensure the greatest amount of flood protection places downstream states at even greater danger than they have been under the Current Water Control Plan (CWCP). I need not remind the Corps that even with the flood control benefits of the CWCP, Missouri has been ravaged by two massive floods during the last decade. In the wake of such natural disasters, reducing the Corps ability to prevent and moderate flooding seems downright foolish.

FC 13

Furthermore, we are extremely concerned that the assurance of increased storage in the upper basin reservoirs would increase the likelihood that upstream states would seek to deplete greater amounts of water from the Missouri River basin. Preliminary analysis has clearly shown that currently anticipated future depletions would cause extreme stress on the amount of usable water released to downstream states. Additional restrictions on the amount of water released from the upstream reservoir system would surely compound these problems.

Hydro 30

Second, Missouri's bottomland farmers would be placed at significant risk by proposals for a periodic spring rise, created by releases of additional water from Gavins Point Dam during May. We believe that the effects of such a spring rise on Missouri's agricultural community must be a top priority in this discussion. Our analysis shows that these proposals could increase the risk of flooding, result in higher groundwater levels, and cause inadequate drainage levels throughout the lower basin. The benefits attributed to the spring rise proposals are also questionable given that the entire length of the Missouri River within the State of Missouri already experiences a spring rise.

GW 2
IntD 1

The dangers of such a spring rise are increased because water from Gavins Point Dam takes approximately 10 days to reach St. Louis. Additional spring releases could potentially compound the effects of large rainfall events downstream of Gavins Point, thereby increasing the risk of unanticipated flooding in downstream states. It is absolutely essential that the agricultural community along the Missouri River remain viable and profitable in the twenty-first century.

FC 8

Third, Missouri is concerned that, despite assertions to the contrary, the flow levels and timing of the current proposals for a summer low flow differ significantly from the historic, pre-dam, natural hydrograph, thereby unnecessarily jeopardizing the long-term viability of navigation on the Missouri River. Missouri recognizes that a properly-timed and proportioned reduced late summer flow will likely benefit some sections of the river's ecosystem. However, the current proposals do not meet this description. The timing of the proposed low-flows is unnaturally early, occurring several weeks before the historic low period began. This proposed timing would thus not recreate any semblance of the "natural" Missouri River hydrograph, while unnecessarily creating increased difficulties for several other river users.

Missouri believes that a flow level exists that will benefit the endangered and threatened species and the environmental health of the river, while also ensuring that the long-term viability of river commerce is not degraded. Our state continues to advocate a reduced flow of 41,000 cfs at Kansas City from August 1 through September 15. The goal of this proposal, which would occur approximately three of every five years, is to balance the interests of the endangered species, recreation, while supporting full service navigation from Sioux City, Iowa, to St. Louis.

Hydro 31

The Missouri Department of Conservation has undertaken a GIS mapping project to examine this idea in greater detail. Their preliminary analysis shows the potential for some important habitat benefits, possibly without major disruptions to other river users. Unfortunately, due to time and financial constraints, this proposal has not been thoroughly examined. Missouri strongly encourages the Corps to use the vast resources at its disposal to finish the necessary study of this proposal.

Fourth, because of the importance of the Mississippi River as an economic engine, not only for Missouri but for the entire nation, we are concerned that any plan resulting in decreased releases of usable water to downstream states will disrupt navigation on the Mississippi. Increased storage in the upper basin, ill-timed reduced summer flows, and potential future depletions all pose threats to this vital economic artery.

Fifth, Missouri believes that the habitat benefits of any plan to alter the flows of the river must be weighed against the costs that must also be borne. When such comparison takes place, none of the proposed alternatives in the RDEIS pass the test. For instance, the Corps has determined that the low summer flows recommended by the U.S. Fish and Wildlife Service would create only about 100 acres of tern and plover habitat along the entire length of the river. However, in this analysis, the Corps did not take into account the tern and plover shoreline habitat that would be lost or degraded as a result of holding upstream reservoirs consistently higher. Had this been taken into account in the Corps analysis, the increase in tern and plover habitat would likely be significantly less that 100 acres.

Such cost-benefit analysis has been hampered by misleading presentations of critical data. For instance, the RDEIS combines the habitat benefits of the summer low-flow plans with the habitat benefits of unbalancing the upstream reservoirs, suggesting that the benefits of the low-flow plans offer greater benefits than they alone would actually provide. Missouri supports unbalancing of the reservoirs, but points out that the benefits of reservoir unbalancing should be analyzed separately from low flow proposals. To make an informed

choice about the benefits of the low-flow alternatives, they must be evaluated on their own merits and not combined with other unrelated proposals.

Furthermore, several promising options for improving the health of the river are not included in the RDEIS, making it difficult to compare the benefits of different types of approaches. For instance, the benefits of habitat improvement projects, which result in immediate and substantial habitat gains, are not compared with the relatively small habitat gains attributed to the low flow alternatives proposed in the RDEIS. Such projects have been shown to provide significant habitat benefits without imposing any restrictions on other river uses. Missouri urges the Corps to seek out and support these projects. The State of Missouri has strongly supported these joint Federal-State habitat improvement projects and will continue to advocate for dramatic increases in funding for these programs.

Inadequately Addressed Issues

Missouri is extremely concerned that two especially significant issues have not been adequately addressed despite several formal requests and repeated assurances that action would be taken.

First, after several promises that the impacts of all of the proposed alternatives on the Mississippi River would be thoroughly examined and shared with stakeholders, this has not occurred. We strongly encourage the Corps to complete this analyses and provide it to the affected stakeholders. To exemplify our concern, we again note that, had the Modified Conservation Plan (MCP) outlined in the RDEIS been in place during the past two years, the U.S. Coast Guard would have likely been forced to impose low water restrictions on the Mississippi River during both years. Such facts clearly demonstrate the potential for extremely negative consequences, not only on Missouri but on the entire Midwestern region of this nation.

Second, we are concerned that the Corps has not undertaken studies on the impact of reasonably anticipated future depletions on both the Missouri and Mississippi Rivers under each of the new alternatives under consideration. Last year, the governors of Arkansas, Illinois, Kentucky, Louisiana, Minnesota, Mississippi, Tennessee and Wisconsin joined me in sending a letter to President Bush requesting that such a depletion analysis be performed. And this past fall, Deputy Assistant Secretary Dominic Izzo responded to the request stating the depletion analysis would take place. Unfortunately, the Corps did not honor this promise.

Our analysis shows that depletions will affect the Corps' ability to ensure that the River remains "A River of Many Uses" if any of the new alternatives are chosen. Given the increased demand for water within the basin, the controversial nature of the Master Manual process, the fact that the current Water Control Plan has been in effect for four decades, and the likelihood that any new plan will remain in effect for at least the next 40-50 years, it is absolutely essential that the Corps thoroughly analyze depletions for the foreseeable future. Failure to do so would be a betrayal of the millions of people whose livelihoods depend on the continued availability of sufficient flows in both the Missouri and Mississippi Rivers.

Because of the extreme importance of these two issues, until they are studied and discussed, we do not believe that it is possible for the Corps to make a decision that will protect the citizens of this nation.

S0100006

STATE OF KANSAS

BILL GRAVES, *Governor*
State Capitol, 2nd Floor
Topeka, Kansas 66612-1590

(785) 296-3232
1-800-748-4408
FAX: (785) 296-7973

OFFICE OF THE GOVERNOR

February 28, 2002

Brigadier General David A. Fastabend
Northwest Division Commander
U S Army Corps of Engineers
P O Box 2870
Portland, Oregon 97208-2870

RE: Missouri River Master Manual Review

Dear General Fastabend:

This letter represents final comments on behalf of the State of Kansas regarding the Revised Draft Environmental Impact Statement (RDEIS) for the Missouri River Master Water Control Manual. These comments supplement preliminary comments provided in testimony from Chief Engineer David L. Pope at your hearing in St. Joseph, Missouri, on November 1, 2001.

Representatives of the State of Kansas have been active participants in the Master Manual review and update since its inception more than a decade ago, including participation through the Missouri River Basin Association (MRBA). MRBA has provided a valuable forum for discussion of these important issues among stakeholders and state and federal agencies throughout the basin. The State of Kansas supports the recommendations provided to you from MRBA by letter dated February 12, 2002. Please note the MRBA letter includes a recommendation that the Kansas River basin reservoirs should not be used for Missouri River navigation support without further study nor should there be additional restrictions on flood operations of these reservoirs.

This letter will also provide additional information regarding specific aspects of this matter of special concern to the State of Kansas and its citizens.

Impacts on the Kansas River System

Throughout this process, we have raised concerns about the impact of changes in the operation of the Missouri River reservoir system on the operation of the Kansas River tributary reservoirs, including Tuttle Creek, Milford and Perry. The Corps of Engineers has sometimes called on the Kansas River reservoir system to support Missouri River navigation when the Kansas City target flows are not being met. The State of Kansas has strongly opposed the use of the Kansas River reservoir system for this

Nav 21

purpose because of the tremendous negative impacts to economic benefits and the primary authorized purposes of these reservoirs while providing insignificant benefit to navigation on the Missouri River.

Nav 22

The RDEIS has provided insufficient information to evaluate the effect of the proposed changes in the Master Manual on the operation of the Kansas River reservoir system. The Kansas reservoirs could be potentially negatively impacted by: (1) increases in the amount of water stored in flood control space and (2) by additional drawdown from conservation storage for navigation support on the Missouri River. We do not believe additional water should be stored in the flood control space in the Kansas River reservoir system as a result of increased flows in the Missouri River associated with the trial spring rise. Likewise additional water should not be accumulated in the Kansas reservoirs, beyond that necessary for normal flood control operations, to provide water for navigation support later in the year. Additional storage in the flood control space of these reservoirs increases flood risk in Kansas and also hinders recreation use of the reservoir system. This exposes bare shoreline during key recreational times and is inconsistent with wildlife management practices. Further drawdowns to provide water for navigation support on the Missouri River from the conservation storage in these reservoirs also decreases the amount of water available for water supply and water quality purposes and hinders the recreational use. The State of Kansas has purchased conservation storage in these reservoirs for its water marketing and water assurance programs.

The Kansas River Water Assurance District was organized several years ago as a part of the water assurance program. The District represents 14 cities and industries that provide water to a large portion of the population of the State of Kansas and some important industrial facilities. The District reimburses the State of Kansas for its cost to repay its financial obligation for conservation storage in these reservoirs to the federal government. When operated as a system, the Kansas River reservoir system provides supplemental water supply to assure these entities have water during a major drought and provides sufficient streamflow to maintain a suitable quality of water and other instream flow benefits. Releasing water from these reservoirs to provide navigation support on the Missouri River directly conflicts with this system operation without providing significant benefits to the Missouri River.

I am pleased that the MRBA has joined the State of Kansas in opposing the use of the Kansas River basin reservoirs for Missouri River navigation support, at least until the impacts on the reservoirs has been studied and concerns resolved to the extent possible. For all of the reasons outlined above, the Corps of Engineers should eliminate its use of the Kansas River reservoir system to provide Missouri River navigation support.

Flow Management for Endangered Species and Environmental Restoration

The State of Kansas recognizes the Corps of Engineers is obligated to comply with the Endangered Species Act in order to preclude jeopardy of listed species. The recovery of the endangered species and restoration of the Missouri River will require significant habitat restoration on the Missouri River and its floodplain. We continue to support these efforts and also encourage the Corps to recognize that management of Missouri River fish and wildlife resources should be addressed as a system, so that populations of species not currently listed do not decline in the future. We also understand that some flow modification from the historic patterns may be necessary to avoid jeopardy of the listed species. While

EnSp 3

management process conducted according to the principles endorsed in the recent National Academy of Science study of the Missouri River. This includes the establishment of a multi-stakeholder group to oversee the implementation of the demonstration project. It is also critical the Corps operate the demonstration project in such a way as to minimize additional risk of flooding and drainage problems and to closely monitor and evaluate the results and impacts of these operations so that appropriate changes may be made in the future to maximize the benefit of these operations in the recovery of endangered species and to minimize the impacts to other project purposes and interests.

EnSp 12

Summary

In summary, the benefits of using the Kansas River reservoir system for navigation support on the Missouri River are not sufficient to offset the extensive negative impacts to the reservoir system in Kansas. The Corps has not determined the impacts of the various alternatives considered in the RDEIS on the Kansas River reservoir system. Accordingly, Missouri River navigation support from the Kansas River reservoir system should be discontinued. However, some change in operation of the Missouri River reservoir system will be necessary to respond to the contemporary needs of the basin and the restoration of the environmental resources sufficient to avoid jeopardy of endangered species. We believe that can be done without changing the operation of the Kansas River reservoirs.

Thank you very much.

Sincerely,

BILL GRAVES
Governor

pc: Senator Sam Brownback
Senator Pat Roberts
Representative Dennis Moore
Representative Jim Ryan
Representative Jerry Moran
Carla Stovall, Attorney General
Jamie Clover Adams, Secretary of Agriculture
Mike Hayden, Secretary of Wildlife and Parks
Clyde Graber, Secretary of Health and Environment
Al LeDoux, Director, Kansas Water Office
David L. Pope, Chief Engineer, DWR, KDA
MRBA Board of Directors and Executive Director
Mike Parker, Assistant Secretary of Army (CW)
Steve Williams, Secretary U S Fish and Wildlife Service
Ralph Morgenweck, U S Fish and Wildlife Service Regional Director, Denver, CO
William Hartwig, U S Fish and Wildlife Service Regional Director, Minneapolis, MN

S0100007

— State of —
North Dakota
Office of the Governor

John Hoeven
Governor

February 28, 2002

BG David A. Fastabend
Commander, Northwestern Division
US Army Corps of Engineers
P.O. Box 2870
Portland, OR 97208-2807

Dear General Fastabend:

Since the October public hearing in Bismarck, ND, further review of the Revised Draft Environmental Impact Statement for the Missouri River Master Water Control Manual (RDEIS) has allowed the undersigned State agencies to expand on the comments provided to you in Governor Hoeven's letter of October 23. The following comments along with the attached October letter from Governor Hoeven represent the official position of the State of North Dakota and reflect the collective input of the signatory agencies. Detailed technical comments from state agencies are also attached.

The drought of the late 1980's and early 1990's clearly illustrated that the current operating plan served navigation at the expense of almost all other project purposes. This emphasis on serving a navigation industry that had not developed as expected when the plan was written does not serve the contemporary needs of the basin. The inequities of the current Master Manual were further illustrated when the Courts directed the Corps to address the contemporary needs of society and consider revisions to the Master Manual. In addition, the fact that three species have been listed as threatened or endangered along the river would indicate that the current operations do not serve the authorized purpose of fish and wildlife satisfactorily.

Other 7

The drought conservation measures proposed by the Missouri River Basin Association (MRBA) included in the MCP and GP alternatives are essential to meeting the purpose of the Master Manual revision. While it is our opinion that these conservation measures do not adequately address the contemporary needs of the basin and do not achieve equitable distribution of benefits and hardship during droughts, we do recognize that other states in the basin disagree. In an effort to achieve an equitable distribution of benefits throughout the basin, 7 of the 8 MRBA member states have reached a compromise on these conservation measures. During this lengthy revision process the basin has suffered through the late 1980's and early 1990's drought and the extremely wet period from 1993 through 1999. Now, the basin is in the midst of another drought and it is critical that these conservation measures be implemented as soon as possible before the fisheries in the big lakes and the recreation industry is once again ravaged.

Hydro 14

600 E Boulevard Ave
Bismarck, ND 58505-0001
Phone: 701.328.2200
Fax: 701.328.2205
www.discovernd.com

We are especially concerned about Lake Sakakawea dropping below an elevation of 1825 feet msl during the summer. This elevation is critical during the summer months as when Lake Sakakawea drops below this level, the volume of cold water at the bottom is reduced and oxygen concentrations can fall below 5 mg/l, which violates State water quality standards. This situation puts the lake's sport fishery and the associated recreation industry in serious jeopardy. For North Dakota's interests, an operating plan that ensured Lake Sakakawea levels above 1825 even during a severe drought like the 1930's would be the best outcome of this revision. The advantage of the MRBA compromise is that it reduces the risk and frequency of lower lake levels without excessive impacts to other interests along the river.

WQ 14

We are disappointed that the RDEIS did not make it clear if the MCP alternative precludes jeopardy of the three listed species. From the information provided in the RDEIS as well as the Biological Opinion, it appears that the MCP will not preclude jeopardy. Therefore, North Dakota supports the MRBA recommendations provided to you in the letter of February 12, 2002, of a Gavins Point demonstration project roughly equivalent to the GP1528 alternative for approximately ten years. We also support the Fort Peck spring rise demonstration previously recommended by MRBA for a similar time period. Both of these demonstrations will require extensive monitoring. Because monitoring is critical to understanding the effects of the flow modifications from both dams, these demonstrations should not begin until sufficient monitoring is in place. It is critical to note that this monitoring is necessary only for the demonstrations mentioned. The conservation measures proposed should be implemented immediately and do not require monitoring.

EnSp 13,14

The results of the economic and environmental studies clearly illustrate that change in the operation of the Missouri River is essential to benefit the entire Missouri River Basin. The plan submitted by the MRBA is the best hope for equitable distribution of the benefits of the Missouri River and the equitable sharing of water shortages. We are confident that you will make the wise decision to implement these measures and that you will do so as currently scheduled so the river is operated in a manner that meets the contemporary needs of the basin beginning in 2003.

Sincerely,

John Hoeven
Governor

Dale L. Frink
State Engineer/Sec., State Water Comm.

Dr. Terry Dwelle
Department of Health

Doug Prchal
Parks and Recreation Department

Dean Hildebrand
Game and Fish Department

for Merl Paaverud
State Historical Society

cc: Larry Cieslik, PE, Chief Reservoir Control Center, Dept. of Army
Rose Hargrave, Missouri River Master Manual Project Director, Dept. of Army
Richard Opper, Executive Director, Missouri River Basin Association
N.D. Congressional Delegation

S0100008

— State of —
North Dakota
Office of the Governor

John Hoeven
Governor

October 23, 2001

Welcome to North Dakota.

On behalf of the State of North Dakota I offer the same clear and consistent message that we and adjoining states have been voicing for years. **The Master Manual must be changed and the time for that change is long overdue. In addition to my comments, state agencies will be submitting further comments in the coming months for you to consider.**

Time for change:

The five mainstem dams authorized by the Flood Control Act of 1944 were constructed in 18 years. If the Master Manual revision is completed in 2003, it will have taken 14 years. The people of North Dakota and the Missouri River Basin can wait no longer. To reinforce this point, on September 18, I joined five other governors, in a letter to the President urging him to see that changes in the Missouri River management are made and within a timely manner. In the past decade, we settled lawsuits that provided equal footing for upper basin needs, expecting the new Master Manual would be completed in a reasonable time. Fourteen years is long enough. Any further delay to the Master Manual is not acceptable.

Other 7

Some History:

Because the process has taken so long, some historical perspective is necessary. A major controversy arose in 1988 with the unnecessary and rapid drawdown of Lakes Sakakawea, Oahe, and Ft. Peck. The drawdown caused significant adverse impacts to many users of the Missouri River. Citizens suffered substantial losses of water for various uses, forcing businesses to be closed and causing untold economic damages. The upper basin states sued the Corps of Engineers to prevent similar treatment in future years. The Corps was directed by the Courts to address the contemporary needs of society and consider revisions to the Master Manual. In 1989, it initiated the first update of its Master Manual. In 1994, the Corps published a preferred alternative, which met with widespread criticism throughout the basin. As a result, the Corps initiated a new process to rewrite the Master Manual. Although I'm very disappointed that this process has taken so long, it is extremely important for everyone to understand that since 1994 significant agreement has been reached among the basin states.

Other 7

600 E Boulevard Ave
Bismarck, ND 58505-0001
Phone: 701.328.2200
Fax: 701.328.2205

After years of negotiations, seven of the eight states are ready for change. It is no longer upstream states fighting with downstream states. Kansas, Nebraska, and Iowa agree with the upper basin states that drought conservation measures are necessary. Believe it or not, even within the State of Missouri there are other individuals and even agencies that recognize the current water management plan for the Missouri River needs to be changed. This new process has taken seven more years and has cost millions of dollars, so we should now conclude this long journey by making the necessary changes.

Other 61

In addition to the states agreeing that change is warranted, there are other reasons for change:

Importance to North Dakota

- The Missouri River is of vital importance to the State of North Dakota for the various uses it provides. The power generated by the Missouri River dams, provides affordable electric rates for our citizens and to the citizens of neighboring states who receive much of the power from Garrison dam. Twenty percent of North Dakota citizens get their water from the river. Seven coal fired power plants use river water for cooling and six other industrial users including the Tesoro oil refinery and the Dakota Gasification plant make use of Missouri River water. Approximately 16 percent of the total irrigated area in North Dakota uses Missouri River water.

HPower 8

- The Missouri River, Lake Sakakawea, and Lake Oahe provide recreation opportunities to hundreds of thousands of residents and visitors to the state. In 1991, during the last drought, three state parks along Lake Sakakawea had 302,000 visitors, approximately 35 percent of the visitation to state parks. In 2000, visitation was 494,000, almost 49 percent of the visitation to state parks, representing $9 million and $14.8 million respectively in annual economic impact.

Rec 26

- The quality of the water in the Missouri River is important for municipal water supply and cold-water habitat. If the elevation of Lake Sakakawea falls below 1,825 feet during mid to late summer, the reduced oxygen concentration puts the nationally acclaimed sport fishery of the big lake in serious jeopardy. Low lake levels also increase risk to human health through the resuspension of sediment from the delta portion of the lake. Wave actions of low water disturb the sediment, releasing chemicals into the water that is subsequently used for municipal water supplies.

WQ 14

- The cultural and historical sites along the Missouri River are important to the State, the Standing Rock Sioux Tribe and the Three Affiliated Tribes, and further warrant change in the management of the river. Many of these cultural resources are destroyed on a daily basis through erosion, looting, and the absence of shoreline protection and stabilization. Stable lake levels would impact fewer sites, so a change in the operating plan that results in more stable lake levels in times of drought would benefit a resource that may otherwise be lost forever. These steps should be followed by the commitment of resources to stabilize the shoreline in order to protect and preserve these cultural and historical sites.

CR 11, 15

The draft EIS supports change by the benefits outlined in the five alternatives. They improve conditions for endangered species and conserve water in the mainstem reservoirs during times of drought. Unbalancing the reservoirs and increasing releases at Ft Peck may provide benefits for the pallid sturgeon, least tern and piping plover. Conserving water in the reservoirs during dry periods improves conditions for fish survival and thus recreation, and translates into more 'head' for hydropower. If these alternatives would have been in place during the drought of the late 1980s, Lake Sakakawea would have been 4 to 6 feet higher, translating into far better fish habitat, more efficient hydropower and an overall improvement in the economy of the areas that border the Missouri River.

EnSp 9
HPower 9
Rec 27

I want to turn to economic realities that further demonstrate the need for change. When the great dams were built, navigation was expected to move 20 millions tons of goods annually yet, that projection was unrealistic, with current levels of navigation being a paltry 1.5 million tons of goods annually. Recreation, however, has flourished on the Missouri River system. Navigation is less than 1/10th of the economic benefit of recreation. The recreation industry dwarfs navigation in national economic benefits of $84.7 million and $7.0 million respectively. Navigation can no longer dictate management of the entire river system, especially in view of the system-wide benefits that total $1.9 billion annually. Navigation provides jobs and transportation alternatives to people in Missouri, but we need to manage the river wisely and upon facts that provide the most benefit to the basin and to our country. In view of the economics, the justification for change is obvious.

Nav 18, 19, 9, 11

What we want--Agreement on drought control strategies:

The drought conservation measures included in the five new alternatives are essentially those agreed to by seven of the eight Missouri River Basin Association member states. Strictly from North Dakota's standpoint, they do not go far enough. But, they are likely the most equitable means of distributing hardship during drought and are supported by seven of the eight states within the basin, including North Dakota. These drought conservation measures proposed by MRBA should be implemented as soon as possible and will be a vast improvement over the 40-year-old Master Manual.

Hydro 14

The previous drought had terrible consequences for North Dakota businesses that were built upon recreation on the Missouri River. It has taken a decade for our people to recover from that disaster. Uncertainty caused by the Corps' management during drought has impeded capital investment, and development for new and existing businesses that would build upon the Missouri River's marvelous potential. If we are to sustain the recreation industry, we must incorporate conservation measures that stabilize reservoir levels during drought.

Rec 25

We know the hardships of drought cannot be entirely avoided. However, those hardships should not be aggravated by sacrificing the interests of all others to float a handful of barges in the lower Missouri. This is not wise management. It is not responsible management, and it is not fair management. The pain of drought must be shared equitably.

Nav 20

In conclusion, I urge the Corps to adhere to its current schedule for completing the Master Manual revision process. The time for equitable distribution of the benefits of Missouri River and equitable sharing of water shortages is now.

Other 147

There is no question that any of the five proposed alternatives is marked improvement over the current water control plan. The results of the economic and environmental studies clearly illustrate how the Missouri River and the reservoirs can be better managed to benefit us, our children and the entire Missouri River Basin. If we manage these resources intelligently, realization of their potential can benefit all. On behalf of the people of North Dakota, and the Missouri River Basin, I submit it is time for change on the Missouri River.

Sincerely,

John Hoeven
Governor

38:04:49

S0100009

STATE OF WYOMING
OFFICE OF THE GOVERNOR

JIM GERINGER
GOVERNOR

STATE CAPITOL
CHEYENNE, WY 82002

February 18, 2002

BG David A. Fastabend
Northwest Division Commander
US Army Corps of Engineers
P.O. Box 2870
Portland, OR 97208-2870

Dear General Fastabend:

Thank you for the opportunity to comment on the revised draft Environmental Impact Statement (rdEIS) on the Missouri River Master Water Control Manual. Although Wyoming is not a Missouri River mainstem state, approximately two thirds of the state does drain to the Missouri River basin, so we keep a watchful eye on downstream activities that could have an impact on our ability to manage Wyoming's water resources. The following comments will focus upon two main areas: Endangered Species Act compliance and Compact/Decree assurances.

Endangered Species Act Issues

As you are aware from attending the January 31, 2002 meeting of the Missouri River Basin Association (MRBA), that group has endorsed the concept of a 10-year demonstration period that would include flow provisions for both a spring rise and for lower summer flows. Resolution of endangered species listings is important to Wyoming. As a headwaters state, we have experienced the impacts of application of the ESA on water development in both the North Platte and Colorado River basins of our state. Adoption of a final alternative in the revised draft EIS process by the Corps of Engineers is essential to assure that a jeopardy opinion by the US Fish and Wildlife Service will not be forthcoming. Wyoming supports the demonstration period crafted by the MRBA as a good middle ground to balance the needs of the species through an adaptive management philosophy that will allow for monitoring the impacts of the flow changes while allowing other activities to be pursued as well. Implementing an adaptive management strategy, which includes full participation by the basin's stakeholders, will increase the success probability for recovery of the species, while at the same time

EnSp 16

E-MAIL: governor@state.wy.us
WEB PAGE: www.state.wy.us

TELEPHONE: (307) 777-7434
TDD:(307) 777-7860 FAX: (307) 632-3909

securing important buy-in from the entities most likely to be impacted by the flow changes. I support the addition of this flow demonstration to the other recommendations that were made by the MRBA in November, 1999.

EnSp 16

Interstate Compact and Court Decree Issues

Wyoming is party to seven separate interstate river basin compacts and to two US Supreme Court decrees, which serve to apportion the waters of the affected rivers between the states. The following table lists those compacts and decrees pertinent to the Missouri River Basin:

Other 145

River Basin	Year Implemented	States Involved
Yellowstone River Compact	1950	Wyoming, Montana, N. Dakota
Belle Fourche River Compact	1943	Wyoming, South Dakota
Upper Niobrara River Compact	1962	Wyoming, Nebraska
Laramie River Decree	1922	Wyoming, Colorado
North Platte Decree	1945 (modified 2001)	Wyoming, Nebraska, Colorado

The assurances provided for future water development by these compacts and decrees provide certainty for river planners. Several of the people providing testimony at your hearings on the rdEIS took a very hard line that they would oppose any future development by the upper basin states, which would certainly run contrary to the historical commitment by the United States for development planned in the upper basin by the Pick-Sloan Plan to offset the loss of prime farmland by the flooding of the large reservoirs. While the projected rate of new development in Wyoming is not expected to be large in the near future, we maintain that it is well within our rights to develop water as provided in the above compacts and decrees, without requiring the blessing of the further downstream Missouri River basin states.

I commend the Corps for voluntarily lengthening the public comment period beyond those required under the National Environmental Policy Act since the documents are voluminous and the issues complex. Now the time has come to bring this arduous planning task to conclusion and for you to make a decision that can begin implementation in 2003. Wyoming looks forward to working with you as we move from

the planning phase to the implementation phase of an updated Master Manual that more adequately reflects the contemporary needs of the Missouri River basin.

Best regards,

Jim Geringer
Governor

JG:dm

Cc: Senator Craig Thomas
Senator Mike Enzi
Rep. Barbara Cubin
MRBA Board of Directors
Hoke MacMillan, Attorney General
Patrick Tyrrell, State Engineer
Tom Davidson, Attorney General's Office
Ralph Morgenweck, FWS Regional Director

S0100010

OFFICE OF THE GOVERNOR

STATE OF MONTANA

JUDY MARTZ
GOVERNOR

STATE CAPITOL
PO BOX 200801
HELENA, MONTANA 59620-0801

March 13, 2002

Colonel David A. Fastabend
U.S. Army Corps of Engineers
Northwestern Division
220 N.W. 8th Avenue
Portland, OR 97208-2870

Dear Colonel Fastabend:

The State of Montana has reviewed the RDEIS and has submitted formal comments to the Corps prior to the close of the comment period in February. However, the purpose of this letter is not to specifically address the RDEIS, but rather to express our disappointment in the alternatives selected for consideration. Specifically, I wish to state our disappointment in the Corps' failure to recognize the important Montana issues in spite of our overwhelming willingness to "help" the Corps along in this process over the past several years.

Ever since the drought of the 1980's, the Corps has been aware that the main issue in Montana regarding the Master Manual is the level that Fort Peck reservoir was drawn down to. We have stated numerous times that the reservoir levels experienced during that period were not acceptable. For the past six years Montana has worked diligently within the Missouri River Basin Association to try to bring the highly contentious issue of flow management to a consensus position, (with the hope and expectation that this new position would include higher reservoir levels in times of drought for all the affected reservoirs). The Corp's Omaha contingent is intimately aware that Montanans hoped the Corps would have included alternatives that provided Fort Peck with higher reservoir levels during future years like the 1980's drought, as you did for Sakakawea and Oahe Reservoirs in the Dakotas.

You can imagine our disappointment when we examined all of the proposed alternatives and discovered that the Fort Peck reservoir level is no better off under any of the alternatives than we were under the current master control

Other 146

TELEPHONE: (406) 444-3111 FAX: (406) 444-4151

manual. It's as if all our involvement, leadership and compromise was for naught.

The irony is that over the past five years, Bud Clinch, my Director for the Department of Natural Resources and Conservation has worked very hard as a member and past president of the Missouri River Basin Association to achieve agreement among all the Missouri Basin states and Native American Tribes. Montana did everything possible to work toward this consensus – even supporting positions that we knew were not in our best interest just to keep the negotiations moving forward. For that we get ignored or even taken advantage of. While at least one state leveraged its position by enlisting its congressional members against you, we chose to play it straight with you, (which is kind of the Montana way). Unfortunately, we're questioning the wisdom of that strategy in light of what is before us.

Quite frankly, I'm most disappointed that after six years of intimate involvement between Montana and your staff that I find it necessary to write to you and at the eleventh hour facilitate meaningful engagement. Knowledgeable staff are well aware that Montana did not get a fair shake. If you and your staff would like to discuss Montana's concerns in a personal and forthright fashion, we would be eager to host you here in Helena. At a bare minimum I believe the Corps needs to address our basic concerns of maintaining a higher reservoir level at Fort Peck during drought and mitigating the impacts of the proposed Fort Peck spring rise before selecting your preferred alternative.

If a personal meeting is agreeable to you, it can be arranged through my scheduler, Lynn Staley by calling 406-444-5502.

Sincerely,

JUDY MARTZ
Governor

cc: Senator Conrad Burns
Senator Max Baucus
Congressman Denny Rehberg

S0200001

Christopher Rants
STATE REPRESENTATIVE
Third District
Statehouse: (515) 281-3054
–
Internet – www.voterants.org
e-mail - christopher@voterants.org
Fax: (515) 281-3807
–
HOME ADDRESS
2740 South Glass
Sioux City, Iowa 51106
Home: (712) 274-8874
Office: (712) 234-7089

House of Representatives
STATE OF IOWA
Seventy-Eighth General Assembly
STATEHOUSE
Des Moines, Iowa 50319

MAJORITY LEADER

February 19, 2002

U.S. Army Corps of Engineers, Northwest Division
Attention: Missouri River Master Manual RDEIS
12565 West Center Road
Omaha, NE 68144-3869

To Whom It May Concern:

As the State Representative for nearly 30,000 residents in the Missouri River Valley region and as Majority Leader of the Iowa House, I am very concerned about the proposed changes to the Master Manual for the operation of the Missouri River.

My fellow citizens and I from the Sioux City area would like to express our opposition to changing the Master Manual—the current flow pattern for the operation of the river should be maintained. The Missouri system was designed to protect the basin from flooding during the high summer flow periods and enable the system to withstand a drought similar to that of the 1930's. Thus far, The Corps has been successful in achieving these goals. The Missouri River has not flooded in Sioux City since the early 1950's and drought management has been effective.

FC 4 & 12

Studies exploring the effects of changing the water flow at Gavin's Point Dam are inconclusive and do not support the recommendations made by The Corps in its Revised Draft Environmental Impact Statement (RDEIS). The goal of elevating populations of nearly distinct Missouri River species could be met through various other conservation and restoration measures that would not threaten the Missouri River Valley way of life. If the RDEIS is incorporated, Siouxland will experience a harsh economic, environmental and recreational downturn.

EnSp 17,18

Rec 4,5,6

The Corps needs to make the right decision today. The entire basin has built a socio-economic system around the current river structure and operating plan. Major changes to the system and plan will disrupt that which nature has been carefully building for over 50 years. Based on the threats these changes pose to the residents, stakeholders and environment of the Missouri River Valley region, the current flow pattern for the operation of the river should be maintained.

Sincerely,

The Honorable Christopher Rants
Iowa House Majority Leader

S0200002

CHUCK GROSS
23RD DISTRICT
STATE CAPITOL, ROOM 434
JEFFERSON CITY, MISSOURI 65101
PHONE 573-751-8635
FAX 573-751-2745
TDD 573-751-3969

415 NORTH SECOND STREET
ST. CHARLES, MISSOURI 63301
PHONE 636-949-2323
FAX 636-947-7787

MISSOURI SENATE
JEFFERSON CITY

COMMITTEES:
PENSIONS & GENERAL LAWS, CHAIRMAN
STATE BUDGET CONTROL, VICE-CHAIRMAN
APPROPRIATIONS
CIVIL & CRIMINAL JURISPRUDENCE
COMMERCE & ENVIRONMENT
FINANCIAL & GOVERNMENTAL
ORGANIZATION, VETERANS' AFFAIRS
& ELECTIONS

January 23, 2002

Via Facsimile 402-697-2504
and Regular Mail

U.S. Army Corps of Engineers
Northwestern Division
Attn: Missouri River Master Manual RDEIS
12565 West Center Road
Omaha, NE 68144

RE: Missouri River Master Water Control Manual

Ladies and/or Gentlemen:

Please accept these comments regarding the Revised Draft Environmental Impact Statement for the Missouri River Master Water Control Manual. As a Missouri state senator representing St. Charles County, with the Missouri River comprising the county's entire southeastern boundary from the confluence of the Missouri and Mississippi Rivers, my constituents and I have profound concerns with any of the contemplated actions to change the current flow of the Missouri River. These concerns include greater flooding, reduced drinking water supplies, loss of electrical energy production and navigation, and a threat to our water quality and national security. I am adamantly opposed to any plan that would include a spring rise, a split navigation season, or any further water depletions.

It is my understanding that the recent National Academy of Sciences' report on the Missouri River acknowledges that it is impossible to know that these proposed changes in flow would actually benefit wildlife and river restoration. We do know that current projects have already begun to reverse the loss of habitats along the Missouri River without changes to the Current Water Control Plan. I would concur with the Missouri Department of Natural Resources that changes in flow to accommodate three species may well in turn be a threat to yet other species. Habitat restoration can and is occurring under the Current Water Control Plan.

EnSp 4, 7, 1

We also know that navigation will be significantly impaired on the Missouri River if flows are decreased and a split navigation season implemented, resulting in a loss of jobs, increased transportation costs, and reduced air-quality due to increased rail and truck transport. Such restrictions upon navigation would also jeopardize our national security and military

Nav 12, 23, 24

U.S. Army Corps of Engineers
Attn: Missouri River Master Manual RDEIS
January 23, 2002
Page Two

preparedness, the importance of which has been made all too clear in the last few months. These disastrous effects will resonate not only along the Missouri River and throughout the Midwest, but also along the Lower Mississippi River and the entire nation.

St. Charles County, at least 43 percent of which is in floodplain, is home to some of the most productive farm land in America. My farming constituents already struggle with nature's floods. I cannot justify jeopardizing their livelihoods and our nation's food production and agricultural economy for any of the unproven benefits suggested in the flow alternatives. We must not increase flooding by compromising the Current Water Control Plan.

FC 6

Many of Missouri's citizens depend upon the Missouri River for their electricity and their drinking water, and reducing flows will jeopardize both of these essential resources. Ameren UE has reported that lowered flows in the summer, when flows are already down naturally, will impede its ability to provide reliable electric service to the eastern portion of Missouri, including the St. Louis region of which St. Charles County is a part. Additionally, these reduced flows will impair the quality of water in this same region, jeopardizing the health of our residents.

MoPower 1
WQ 2

I am unconvinced that there are any proven benefits to be reaped through the proposed changes in the Missouri River's Current Water Control Plan that would justify the very real problems these changes would mean to my constituents and the citizens of this entire region. With the added risks to our nation's economy and our very security, it would be unconscionable to proceed in this direction. On behalf of my constituents in Missouri's 23rd state senatorial district, I would implore the U.S. Army Corps of Engineers to maintain the Current Water Control Plan for the Missouri River.

Sincerely,

Chuck Gross
Missouri State Senator, 23rd District

CG/vh

ATTORNEY GENERAL OF MISSOURI

JEFFERSON CITY
65102

JEREMIAH W. (JAY) NIXON
ATTORNEY GENERAL

P.O. Box 899
(573) 751-3321

February 28, 2002

Brigadier General David A. Fastabend
Commander, Northwestern Division
U.S. Army Corps of Engineers
P.O. Box 2870
Portland, OR 97208-2870

Dear General Fastabend:

As Missouri Attorney General, I have fought to protect the Missouri River as a viable water supply for future generations. I also have fought to protect recreational, commercial and agricultural uses on and along the river.

Legal

I oppose the current alternative water control plans proposed by the U.S. Army Corps of Engineers. These alternatives provide less support for flood control and downstream uses of the river. Accordingly, while we support habitat restoration efforts based on "smart engineering" concepts rather than Gavins Point release modifications, we oppose the present alternatives to the current water control plan.

Decades ago, the American people entrusted the U.S. Army Corps of Engineers with the responsibility to develop and manage the Missouri River system. In the Flood Control Act of 1944, Congress mandated that the works of improvement be built and operated to serve two predominant purposes: flood control and navigation. The alternatives to the current water control plan under consideration serve neither purpose. In fact, if implemented, these alternatives would greatly reduce the system's ability to achieve the Congressionally-established purposes. Consequently, the Corps lacks legal authority to implement them.

None of the alternatives to the current water control plan under consideration can achieve the Nation's critical objectives for managing this complex system. It is my understanding that the common thread that links these alternatives is certain "water conservation measures" that result in increased reservoir levels and more frequent reduced flows to downstream states including Missouri.

www.ago.state.mo.us

It is apparent to me that these potential changes are motivated by an upstream desire to control the waters of the Missouri River rather than a interest in protecting endangered species. The detailed analyses submitted by the Missouri Department of Natural Resources reveal the insincerity of the environmental motivation.

In addition, it should now be apparent that the "natural hydrograph" depicted in the Gavins Point alternatives is not natural to the Missouri River. The expert analyses by the MDNR have laid bare the fallacy of the "low summer flow."

In fact, the lowest summer flow demanded by the U.S. Fish and Wildlife Service actually coincides with the peak flow period under the real natural flow regime, and this fact is beyond dispute.

It is my understanding that the flows prescribed by the Service will deliver insignificant benefits to endangered species–less than 100 acres of new habitat in Nebraska for terns and plovers. It is wrong to risk sacrificing downstream benefits for such a paltry gain. Surely smart engineering of river training structures can yield more than 100 acres of habitat.

Mitigation is the key to protecting native species. The Corps' success on the Mississippi River proves that simply re-engineering certain structures can positively change flow, depth and other habitat variables, without adjusting upstream releases. I have always supported mitigation where it is welcome in the community.

In light of the National Academy's recent interim report on endangered and threatened fishes in the Klamath River basin, we should not rush to judgment on the Missouri River. The Klamath River report concluded that there is "no scientific justification" for increased flows to protect the endangered coho salmon. "While the provision of additional flow seems intuitively to be a prudent measure for expanding habitat, the total habitat expansion that is possible given the limited amount of water that is available in dry years is not demonstrably of much importance to the maintenance of the population."[1] Rather than relying on a biologist's intuition, as the Corps must do if it accepts the Service's prescriptive demands, the Corps should rely on scientific justification. As the MDNR analyses show, intuition is not reliable since the bed of the Missouri River has lowered over time. Because the bed is lower, the benefits one intuits from certain flows will not be realized given the present channel configuration. Instead of sandbar islands and shallow shoals, experts predict the result likely will be more deep water habitat that does not benefit the pallid sturgeon, the tern or the plover.

[1]Interim Report from the Committee on Endangered and Threatened Fishes in the Klamath River Basin, p. 18.

MASTERMANUAL NWD02 S0200003

From: Bill Bryan [Bill.Bryan@mail.ago.state.mo.us]
Sent: Thursday, February 28, 2002 3:52 PM
To: Mastermanual
Cc: Joe Bindbeutel; Tad Kardis; nrbacor@mail.dnr.state.mo.us; nrdrewj@mail.dnr.state.mo.us; nrkucer@mail.dnr.state.mo.us; nrwellm@mail.dnr.state.mo.us
Subject: Comments on RDEIS (hard copy to follow by U.S. Mail)

COMMENT 2002.pdf

To Whom it May Concern:

The Missouri Attorney General's Office has prepared and submitted official comments by U.S. Mail. An electronic copy of our comments is attached for your use. Review of this electronic copy and the hard-copy will result in duplication of effort. The hard-copy should be reviewed in preference to this electronic version which is submitted to ensure timely filing and for your use in preparing a "response to comments." Please note that Attorney General Nixon's cover letter is not included with this electronic transmission.

Please make our comments a part of the official record. Thank you and please let me know if you have any questions.

Bill Bryan
Deputy Chief Counsel
Missouri Attorney General's Office
P.O.Box 899
Jefferson City, MO 65102

573.751.8796 (fax)
573.751.8815
bill.bryan@mail.ago.state.mo.us

ATTORNEY GENERAL OF MISSOURI

JEFFERSON CITY
65102

JEREMIAH W. (JAY) NIXON
ATTORNEY GENERAL

P. O. Box 899
(573) 751-3321

February 28, 2002

Brigadier General David A. Fastabend
Commander, Northwestern Division
U.S. Army Corps of Engineers
P.O. Box 2870
Portland, OR 97208-2870

Dear General Fastabend:

As Missouri Attorney General, I have fought to protect the Missouri River as a viable water supply for future generations. I also have fought to protect recreational, commercial and agricultural uses on and along the river.

I oppose the current alternative water control plans proposed by the U.S. Army Corps of Engineers. These alternatives provide less support for flood control and downstream uses of the river. Accordingly, while we support habitat restoration efforts based on "smart engineering" concepts rather than Gavins Point release modifications, we oppose the present alternatives to the current water control plan.

Decades ago, the American people entrusted the U.S. Army Corps of Engineers with the responsibility to develop and manage the Missouri River system. In the Flood Control Act of 1944, Congress mandated that the works of improvement be built and operated to serve two predominant purposes: flood control and navigation. The alternatives to the current water control plan under consideration serve neither purpose. In fact, if implemented, these alternatives would greatly reduce the system's ability to achieve the Congressionally-established purposes. Consequently, the Corps lacks legal authority to implement them.

Legal 21

None of the alternatives to the current water control plan under consideration can achieve the Nation's critical objectives for managing this complex system. It is my understanding that the common thread that links these alternatives is certain "water conservation measures" that result in increased reservoir levels and more frequent reduced flows to downstream states including Missouri.

Other 23, 198

It is apparent to me that these potential changes are motivated by an upstream desire to control the waters of the Missouri River rather than a interest in protecting endangered species. The detailed analyses submitted by the Missouri Department of Natural Resources reveal the insincerity of the environmental motivation.

In addition, it should now be apparent that the "natural hydrograph" depicted in the Gavins Point alternatives is not natural to the Missouri River. The expert analyses by the MDNR have laid bare the fallacy of the "low summer flow."

Hydro 46

In fact, the lowest summer flow demanded by the U.S. Fish and Wildlife Service actually coincides with the peak flow period under the real natural flow regime, and this fact is beyond dispute.

It is my understanding that the flows prescribed by the Service will deliver insignificant benefits to endangered species–less than 100 acres of new habitat in Nebraska for terns and plovers. It is wrong to risk sacrificing downstream benefits for such a paltry gain. Surely smart engineering of river training structures can yield more than 100 acres of habitat.

EnSp 46

Mitigation is the key to protecting native species. The Corps' success on the Mississippi River proves that simply re-engineering certain structures can positively change flow, depth and other habitat variables, without adjusting upstream releases. I have always supported mitigation where it is welcome in the community.

Other 70, 218

In light of the National Academy's recent interim report on endangered and threatened fishes in the Klamath River basin, we should not rush to judgment on the Missouri River. The Klamath River report concluded that there is "no scientific justification" for increased flows to protect the endangered coho salmon. "While the provision of additional flow seems intuitively to be a prudent measure for expanding habitat, the total habitat expansion that is possible given the limited amount of water that is available in dry years is not demonstrably of much importance to the maintenance of the population."[1] Rather than relying on a biologist's intuition, as the Corps must do if it accepts the Service's prescriptive demands, the Corps should rely on scientific justification. As the MDNR analyses show, intuition is not reliable since the bed of the Missouri River has lowered over time. Because the bed is lower, the benefits one intuits from certain flows will not be realized given the present channel configuration. Instead of sandbar islands and shallow shoals, experts predict the result likely will be more deep water habitat that does not benefit the pallid sturgeon, the tern or the plover.

Other 14, 189

EnSp 59

[1]Interim Report from the Committee on Endangered and Threatened Fishes in the Klamath River Basin, p. 18.

We have prepared the enclosed legal memorandum to assist you in making the difficult decision ahead. We have comprehensively briefed the pertinent federal statutes and offered our perspective on the RDEIS alternatives to the current water control plan. Please let me know if you have any questions.

Sincerely,

JEREMIAH W. (JAY) NIXON
Attorney General

wjb:JWN
c: Honorable Bob Holden

MEMORANDUM

TO: Brigadier General David A. Fastabend

FROM: Joseph P. Bindbeutel, Chief Counsel, Environmental Protection Division
William J. Bryan, Deputy Chief Counsel
Theodore A. Kardis, Assistant Attorney General

DATE: February 28, 2002

RE: **Master Manual Revised Draft Environmental Impact Statement**

We have carefully reviewed the critical components of the Revised Draft Environmental Impact Statement (RDEIS) and intensively researched the legal issues presented by the RDEIS. We support "smart engineering to develop the habitat necessary for the pallid sturgeon, interior least tern, and piping plover. We do not support Gavins Point Flow changes or reservoir level increases as contained in the alternatives to the Current Water Control Plan (CWCP). The supposed habitat benefits (as little as 69 acres for the shorebirds) are not worth the risks and harm to Missourians.

Executive Summary of Comments

The RDEIS is legally inadequate for many reasons. First, the discussion of alternatives fails to sufficiently consider reasonably foreseeable future impacts including depletions and out-of-basin transfers of Missouri River water. Second, "adaptive management is contrary to NEPA's "hard look and public participation requirements. Third, the public comment period was not meaningful because it opened before the RDEIS was available to the public, and closed while several important studies were still underway and thus were not made available for public comment at all. Fourth, increased pool levels caused by all five of the alternatives to the current water control plan would inundate critical habitat for the interior least tern and piping plover around the reservoirs and thus constitute an unlawful taking of an endangered species by habitat modification for which there is no

incidental take permit available under the BiOp in violation of 16 U.S.C. 1538(a)(1)(B). Fifth, increased spring releases threaten to condemn prime farmland along the Missouri River and its tributaries due to flooding, increased risk of flooding, impeded interior drainage, and practical restrictions on the actual use of farmland all without just compensation in violation of the Fifth Amendment. Sixth, the RDEIS reflects inadequate consideration of Mississippi River impacts (an important study is still ongoing, as explained above). Seventh, the RDEIS fails to account for power supply impacts on the lower river related to more frequent water shortages stemming from the "low summer flow feature. Finally, the alternatives under consideration would jeopardize congressionally-authorized project purposes, flood control and navigation, and accordingly, those alternatives are *ultra vires*. These comments and others are expressed in greater detail in the following pages.

National Environmental Policy Act (NEPA)

Congress enacted NEPA in 1969 and President Nixon signed it into law on January 1, 1970. NEPA establishes a policy goal for the nation. NEPA does not require a federal agency to make a particular decision in any case, it only requires a federal agency to consider the ramifications of certain actions. This has been interpreted by the courts as the "hard look" requirement. See, e.g., Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 350, 109 S.Ct. 1835, 1846, 104 L.Ed.2d 351 (1989). A federal agency must take a hard look at the environmental impacts of all "major federal actions significantly affecting the quality of the human environment." See 42 U.S.C. § 4332. The policy goal of the nation, then, is not necessarily for every federal agency to make every decision "green," although we are not implying that would be a good or a bad policy *per se*. Instead, the policy goal is simply for federal agencies to consider the potential environmental consequences before acting.

Congress described the purpose of NEPA with these words:

> To declare a national policy which will *encourage* productive and enjoyable harmony between man and his environment; to *promote*

> efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; *to enrich* the understanding of the ecological systems and natural resources important to the Nation and to establish a Council on Environmental Quality.

42 U.S.C. § 4321 (emphasis added). Congress did not intend for NEPA to be a panacea for all environmental maladies. Instead, Congress simply wanted to encourage and promote environmental awareness, particularly in the deliberative processes of federal agencies.

NEPA provides a check to ensure that federal agencies follow the policy goal of the nation to take environmental considerations into account. The "detailed statement" requirement is designed to ensure some accountability. See 42 U.S.C. § 4332(2)(c). For every "major federal action significantly affecting the quality of the human environment" the responsible federal agency must prepare a detailed statement, commonly referred to as an environmental impact statement, which shows that the agency fully considered the potential environmental consequences of a particular proposed action in the decision-making process.

The detailed statement requirement is procedural and "action-forcing". See Robertson, 490 U.S. at 350, 109 S.Ct. at 1846. It is designed to encourage public input and ensure the accountability of the agency about to make an important decision. See id., 490 U.S. at 349, 109 S.Ct. at 1845. Basically, the detailed statement must explain how the alternatives in it and decisions based on it will or will not achieve the policy goal of NEPA. 40 CFR 1502.2(d). The detailed statement must be made available for public comment. 40 CFR 1506.6. This is usually done with the publication of a DEIS, or in this case, a Revised DEIS (RDEIS), with the "R reflecting the revision of the Corps' 1994 DEIS, which never reached the stage of a final EIS.

Other 315

The opportunity for public comment must allow the time for reflection and study which is necessary for interested parties to make meaningful comments. See, e.g., State ex rel Siegelman v. Environmental Protection Agency, 911 F.2d 499, 504 (11th Cir. 1990) (opportunity to comment pursuant to NEPA means a meaningful opportunity to comment). The federal agency must evaluate

the comments at the close of the comment period, and not before. See 40 CFR 1503.4. If the agency makes substantial changes in the proposed action or significant new circumstances or information is brought to the attention of the agency, then the agency must prepare a Supplemental DEIS before it publishes an environmental impact statement (EIS). Otherwise, the agency must cause a final EIS to be prepared taking into account the comments received in response to the DEIS. 40 CFR 1503.4(b). The process repeats itself with respect to the EIS and then, and only then, can the federal agency render a final decision regarding the proposed action. The agency must prepare a Record of Decision (ROD). 40 CFR 1505.2. The ROD is subject to judicial review as a final agency action under the Administrative Procedure Act (APA), 5 U.S.C. § 702.

Other 3, 26

Substantive NEPA Comments

1. Out-of-basin transfer impacts: The impact of flow management changes as proposed by the RDEIS would be compounded by future depletions of Missouri River water. Several planned out-of-basin transfers would take Missouri River water completely outside of the basin, never to meet any project purposes or provide any benefits to the basin. Yet, the RDEIS fails to adequately contemplate or analyze the scope and breadth of these depletions, which are much closer to becoming a reality than many realize. For instance, there has been no analysis of depletions whatsoever with respect to the Modified Conservation Plan (MCP) alternative.

Other 9, 172

For years, upstream interests have pursued a plan known as the Garrison Diversion, which has been labeled the granddaddy of wasteful water projects by national environmental and tax-relief groups. The passage of federal legislation, the Dakota Water Resources Act of 2000, has brought the Garrison Diversion to the brink of realization by making the Northwest Area Water Supply Project possible. This is by no means the only out-of-basin transfer contemplated by the larger Garrison project. The United States Congress continues to fund this boondoggle. On October 30, 2001, a House-Senate conference committee approved more than $70 million dollars in funding for North Dakota water projects, including $27.5 million for the Garrison Diversion. But even if federal

funding should fail, the State of North Dakota has set aside about $382 million dollars from its tobacco settlement proceeds to fund water development projects. *See* N.D. CENT. CODE, § 54-27-25 (2001).

Under the National Environmental Policy Act, the Corps must consider reasonably foreseeable future developments. Garrison and its progeny are such developments, yet the RDEIS virtually ignores the impacts of these depletions. The Corps should conduct a more thorough depletion analysis in order to comply with NEPA.

2. Adaptive Management: Recognizing its NEPA responsibility to prepare an EIS regarding major federal actions significantly affecting the quality of the human environment, the Corps published its RDEIS for potential revisions to the Master Manual. Indeed, a change in the management of the Missouri River is a major federal action. However, the RDEIS proposes a deviation from the Congressionally-mandated NEPA process.

Legal 22
Other 3, 10

All the Master Manual alternatives in the RDEIS include a concept called Adaptive Management. This feature of the RDEIS could foreclose future meaningful public comment on Missouri River management. In fact, Corps publications regarding the RDEIS leave the distinct impression that the Corps believes it is employing Adaptive Management already. *See* RDEIS Summary at 4-5.

One can try to define Adaptive Management, but it is difficult. It is impossible, however, to define with any certainty what will result from Adaptive Management. With Adaptive Management, the Corps will be able to "test hypotheses and "explore changes in the operation of the Missouri River system. Indeed, its language is the language of uncertainty with jargon like: "flexibility, "adapt, "operational changes, "on avera ge, and "as conditions allow. In one word, vague. The Corps envisions future management of the river under this new scheme by working with the USFWS through the Agency Coordination Team. Perhaps the Corps will render these decisions subject to public participation, peer review, and judicial review. However, if decisions are made

which constitute a "major federal action, the Corps will violate NEPA if it attempts to use Adaptive Management as an excuse for circumventing the NEPA process. The Corps must also consider that it is an agency, and when it makes a "final decision, that decision is subject to review under § 5 of the APA. 5 U.S.C. § 702.

The RDEIS forecasts a murky future after a new Master Manual is in place. We are concerned that the 2002 Master Manual may be the last Master Manual in the eyes of the Corps. In the future, if the Corps can simply make operational changes as "new information becomes available, it may not want to engage the public in this process again. The Corps appears to suggest that Adaptive Management might be applied to the problem of ecosystem restoration, funneling public involvement through a stakeholder group. RDEIS § 6.5.7. The establishment of a stakeholder group raises a host of questions. While delegation of decision-making power to a stakeholder group may be appealing to some, it would likely constitute an unlawful delegation of agency authority. A stakeholder group may be subject to the application of the Federal Advisory Committee Act. Will consensus be supported by science? What is the measure of success? These are questions the RDEIS fails to either ask or answer. While the Corps may prefer the incrementalism of Adaptive Management to the NEPA/APA process, incrementalism and NEPA/APA are at odds. NEPA and the APA offer certainty, openness, fairness, accountability and predictability.

Other 3, 10

3. Public Comment: The Corps did not provide the public with a meaningful opportunity to comment. Although the Corps ostensibly established a comment period of 6 months, the Corps has not provided the public with sufficient time to study this matter and make meaningful comments. While we received a copy of the 29 page Summary of the RDEIS ("RDEIS Summary) soon after its August 2001, publication date, we did not obtain a complete copy of the RDEIS until the day of the first Public Workshop/Public Hearing in Missouri, which took place on November 1, 2001, in St. Joseph. Even then, the two volume RDEIS we procured was the only copy the Corps had on hand that day. While the Summary touts a 6-month public comment period following

Other 26

publication of the RDEIS, running from August 2001, to the end of February, 2002, as a practical matter the comment period has been much shorter due to the unavailability of the RDEIS document. The nation's policy goal to ensure informed decision-making cannot be achieved with such a brief comment period in the face of such complex and far-reaching issues. Considering the complexity of the issues, coupled with the fact that the Corps published the RDEIS much later than it promised, the opportunity for comment which the Corps provided is inadequate to achieve the goals of NEPA. The comment period should remain open at least another ninety (90) days. This would not be an unusual time frame for a project of this magnitude. After all, the Corps took years to assemble the data. Requiring the public to digest and intelligently comment on the RDEIS in a few short months does nothing to accomplish the goals of NEPA.

Contrary to popular opinion, there is no deadline for concluding this review.[1] The Corps has allowed an arbitrary date set by the U.S. Fish & Wildlife Service (USFWS) to rush this process to a conclusion. The origin of this date is the USFWS' November 2000, Biological Opinion (BiOp) on the Corps' current operation of the river. The BiOp sets March 2003, as the date by which a revised Master Manual must be implemented to preclude jeopardy of three species, the interior least tern, the piping plover, and the pallid sturgeon. The Corps believes it must comply with the BiOp by meeting this "deadline. *See* RDEIS Summary at 5. The legislation which gives rise to the BiOp is the Endangered Species Act (ESA), yet nothing in the ESA requires the Corps to respond to a BiOp within a certain period of time. However, the effect of the USFWS' arbitrary deadline is to force the Corps to rush the process to comply with several intermediate deadlines under NEPA so that it can make the March 2003 deadline set by the USFWS. The Corps has borrowed time from the public simply to meet this arbitrary deadline.

Other 204

[1]Various stakeholders have been informed by federal officials that a "court-imposed deadline requires the Corps to act. We have attempted to asc ertain the existence of such a court order, and have determined that none exists.

One example of the way in which the rush to respond to the BiOp has harmed the public's ability to participate are the several studies the Corps is presently undertaking in response to stakeholder requests for information. These studies, which should provide insight into impacts on tern and plover habitat, navigation on the Missouri and Mississippi rivers, dredging costs, conflicts with a Biological Opinion regarding the Mississippi River, and power at risk, will not be completed until after the RDEIS comment period has closed. This information should be made available to allow the public a meaningful opportunity to comment before a decision is reached by the Corps.

Other 316

4. "Take under the Endangered Species Act: The ESA makes it unlawful for any person to "take an individual member of an endangered species. 16 U.S.C. 1538(a)(1)(B). "Take has been broadly interpreted by the Service and the courts to include actions that result in modification of habitat for an endangered species. See, e.g., Sierra Club v. Yeutter, 926 F.2d 429 (5th Cir. 1991) (even-aged forest management modified habitat and resulted in a "take of red cockaded woodpecker); Palila v. Hawaii Dep't of Land and Natural Resources, 649 F.Supp. 1070 (D. Hawaii 1985)(introduction of exotic species, mouflon sheep, resulted in habitat modification and a "take of endangered palila). In this instance, the Corps is faced with both habitat modification threats under the alternatives to the CWCP, and the reasonable and prudent alternative suggested by the Service provides no relief since these threats were not addressed in the BiOp.

Legal 23

Construction of the reservoirs, obviously, resulted in modifications to habitat relied on by the pallid sturgeon, interior least tern, and the piping plover. The walleye, like the mouflon sheep that resulted in a modification of the endangered palila's habitat, is not a species native to the Missouri River ecosystem. Management changes that are intended to benefit exotic species rather than native ones must be given strict scrutiny under the ESA's "take provision.

Certain reservoir management strategies evident in the alternatives are intended, at least in part, to benefit the upstream reservoir walleye fisheries. Whether these changes may result in a "take in violation of the ESA by modifying the habitat of the pallid sturgeon, interior least tern or

piping plover should be evaluated in further section 7 consultations. For example, the alternatives under consideration all include higher reservoir levels and thereby would inundate habitat for the interior least tern and critical habitat for the piping plover adjacent to the reservoirs.[2] This habitat loss, no matter how modest, no matter what the duration, constitutes a "take in violation of the ESA irrespective of any incidental take below Gavins Point. Accordingly, these alternatives should be subject to further section 7 consultation and must be given equally strict scrutiny.

5. Farmland takings: The Corps did not consider the substantial devaluation of prime farmland adjacent to the Missouri River that will result from the ill-conceived "spring rise." When the federal government raises a navigable stream like the Missouri River and maintains it continuously at that level, the Government is liable "for the effects of that change (in the water level) upon private property beyond the bed of the stream." See United States v. Kansas City Life Insurance Co., 339 U.S. 799, 800-801 (1950)(change in river level caused by lock and dam is an unconstitutional taking of flooded Missouri farm, including damages caused solely by impeded interior drainage); United States v. Dickinson, 331 U.S. 745, 749-751 (1947)(raise in river level is an unconstitutional taking of the flooded land and the land which washes away as a result); and United States v. Cress, 243 U.S. 316 (1917)(an improvement on a navigable stream causing flooding on a non-navigable tributary is an unconstitutional taking of land along tributary). These concerns should have been addressed in the RDEIS.

Legal 24

6. Mississippi River impacts: The impacts of flow management changes on the Missouri River are important to Mississippi River states because the Missouri River provides as much as 60% of the Mississippi River's flow at times. A reduction in this flow support to Mississippi River

[2]While the Service has taken steps to designate critical habitat surrounding the reservoirs for the piping plover, including substantial acreage far in excess of the paltry 69 acres attributed to the potential Gavins Point flow modification alternatives, it has not taken steps to designate critical habitat for the interior least tern or pallid sturgeon. Presumably, what is critical habitat for the piping plover is likely critical habitat for the tern as well.

navigation could be enormously costly. Case in point: the reach between St. Louis and Cairo, Illinois, is a transportation bottleneck, particularly during low flows.

How do flow management changes impact the bottleneck? The RDEIS fails to answer this question for several of the alternatives. However, the Missouri Department of Natural Resources has analyzed the Modified Conservation Plan's (MCP) impact on the Mississippi River. It concluded that low flows on the Missouri River due to the MCP will coincide with low water on the Mississippi River at a frequency that translates into an impact on Mississippi River flows in 30 out of every 100 years. In stark contrast, the present Master Manual impacts Mississippi River flows in only 7 out of every 100 years.

Miss 4, 19

Some question the Corps' legal authority to manage the Missouri River for the incidental benefit of the Mississippi River, yet the Corps' authority is clear. First, the authorizing legislation gives the Corps authority to operate the Missouri River mainstem reservoir system to support navigation. The Pick-Sloan Plan does not specify that the Corps' authority is limited to supporting Missouri River navigation. Moreover, the Flood Control Act of 1944 speaks about the "Nation's rivers," not just the Missouri River. *See* 33 U.S.C. § 701-1. Second, the government has consistently taken the position that the reservoirs can be used to support navigation on both rivers. The legislative history bears this out. *See, e.g.*, H.R. Doc. 475, pp.17-18, 78th Cong., 2d Sess. (1944). Furthermore, in 1952, a joint working group from the Bureau of Reclamation, Regions 6 & 7, and the Missouri River Division published a report on the operation of the mainstem reservoirs. At page two, the report reflected the consensus that the reservoirs are to be operated for "the control of floods on the Missouri River below Fort Peck Dam and to lower flood crests on the Mississippi River; ...[and] to provide adequate controlled releases for navigation on the Missouri River and connecting inland waterways[.]" The Corps has relied on the work group's report as recently as 1990.

Miss 42

Flow reductions could also have disastrous impacts on fish and wildlife on the Mississippi. For example, reduced flows require more frequent channel dredging, and this may affect the

endangered pallid sturgeon. The potential for a conflict between the pallid sturgeon and Mississippi River commerce is more likely under Master Manual alternatives that provide for a low summer flow or split navigation season. However, the RDEIS offers only a passing glance at these impacts. Although the organizational structure of the Corps geographically divides division responsibilities at the confluence of the Missouri and the Mississippi, this is not a justification for a clear failure to examine the environmental impacts of the proposed alternatives which occur outside of the Missouri River basin.[3]

Miss 43

The RDEIS does not correctly or adequately attempt to evaluate the impacts of the various alternatives on the Mississippi River system. There is an undeniably interdependent relationship between the Missouri and Mississippi Rivers which the RDEIS fails to acknowledge. The management of the Missouri River can have drastic impacts on the Mississippi River as the Missouri Department of Natural Resources' (MDNR) evaluation of the Mississippi River modeling has shown. These impacts must be correctly evaluated and discussed in much greater detail than in the RDEIS. They must be evaluated for each alternative. The technical errors made by the Corps in its analysis, as detailed by MDNR, must also be corrected. A Supplemental RDEIS should be used to address these shortcomings of the RDEIS.

Miss 21

Ordinarily, a Supplemental RDEIS might be a piecemeal document that only addresses a particular issue like Mississippi River impacts or interior drainage. In this case, a piecemeal document that only addresses selected issues will not fulfill the goals of NEPA. The proposed action is far too broad and complex to tackle one issue at a time. To truly evaluate the cumulative effect of impacts, a single RDEIS must be subjected to public comment which adequately addresses all the issues. Otherwise, the public will not have any opportunity to comment on the cumulative impacts

Other 304

[3]The Corps should look to the Mississippi River for strategies to protect endangered species. The St. Louis District has a wildly successful "smart engineering program that demonstrated that the needs of native river species and humans can be met. *See* Environmental River Engineering on the Mississippi, USACE, St. Louis District.

of the proposed action and the Corps will not have the benefit of the public's collective wisdom to make its difficult decision.

Throughout this document, when we refer to a Supplemental RDEIS, we mean a second draft of the RDEIS which comprehensively and accurately addresses all the issues, not just particular issues singled out by the Corps for piecemeal treatment in a Supplemental RDEIS.

7. Power supply impacts: The RDEIS fails to provide the public with an understandable and detailed analysis about the alternatives' effect on powerplants that depend on Missouri River water for cooling and discharging heated water. The Corps' analysis assumes that these 25 powerplants will simply decrease power production to avoid violating their NPDES permits. This is a problem with an answer that is not as simple as the RDEIS assumes. Utilities have offered and will offer the Corps with their perspectives on this problem. Many utilities may try to retrofit their facilities at significant cost. Costs may be passed along to electric ratepayers. Retrofits may not be finished before the first summer low. Exorbitant replacement power costs or blackouts could result, either during retrofitting or prior to it. Utilities may find that they have no choice but to violate their NPDES permits, harming Missouri River fish and wildlife, contrary to the goals of the BiOp and the Corps. The Corps must consider these potential impacts to the environment, yet the RDEIS does not even consider that there might be impacts other than decreased power production and reduced utility profits from these lost sales.

MoPower 1, 3, 7

8. Interior drainage and agricultural impacts: The RDEIS does not adequately consider the impacts of the various alternatives on interior drainage and Missouri agriculture. As is evident from the many hearings held by the Corps, interior drainage is a primary concern of the people of Missouri who took the time to attend a hearing and put in their two cents worth. In fact, this comment was not restricted by state lines and was heard in several states. Even the South Dakota Legislature has objected. *See* SD H.C.R. 1002, 77th Leg., Reg. Sess. (2002). While the studies conducted by the Corps at a few selected locations indicate that impacts would be greater under the

Legal 25

Gavins Point alternatives, these studies do not inform the public what the total expected damages will be, nor do they tell a farmer what he can reasonably expect in his reach of the river. Executive Order 12630 requires federal agencies to conduct a takings analysis, yet we see no evidence of such an analysis in the RDEIS.

9. Tributary flood control impacts: The RDEIS does not consider the impact the proposed action will have on tributary flood control projects like Harry S. Truman Dam and Reservoir here in Missouri, or the Kansas River Reservoirs in Kansas. The Corps obtained flowage easements on private land adjacent to the Truman project based on the probability that the adjacent land would occasionally flood because of system operations. The Gavins Point alternatives change the probability of flooding-- which the private landowners bargained for with the Corps to obtain the necessary easements. Consequently, private landowners may be deprived of the benefit of the bargain they struck with the Corps. Ironically, the Corps may be just as responsible for such a deprivation as it was for the initial, authorized and compensated taking. This issue should have been considered.

Hydro 47

10. NEPA policy goals: The RDEIS does not adequately explain how the alternatives considered in it and decisions based on it will or will not achieve the policy goals of NEPA. 40 CFR 1502.2(d). This should have been addressed.

Other 317

11. Other alternatives: The RDEIS does not consider reasonable alternatives not within the jurisdiction of the Corps but which may more effectively remedy the need to which the Corps says it is responding. 40 CFR 1502.14(c). The Corps, which is not intended to be the federal expert in fish and wildlife management, has identified the preservation of certain protected fish and bird species as a need. The Corps is considering manipulating river flows in hopes of accommodating these species. The Corps has not considered any alternatives that do not simply alter the water flow regimen.

Other 318

In fact, flow manipulation may be counterproductive. A recently completed USGS census indicates that fluctuating water levels on rivers can be devastating to the piping plover. While piping plovers are declining elsewhere, the census indicated dramatic increases along the Missouri River, possibly attributable to favorable habitat conditions. Yet the Gavins Point alternatives propose to change these habitat conditions. Moreover, low lake levels appear to be favorable to the birds, and higher lake levels are part and parcel of all of the alternatives except the CWCP. EnSp 65

Changing river flows is not the only way to try to help the pallid sturgeon, interior least tern, and piping plover. Captive breeding programs, like Missouri's successful pallid sturgeon program, combined with off-channel habitat improvements and restorations, are not even considered in the RDEIS. They are the mainstays of conservation, however, and have been for years. Obviously, alternatives like these are reasonable ones which should have been considered by the Corps at least insofar as the Corps wants to help species which are listed as endangered. These alternatives should have been considered. MDNR will provide the Corps with other reasonable alternatives which the Corps should have evaluated and considered. These, and the "smart engineering already being applied by the Corps to other similar problems, are solutions which merit serious consideration. EnSp 26

12. Benefits to species: The RDEIS does not make clear that information is lacking about the supposed benefit of the proposed action to native riverine fish and bird species. Several stakeholders, including the State of Missouri, have notified the USWFS of their intent to sue regarding this deficiency and others in the BiOp. To name a few, the USFWS touts its BiOp as having a basis in sound science, yet contains hundreds of citations to "personal communications. [4] The BiOp's proposed hydrograph deviates significantly from the natural hydrograph it supposedly mimics. Higher reservoir levels are counterproductive to species recovery is this a solution in search of a problem? Perhaps most significantly, Corps analysis confirms the BiOp's failure to achieve desired features. EnSp 47 EnSp 52,59

[4]We understand that there is no documentary record of these "personal communications.

13. Discussion of alternatives: In general, the discussion of alternatives in the RDEIS is inadequate. The discussion of alternatives is the "heart" of the detailed statement requirement. 46 Fed. Reg. 18026, 18208. The RDEIS does not consider a sufficient range of alternatives considering the magnitude of the proposed action. See Natural Resources Defense Council v. Morton, 458 F.2d 827 (D.C. Cir. 1972). The RDEIS does not provide "information sufficient to permit a reasoned choice of alternatives. . . ." Id. The "rule of reason" requires an analysis of impacts to accompany each alternative. See id. The discussion of alternatives and environmental consequences is blurred making comparison difficult. See 46 Fed. Reg. 18026, 18028. The RDEIS does not provide adequate details of environmental consequences. See 40 CFR 1502.16. The RDEIS does not include appropriate mitigation measures for each alternative. See 40 CFR 1502.14(f). The RDEIS does not explain what alternatives were considered and summarily rejected or why they were rejected. See 40 CFR 1502.14(a). Other 319

The RDEIS contains an inadequate discussion of the socioeconomic impacts of the alternatives. See 40 CFR 1508.14. The discussion which appears in the RDEIS is general and non-specific. It does not tell a member of the public how the proposed action might actually affect them. The RDEIS treats socioeconomic impacts like mere words on a page and does not acknowledge that the proposed action will have a devastating effect on real people in terms of real dollars and cents. It will change people's lives. These impacts are very real and must be considered. Other 320

In short, a more comprehensive, less disjointed and better organized analysis of alternatives would have facilitated comparative review.

So far, this memo has been an overview of general legal observations about the RDEIS. To the extent that we have used specific examples to illustrate our points it is important to understand that the examples were only used for demonstrative purposes. Simply because we failed to mention many of the finer technical points addressed in MDNR's comment does not mean that we disagree with their observations. In fact, we concur fully with the technical comments made by MDNR.

When the specific, technical comments are viewed in connection with our general legal objections to the RDEIS, it is apparent that the RDEIS is woefully deficient.

The Corps is at a crossroads. The intersection the Corps has arrived at is one of very different interests and national policies. Many of the policies at this crossroads are in conflict. The RDEIS does not recognize these policies or the conflicts that exist between them. The following discussion identifies some of these conflicting policies.

Legal 26

Farmland Protection Policy Act

The purpose of this Act is "to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses, and to assure that Federal programs are administered in a manner that, to the maximum extent practicable, will be compatible with State, unit of local government, and private programs and policies to protect farmland." 7 U.S.C. § 4201(b). Although it is difficult to say because the Corps failed to adequately consider the impact of the alternatives on interior drainage, it appears likely that the adoption of any of the alternatives to the CWCP would result in the conversion of farmland to nonagricultural uses. It is not difficult to say that the Corps wholly failed to comply with the Act in the RDEIS.

The Natural Resources Conservation Service has promulgated regulations pursuant to the Act which provide guidelines and criteria for the Corps to follow to comply with the Act. See 7 CFR 658.4 and 7 CFR 658.5. The guidelines make it clear that the Corps cannot exempt itself from complying with the guidelines and criteria or the Act. See 7 CFR 658.4(e). The Corps should simply withdraw the RDEIS and go back to the drawing board and try to comply with the Act. Since that's probably not going to happen, the Corps must immediately comply with the Act and prepare a Supplemental RDEIS.

In enacting the Farmland Protection Act, Congress made of number of findings the Corps would do well to note. Congress wisely found, in part, that:

> . . . continued decrease in the Nation's farmland base may threaten the ability of the United States to produce food and fiber in sufficient

> quantities to meet domestic needs and the demands of our export markets ... and ... Federal agencies should take steps to assure that the actions of the Federal government do not cause United States farmland to be irreversibly converted to nonagricultural uses in cases in which other national interests do not override the importance of the protection farmland nor otherwise outweigh the benefits of maintaining farmland resources.

7 U.S.C. § 4201(a). The Corps has treated the management of the Missouri River as a basin-wide issue, but it is much larger than that. People outside the basin depend on crops grown in the region and shipped via the Missouri and Mississippi Rivers. Our nation depends on the basin's prime farmland to "feed the world." The Corps needs to accept the fact that the management of the Missouri River has these far-reaching implications and evaluate the impact the proposed action would have on grain prices, productivity, and our ability to compete on the international market.

Legal 27

Intermodal Surface Transportation System Policy

The policy governing transportation in this country is:

> . . . to develop a National Intermodal Transportation System that is economically efficient and environmentally sound, provides the foundation for the United States to compete in the global economy, and will move individuals and property in an energy efficient way.

49 U.S.C. § 5501(a). Congress envisions the National Intermodal Transportation System as the "centerpiece of a national investment commitment" which will "reduce energy consumption and air pollution while promoting economic development and supporting the United States' preeminent position in international commerce." 49 U.S.C. § 5501(b)(1) and (9). These policies were strongly reaffirmed when the transportation laws were the subject of comprehensive reform in 1994. See 108 Stat. 848 and 108 Stat. 1379.

The RDEIS ignores these policies by understating the value of navigation to the Nation's goals of energy efficiency and global competitiveness. The Corps needs to reexamine the importance of navigation to this Nation and take steps to facilitate rather than hinder the congressional vision of a National Intermodal Transportation System.

Nav 6, 8, 23, 35

Submerged Lands

Legal 28

The lands and natural resources beneath the Missouri River as it flows through Missouri belong to the State of Missouri. See 43 U.S.C. § 1311(a)(1). Missouri also has the right and power to manage the lands and resources beneath the Missouri River. See 43 U.S.C. § 1311(a)(2). Missouri's rights are subject to the navigational servitude. 43 U.S.C. § 1311(d) and 43 U.S.C. § 1314(a). The navigational servitude or "superior navigation easement" is "the privilege to appropriate without compensation which attaches to the exercise of the 'power of the government to control and regulate navigable waters in the interest of commerce.'" See United States v. Virginia Electric and Power Co., 365 U.S. 624, 627-628 (1961) quoting United States v. Commodore Park, 324 U.S. 386, 390 (1945). The United States retains only "its navigational servitude and rights in and powers of regulation and control of said lands and navigable waters for the constitutional purposes of *commerce, navigation, national defense, and international affairs*". See 43 U.S.C. § 1314(a). The United States has not reserved any other powers. Therefore, any other power over navigable waters and the land beneath them belongs to the states. See U.S. Const. Amend. X; and United States v. Rands, 389 U.S. 121, 127 (1967).

The proposed changes to the current CWCP enhance western recreational opportunities at the expense of navigation. Congress has only authorized the Corps to engage in works of improvement on the Missouri River for flood control and navigation. The preferred alternative subverts the navigational servitude contrary to the intent of Congress and the framers of the Constitution and it does this at the expense of rights reserved to the states.

Flood Control Act of 1944

Legal 29

In the RDEIS, the Corps tells us that it is striving to do three things in revising the MM: identify a Water Control Plan that (1) serves the contemporary needs of the basin; (2) complies with current environmental laws; and (3) serves Congressionally-authorized purposes. We understand what the latter two are, and appreciate the fact that the Corps must comply with federal law.

Other 337

However, we are left to wonder what the Corps means by the "contemporary needs of the basin. What are these contemporary needs? Is there a consensus regarding what they are and how best to serve them? Are they something other than Congressionally-authorized purposes? If so, why is the Corps striving to serve them? Shouldn't Congress tell the Corps what the needs of the basin are?

We think so. In fact, Congress has told the Corps what the needs of the basin are. The act of Congress that authorized the construction of the majority of the mainstem reservoir system we have today is known as the Flood Control Act of 1944. See Flood Control Act, ch. 665, § 1, 58 Stat. 887 (1944). The title says it all, evidencing the fact that for decades, Congress has wisely recognized the dangers floods pose to our Nation. The federal government has consistently and valiantly fought to protect the public from the dangers of flooding. In recognition of the fact that "destructive floods" are a "menace to national welfare," Congress has dedicated the Nation's resources to flood control "if the benefits to whomsoever they may accrue are in excess of the estimated costs, and if the lives and social security of the *people* are otherwise adversely affected." 33 U.S.C. § 701a (emphasis added). The Corps must remember the *lives of people* when it deliberates about contemporary needs.[5]

Other 7, 48
FC 1, 2, 4, 6

Flood control is a policy of paramount importance, however. In the declaration of policy of the 1944 Act, Congress said why they were authorizing the building of these dams:

> In connection with the exercise of jurisdiction over the rivers of the Nation through the construction of works of improvement, *for navigation or flood control*, as herein authorized ...

33 U.S.C. § 701-1 (emphasis added). The 1944 Act admits of only two purposes: flood control and navigation. This indicates the intent of Congress to authorize the works of improvement *for navigation or flood control*, not for recreation. Recreation is a secondary, incidental benefit rather than a project purpose or a national policy of comparable importance to navigation or flood control.

[5]The latest census data indicates that the vast majority of the people in the basin live below Gavins Point Dam, and most of them live in Missouri.

This is the Congressional intent that defines what the needs of the basin are. If they are no longer contemporary, Congress will tell us. They have not. FC 1, 2, 4, 6 (con't)

Congress goes on to provide the following:

> The use for navigation, in connection with the operation and maintenance of such works [of improvement] herein authorized for construction, of waters arising in states lying wholly or partly west of the ninety-eighth meridian shall be only such use as does not conflict with any *beneficial consumptive use*, present or future, in states lying wholly or partly west of the ninety-eighth meridian, of such waters for *domestic, municipal, stock water, irrigation, mining, or industrial purposes.*

33 U.S.C. § 701-1(b) (emphasis added). This indicates the intent of Congress to make flood control the predominant policy behind the authorized works of improvement because Congress did not place the same restrictions on the use of the works for flood control. Although Congress believed certain vested rights should take precedence over navigation, by negative implication, those vested rights are subservient to flood control, as is navigation. Congress only intended to prevent the destruction of state-created water rights. See Turner v. Kings River Conservation District, 360 F.2d 184 (9th Cir. 1966). It did not intend to create any new rights. Id.

Moreover, recreation west of the 98th meridian is not a beneficial consumptive use with priority. Even if recreation were a purpose of the Act, which it is not, recreation would not prevail over navigation and flood control because it is not a prior beneficial consumptive use.

The life and death importance of the policy favoring flood control is not adequately reflected in the RDEIS. Despite the lessons learned in the great floods of the 1990s, the RDEIS surprisingly returns to several alternatives include an annual man-made flood in the spring that could further jeopardize persons and property already subject to seasonal flooding. The Corps needs to carefully reconsider why the important policy of flood control, which has been the backbone of the Corps' civil works responsibilities for decades, was subjugated to the luxury of recreation.

"Congress in enacting NEPA, however, did not require agencies to elevate environmental concerns over other appropriate considerations." Baltimore Gas & Electric Co. v. Natural Resources

Defense Council, Inc., 462 U.S. 87, 97, 103 S.Ct. 2246, 2255, 75 L.Ed.2d 437 (1983). Although the policy goals set forth in NEPA are noble, they are really no more admirable than the policy goals articulated above. The Corps needs to remove its blinders and balance the competing policies.

Endangered Species Act Legal 30

The ESA requires all agencies to insure, in consultation with the Secretary of the Interior, that their actions are not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or modification of their habitat. 16 U.S.C. § 1536(a)(2). Here, the Corps has engaged in these consultations (called § 7 consultations in reference to the ESA section which requires them) with the Secretary, i.e., the USFWS. The ESA also requires the Secretary to provide a written opinion to the agency following these consultations (the BiOp). 16 U.S.C. § 1536(b)(3)(A). The ESA states that if jeopardy or adverse modification of critical habitat is found, the Secretary should suggest those reasonable and prudent alternatives which the Secretary believes would not jeopardize the species or modify their habitat. *Id.* The USFWS went far beyond making suggestions following the round of § 7 consultations which culminated in the BiOp.

The Corps' management of the dams is a complex feat of engineering. There is no better-qualified agency on the world for accomplishing this Herculean task than the Corps. On the other hand, the expertise of the USFWS lies in other branches of science. Instead of simply suggesting to the Corps what habitat or conditions the three endangered or threatened species need to recover, the USFWS has attempted to do the Corps' job instead of its own. The USFWS has stated that specific flow regimens are necessary, and suggest dire consequences if their recommendations are not followed. These changes in water releases from Gavins Point dam are no less than mandates. The USFWS defined a problem and dictated a solution. Only the former is within its authority under the ESA. Moreover, the USFWS' inability to do the Corps' job is repeatedly shown by detailed Corps analysis which clearly demonstrates that these flow mandates fail to achieve what the USFWS

says is biologically necessary. The Corps should recapture its control of the management of the Missouri River by considering the suggestions of the USFWS and developing alternatives that employ proven methods and achieve features that can recover endangered species instead of adopting flow modifications that are doomed to failure. Missouri believes that we can recover endangered species with habitat modifications and improvements, and has consistently demonstrated its commitment to this by doing it.

Conclusion

The RDEIS is deficient in a number of respects. The Corps has failed to comply with NEPA. The Corps should withdraw and abandon the RDEIS, because even if the defects we have raised are corrected, the suspect merit of an underlying decision to pursue an alternative to the CWCP will remain the same. The publication of a comprehensive Supplemental RDEIS is absolutely necessary to attempt to correct these defects if the Corps elects to proceed.

H:\BRYAN\BAMORIVER\COMMENT 2002.wpd

S0300001

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

JUDY H. MARTZ, GOVERNOR
1625 ELEVENTH AVENUE
STATE OF MONTANA
DIRECTOR'S OFFICE (406) 444-2074
TELEFAX NUMBER (406) 444-2684
PO BOX 201601
HELENA, MONTANA 59620-1601

February 12, 2002

Brigadier General David A. Fastabend
Commander, Northwestern Division
U.S. Army Division Corps of Engineers
P.O. Box 2870
Portland OR 97208-2870

Dear General Fastabend:

To follow up on my conversation with you and Larry Cieslik at the January 31st MRBA meeting in Denver, I would like for the Corps to implement the following recommendations for addressing the impacts of the Fort Peck spring rise.

As you know, Montana has given tentative approval to the spring rise demonstration project at Fort Peck, which is included in the February 12th proposed MRBA position statement that was discussed at the January 31st meeting in Denver. Our approval, however, is conditioned upon the Corps helping us mitigate the impacts of the spring rise. I recently met with water users and other interests in Glasgow and Culbertson and they made it very clear that their support of the spring rise is contingent upon the Corps adopting the following recommendations. These recommendations are very reasonable considering the magnitude of the spring rise over base flow at Fort Peck as compared to the proposed spring rise at Gavins Point.

other - 130

Montana Governor Judy Martz will still be sending the State's comments on the RDEIS draft before the February deadline, but I thought you needed an advance notice of our concerns and recommendations.

1) Corrections to RDEIS GP Model Runs

We were troubled to learn recently that lake level and flow output for Fort Peck and the stretch of river below the dam is flawed for the GP alternatives. While we appreciate the assurances you provide in your letter of January 22, 2002 that Fort Peck will share any savings accruing to the reservoir system under the GP alternatives, we are concerned that the letter offers no suggestions that the Corps intends to correct the problems with the model.

other - 84

Our analysis of the daily flow data for the GP alternatives for the summer months of the 1987-1993 drought period reveals the curious repeated appearance of discharge levels of 11,900 cfs. For the GP1528 alternative, each of the 217 days in July and 140 of the

217 days in August for the period has estimated average daily flows of 11,900 cfs (compared to median July and August flows of 3,650 cfs and 3,870 cfs, respectively, for the Current Water Control Plan). Clearly, overestimates of summer releases from Fort Peck are likely to have implications for Fort Peck as well as for the rest of the system. other - 84 (con't)

As you and your staff know, tremendous effort has been expended in the development of a model that allows comparisons of the relative effects of various operational schemes. Analysis of the data generated by the model provides us with a basis to make informed decisions regarding management of a complex river system. To learn that data for four of the six alternatives under consideration in the RDEIS contain substantial errors during a critical period, seriously impairs our ability to participate in the revisions of the Master Manual.

Recommendation

- We strongly urge the Corps to address the problems that prevent the model from generating reliable lake level and flow output. We are encouraged to learn from you that savings to system storage resulting from the GP alternatives will be shared equally among the big three reservoirs and we are eager to see the estimated lake levels and releases corresponding to such a proposal.

2) Impacts to Fort Peck Reservoir Levels

Montana would like the operating criteria for Fort Peck Dam to include more conservation to compensate for the impacts of the spring rise on Fort Peck reservoir levels.

Recommendation

- We would like the Corps to establish new conservation criteria for Fort Peck Dam and then rerun the model to assess the effect on the big three reservoirs and the river reach below Fort Peck--particularly during the 1980s drought. The new conservation operating criteria at Fort Peck should compensate for the effects of the spring rise. In other words, conservation measures should be implemented to offset the impact of higher spring releases on lake levels at Fort Peck.

3) River Channel Impacts between Fort Peck and Lake Sakakawea

Water users on the Fort Peck to Lake Sakakawea river reach based the designs of their water intake structures on historic water releases from Fort Peck Dam. The implementation of a spring rise will render many of the present structures unusable. An inventory of pumps and intakes on this stretch of the river conducted for the Corps indicates that approximately two thirds of the of 143 pumps could be impacted by higher river stages associated with spring releases of 23,000 cfs. Pumps could also be affected by higher velocities, changes to banks and channels, and larger amounts of debris. ErSd 5

Recommendations

- Protect the use of irrigation and municipal pump sites during and after the spring rise. Some of the pumps would need to be relocated to be usable at the higher water releases, others may only require rock fill. Montana supports the proposed language in the February 12th draft MRBA position statement that states the following about Fort Peck fish enhancement flows. " The Corps and MRBA should work closely with Congress, Montana and North Dakota landowners, and residents of the Fort Peck Indian Reservation to ensure that, before the fish enhancement flows begin, a program will be in place to compensate landowners who suffer damages as a result of the flow changes and to address adequately safety concerns." ErSd 6

- Continue to monitor the conditions of pumps and intakes below Fort Peck to assess the impacts of higher spring flows. Baseline information has already been collected through the Corps' inventory conducted during the summer of 2001.

- Create an Upper Missouri River Advisory Council to oversee the management of the river stretch between Fort Peck Dam and Lake Sakakawea. The Council should consist of landowners from Montana and North Dakota, representatives of the Fort Peck Tribes, officials from the States of Montana and North Dakota, U.S. Fish and Wildlife Service, the Environmental Protection Agency, and the Corps of Engineers. The Committee would be responsible for making recommendations on: other - 85
  - Adaptive management options for the river stretch;
  - Stop protocol procedures and criteria for the spring rise;
  - Warning procedures for the spring rise;
  - Recreation access sites;
  - Funding needs;
  - Fish, wildlife and water quality concerns; and
  - Bank stabilization and other issues.

- Provide funding to the Upper Missouri River Advisory Council so it can hire a River Coordinator. The Coordinator would staff the Upper Missouri River Advisory Council.

- Protect existing infrastructure such as bridges, etc. ErSd 7

- Winter releases should be lower than under current operations to diminish impacts to the banks and channel when ice is on the river. Other - 85

As you well know, the Corps spends enormous staff time and money working on the Missouri River stretch between Gavins Point and the confluence with the Mississippi River. The Corps spends very little money and staff time working on the 176-mile stretch of the river between Fort Peck and Lake Sakakawea. These recommendations

are inexpensive and would go a long way for Montana to continue its support for the spring rise at Fort Peck.

Sincerely,

BUD CLINCH
Director

cc. Senator Max Baucus
Senator Conrad Burns
Representative Dennis Rehberg
Richard Opper, Executive Director, MRBA
Larry Cieslik
Buzz Mattelin
Don Pfau

S0300002

DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

February 21, 2002

Project Manager
Master Manual Review and Update
U.S. Army Corps of Engineers
12565 West Center Road
Omaha NE 68144

RE: Comments from South Dakota Department of Environment and Natural Resources and Game, Fish & Parks on Revised Draft Environmental Impact Statement for the Missouri River Master Water Control Manual

Dear Project Manager:

The enclosed letter was read and submitted as testimony at the public hearing in Pierre, South Dakota on October 29, 2001. We are sending a copy to ensure it is part of the official record.

Sincerely,

Steven M. Pirner
Secretary

enclosure

October 29, 2001

U.S. Army Corps of Engineers
Attn: Project Manager, Master Manual Review and Update
12565 West Center Road
Omaha, NE 68144

Re: Comments from South Dakota Department of Environment & Natural Resources and Game, Fish & Parks on Revised Draft Environmental Impact Statement for the Missouri River Master Water Control Manual

Dear Project Manager:

Thank you for the opportunity to provide comments on the Revised Draft Environmental Impact Statement for the Missouri River Master Water Control Manual. This subject is not new to the Corps, South Dakota Department of Environment & Natural Resources (DENR) or Game, Fish & Parks (GF&P). For the past twelve years, the Corps has been engaged in a process to change the management of the Missouri River. Publication of the Revised Draft Environmental Impact Statement by the Corps which contains six different alternatives is a huge step forward. But this is no time to rest. It is time to study the alternatives, make the final decisions, and move forward with implementing a new Master Manual that works for the river.

Officials of the Corps have said the final decision or alternative must meet all three of the following objectives:

1. it must serve congressionally authorized project purposes;
2. it must serve the contemporary needs of the basin; and
3. it must comply with all applicable laws to include the federal Threatened and Endangered Species Act.

GF&P and DENR agree with using these three criteria to make the final alternative and decision. We believe that approach will result in the best plan for the entire Missouri River basin.

The Corps included the current Water Control Plan as one of the six alternatives in the Revised Draft Environmental Impact Statement. Using the three criteria above, it is clear the current 40-year old Master Manual cannot be the final alternative. When the mainstem dams were built, the vision for the river was one of flood control, hydropower, navigation, and irrigation. While flood control and hydropower followed the vision and have been very successful, irrigation and navigation have not. Less than 10 percent of the land authorized for irrigation under the Flood Control Act of 1944 is irrigated today. Only slightly more than 10 percent of the annual commercial navigation anticipated under the Flood Control Act of 1944 takes place today, and the Corps estimates it to be $7 million industry.

other - 76

Clearly, the contemporary uses of the Missouri River no longer reflect those 40-year old visions. Instead of using the river for large-scale irrigation and navigation projects, people have found other uses for the river. Fishing, boating, and recreation uses have increased ten-fold, and recreation is now an annual $87 million industry in the basin. However, the current Master Manual drains the upper basin reservoirs during even moderately dry periods to maintain navigation flows downstream and leaves recreational users high and dry. Therefore, the contemporary uses of the river demand that changes are made to the Master Manual and keeping the current Master Manual is simply not an acceptable option.

rec 8

The remaining five alternatives in the Revised Draft Environmental Impact Statement share several of the following changes from the existing Master Manual, all of which we strongly support:

- **Adaptive management** - In a river whose watershed encompasses one-sixth of the continental United States, there will never be "normal" conditions. There will be constant changes in the weather patterns, runoff, and river uses. Consequently, giving the Corps the authority and flexibility to address constantly changing conditions must be a component of the final decision. Having the Corps locked into the current inflexible Master Manual makes no sense, breeds hostility between the users of the river, and has driven certain species onto the federal threatened and endangered species list.

other - 77

- **Drought conservation measures** - The current Master Manual does very little for water conservation. America has entered a new era. We are no longer a country with unlimited natural resources. Upper basin states know conservation measures are important because we have seen the consequences of river management with little or no conservation measures under the current Master Manual. Low water levels in upper basin reservoirs eliminate recreational uses, devastate local economies, and increase the risk of having catastrophic drought impacts downstream. It is absolutely critical that drought conservation measures be part of the final decision.

rec 8

- **Unbalancing of the upper three reservoirs** - Unbalancing the reservoirs will improve habitat conditions for nesting terns and plovers and trigger spawning for the pallid sturgeon. At the same time, unbalancing of the reservoirs provides benefits to other fisheries in these three lakes. GF&P and DENR support the concept of unbalancing and recommend it be a component of the final decision.

EnSp 9
Fish 8

- **Flow modifications from Fort Peck reservoir** - Construction of the mainstem reservoirs has had very negative impacts to several of the native river species. Flow modification from Fort Peck is a logical and reasonable approach to help restore these species. If these species can be restored, the entire basin benefits by avoiding the potential court-ordered management of the river through the Endangered Species Act. GF&P and DENR strongly support the concept of flow modifications from Fort Peck when water availability makes it feasible.

EnSp - 9
Fish - 8
Other - 78

Four of the alternatives in the Revised Draft Environmental Impact Statement share the following attribute, which GF&P and DENR also support:

- **Flow modifications from Gavins Point dam -** As mentioned above, construction of the mainstem reservoirs has had very negative impacts on several native river species. Flow modification from Fort Peck when water availability makes it feasible has been largely agreed upon as a way to help restore these species. However, proposed flow modifications from Gavins Point have been much more controversial. GF&P and DENR support flow modifications from Gavins Point dam for the same reasons as we support flow modifications from Fort Peck.

EnSp 18

Of the four alternatives in the Revised Draft Environmental Impact Statement that contain flow modifications from Gavins Point, GF&P and DENR strongly support the Corps having the ability to implement the GP20/21 alternative through adaptive management. The science behind this alternative has gained nearly universal support from the technical fish and wildlife community and provides maximum recreational benefits for South Dakota. Missouri River recreation is critical to South Dakota's economy and quality of life.

Other - 79

This concludes our comments and recommendations for the Revised Draft Environmental Impact Statement. Using the criteria established by the Corps for selecting the final alternative, GF&P and DENR are confident our recommendations will become the Corps' final decision. We look forward to working with the Corps and the other basin states to implement the new Master Manual and maximize the beneficial uses and quality of life throughout the entire Missouri River basin.

Sincerely,

John L. Cooper
Secretary
Game, Fish & Parks

Steven M. Pirner
Secretary
Environment & Natural Resources

cc: Governor William J. Janklow
U.S. Senator Tom Daschle
U.S. Senator Tim Johnson
U.S. Congressman John Thune

S0300003

Nebraska Game and Parks Commission
2200 N. 33rd St. / P.O. Box 30370 / Lincoln, NE 68503-0370
Phone: 402-471-0641 / Fax: 402-471-5528 / http://www.ngpc.state.ne.us/

February 12, 2002

Brigadier General David Fastaben
U.S. Army Corps of Engineers, NW Division
Missouri River Master Manual RDEIS
12565 West Center Road
Omaha, NE 68144-3869

Dear Brigadier General Fastaben:

For the past 13 years, staff from the Nebraska Game and Parks Commission (NGPC) have been a part of the Missouri River Master Manual review process. We have been involved because as statutory stewards of fish and wildlife resources in Nebraska, we hope that operational changes will be made to enhance populations of Missouri River flora and fauna, including threatened and endangered species. Certainly, Gavins Point 2021 is the preferred choice for the Master Manual from a biological standpoint. Components of this alternative, including modifying reservoir releases to produce higher spring flows and lower summer flows in the river, would best address the U.S. Fish and Wildlife Service's Biological Opinion and avoid jeopardy status with the Endangered Species Act.

other- 79

EnSp 18

Gavins Point 2021 would, however, accomplish far more than bolstering populations of piping plover, least tern, pallid sturgeon, and the 51 other fish species native to the Missouri River now listed as rare, uncommon, and/or decreasing across all or part of their ranges. In Nebraska, most of our water-based recreational opportunities are in the western portion of the state, while most of the people live in the east. If the Missouri River was allowed to meander in some locations (as the National Academy of Sciences recommends) and water levels would more closely mimic the natural hydrograph (as per Gavins Point 2021), an outdoor recreational industry would be created along the Missouri River! Anglers, hunters and other outdoor users would flock to a more natural Missouri River and invigorate local economies in the process. Gavins Point 2021 is thus the best choice not only biologically, but socially and economically as well. Please help this become a reality.

Fish 3

Rec 6

Respectfully,

Rex Amack
Director

Printed on recycled paper with soy ink.

S0300004

Specific Comments from the North Dakota Game and Fish Department regarding the US Army Corps of Engineers RDEIS on the Missouri River Master Manual Review

Page 2-12 Intrasystem Regulation: discussion correctly focused on fish only and not the tern/plover nesting issue (which subsequently, at some point, was melded into the mix). | Fish 9

Page 3-32 (Table 3.5-2) Impaired Missouri River segments reported on CWA: question to the Corps or NDDOH - why such a range in values between states? | WQ 6

Page 3-36 (3.5.5) Water Quality Monitoring: this piece meal approach is further evidence for the need for MOREAP. | WQ 7

Page 3-37 (Table 3.5-3) USGS Water Quality Monitoring Stations on Missouri River: not aware of the various USGS sampling sites - data available? | WQ 8

Page 3-46 Sediment Releases of Nutrients and Metals - 2nd para: this paragraph implies there is some question about the existence/legitimacy of supporting data. Data does exist and has been forwarded to the Corps in previous correspondence. | WQ 9

Page 3-55 Lake Sakakawea: algal blooms occur in Sakakawea all years, often regardless of lake level. | WQ 10

Page 3-67 (3.6.3) Missouri River from Fort Peck to Lake Sakakawea: no mention of salt cedar - potentially some adverse impacts. | Other 17

Page 3-107 (3.9.2) Missouri River from Fort Peck Dam to Garrison Dam: which land was boughten in recent years "The Corps has also purchased land that can no longer be effectively farmed due to a high water tables ..."? | GW 1

Page 4-5 Environmental Recommendations: again no mention of benefits to terns/plovers in the reservoir reaches. | EnSp 9

Page 5-10 (Figure 5.2-6) Lake Sakakawea: noticeable improvement in lake levels for most of the alternatives. | Other 131

Page 5-11 (Figure 5.2-7) Missouri River at Bismarck: in reality there is little difference between any of the alternatives. Question the CWCP numbers - seems like it should be a lot less (e.g. for 50% of the years, flows have exceeded 55 kcfs 15-20 days per year?). | Hydro 2

lengthening the average navigation season will offset the industries' losses caused by reduced navigation due to restricted flows in the summer months. In contrast, an Archer Daniels Midland Company subsidiary corporation, American River Transportation Company (ARTC), has conducted assessments based on the Corps' data which quantifies potential negative economic impacts on middle Mississippi barge operations. ARTC estimates that Illinois businesses that are reliant on river navigation stand to lose between $7.5 million and $30 million per year. ARTC further maintains these losses cannot be recovered by an extension of the average navigation season. This estimate is clearly cause for concern by the State of Illinois, and demonstrates the necessity for impeccably thorough economic impact analyses. | Miss 26 (cont)

With respect to potential flood damage, it is difficult to imagine that increasing flows along the Missouri River can occur without a concomitant impact along the Mississippi River. With the devastation seen in recent years in Illinois communities impacted by floodwaters, I am wary of changes to Water Control Plans that could lead to or increase the severity of flooding along the Illinois borders. As you are well aware, the floods have devastating effects on agriculture, commerce and industry, jobs, residential communities, public facilities, transportation, utilities, etc. For example, according to Corps data, the flood of 1993 caused $752 million in damages to the State of Illinois. Although I recognize that the 1993 flood was an anomaly, I must emphasize that any increase in flood damages is unacceptable. | FC 8

In summary, I would like to thank the Corps for their willingness to provide detail and explanation of their studies to date through a personal briefing to my staff and Illinois industry representatives. I also commend the organization for providing the opportunity for public and private stakeholders to review and comment on the Revised Draft Environmental Impact Statement. I urge you to continue to study in great detail the potential transportation and economic impacts to the middle Mississippi River associated with each of the water flow release alternatives being considered for the Missouri River before a final alternative is selected.

Thank you for your consideration.

Sincerely,

George H. Ryan

GEORGE H. RYAN
Governor

Attachment

GHR/DCCA/KCB

Page 7-222 (Table 7.17.1) Impacts Summary for the Alternatives Selected: generally more improvements than negatives to the various resource categories.

Other 133

Page 7-226 Need for Awareness of Water Level Changes and Page 7-226 (7.18.2) Projects Currently Being Considered: seems rather heavy-handed and certainly not professional nor fitting for the purpose of an EIS. If the Corps is going to go out of its way discussing 'potential' downstream problems then it should do likewise throughout the basin.

Other 134

Page 7-230 (7.19) Depletion Analysis: good analyses regarding the value of water.

Page 7-235 (7.21.1) - 3rd paragraph - Constrain Higher Spring Flows while Moving Some Spring Rises To Extended Droughts: how are or will droughts be defined?

Other 135

Page 7-237 (7.21.2) Switch to Navigation Targets to Conserve Water in the System During Extended Droughts: why has it taken 13 years and $40+ million dollars of study to have this narrative? In the last paragraph of this page it states "This indicates that changing the release pattern makes a difference".

Other 136

S0300005

MISSOURI DEPARTMENT OF CONSERVATION

Headquarters
2901 West Truman Boulevard, P.O. Box 180, Jefferson City, Missouri 65102-0180
Telephone: 573/751-4115 ▲ Missouri Relay Center: 1-800-735-2966 (TDD)

JERRY M. CONLEY, Director

February 25, 2002

Ms. Rose Hargrave
U.S. Army Corps of Engineers
Northwestern Division
Attention: Missouri River Master Manual RDEIS
12565 West Center Road
Omaha, NE 68144-3869

Dear Ms. Hargrave:

The Missouri Conservation Commission and Department of Conservation staff appreciate this opportunity to submit the following comments regarding the Revised Draft Environmental Impact Statement (RDEIS) on the Missouri River Master Water Control Manual (Master Manual).

The Missouri Department of Conservation is the Missouri agency responsible for the control, management, restoration, conservation, and regulation of the fish, forest, and wildlife resources of the State of Missouri. This charge, vested in the Missouri Conservation Commission by the Missouri Constitution, makes the Missouri Department of Conservation a primary stakeholder in the process of revising the Missouri River Master Manual, especially as it relates to the Missouri River ecosystem, aquatic diversity, and recovery of endangered species.

Our comments are based on review of the Corps' RDEIS (COE 2001), the Missouri River Biological Opinion published by the U.S. Fish and Wildlife Service (USFWS 2000), the National Research Council's recent report (2002) entitled *The Missouri River Ecosystem: Exploring the Prospects for Recovery*, and a geographical analysis of Missouri River depths by Department of Conservation staff based on depth sounding data compiled by the Corps' Kansas City District (2001). Department staff interpolated the Corps' depth data to create a 3-dimensional representation of the Missouri River bed, which, in conjunction with water surface profiles also provided by the Corps, allows for estimation of depth at any point in the river when adjusted for differing flows. Details regarding this analysis and background information to support the recommendations described below are provided in the attached report entitled *A Missouri River of Many Uses: Policy and Flow Analysis by the Missouri Department of Conservation* prepared for the Missouri Conservation Commission, February 2002. The report is incorporated herein by reference.

The following key findings and recommendations are provided in response to the RDEIS.
1) The Department agrees with findings in the RDEIS , the Biological Opinion, and the National Research Council report that the ecosystem of the Missouri River has been drastically altered by construction of dams on the upper Missouri River and by channelization and bank stabilization, which have dramatically altered the pattern of natural flows and isolated the river from its flood plain in order to achieve navigation and flood control objectives. These alterations of the natural river, in combination with river management operations under the current Master Manual, have severely reduced the amount and quality of habitat for fish and wildlife in the Missouri River, jeopardizing the survival of species such as the pallid sturgeon, interior least tern, and piping plover. The RDEIS alternative to retain the Current

EnSp 9

Water Control Plan (CWCP) is biologically unacceptable to the Missouri Department of Conservation. Substantive changes in river management operations are needed now. EnSp 8,17

2) Losses of diversity to the Missouri River ecosystem include reduction in length of the Missouri River channel by 127 miles from Sioux City, Iowa to St. Louis, MO, with huge reductions in acreage of sandbars, islands, wetlands, and shallow water habitats. It has been estimated that one square mile of wetlands, oxbow lakes, meandering river, and mud flats was lost for each mile of shortened river channel. Sandbars and shallow-water habitats were among the most common and seasonally productive fish and wildlife habitats of the Missouri River prior to development. Roughly 105 acres of shallow, slow water habitat (0-5 ft depths and ~2 ft/second flow) per river mile existed in the Missouri River between Sioux City, Iowa and Kansas City, Missouri prior to development (USFWS 2000). The current acreage of shallow water habitat from Sioux City to the mouth is only 2-5% of the historical acreage (USFWS 2000). Restoration of exposed sandbars and associated shallow water habitats during late summer is the Department of Conservation's top priority for change to current river management operations. EnSp 2 Fish 10

We recommend a reduced summer flow, targeting 41,000 cfs at Kansas City, be provided during a six week period from August 1 through September 15 in six of ten years, as a component of adaptive management of the Missouri River under a revised Master Manual. Our analysis suggests that the ~41,000 cfs flow at Kansas City marks an "inflection flow" at which scarce biologically essential sand island and shallow water habitats emerge to benefit fish and wildlife and enhance river recreation from St. Joseph to St. Louis. The timing of increased flows following September 15 could also have important benefits for Mississippi River navigation. It should be noted that the proposal for a reduced flow of 41,000 cfs at Kansas City, as well as each alternative proposed in the RDEIS, should consider the effects of changes on Mississippi River navigation. EnSp 2 Fish 10 Miss 17

3) Our analysis of river depths suggests that the reduced flow of 41,000 cfs at Kansas City provides the Congressionally authorized 9-foot deep, 300-foot wide navigation channel from the mouth of the river to at least St. Joseph, Missouri. Analysis continues to determine if the proposed flow supports the 9-foot channel to Sioux City, Iowa, the beginning of the navigation channel. Our analysis of Corps data suggests that the Missouri River channel is sufficiently incised that navigation "target flows"included in the RDEIS may no longer be accurate in the 735 miles of the channelized Missouri River. These targets should be carefully reviewed for validity, as part of the Master Manual review, to preclude allowing outdated navigation targets to unnecessarily constrain the discussion of restoring a small measure of the river's ecosystem through flow adjustments. We believe navigation flows currently targeted by the Corps at selected cities along the channelized portion of the river are greater than required to provide the Congressionally authorized navigation channel. Nav 25

4) We are concerned that proposals to increase total system storage in the upper river reservoirs could significantly reduce the ability of the Corps to ensure that the River is managed to the benefit of all residents of the basin. The Corps must have adequate flexibility to respond to a wide variety of situations, both anticipated and unforeseen. We are concerned that proposed changes to storage levels in the upper lakes may limit the Corps' capacity to perform its statutorily mandated role. Furthermore, in light of the importance of endangered species in this discussion, we believe the effects of increased EnSp 3,20

storage levels on endangered species should be examined and data regarding impacts included in the review of these Master Manual proposals.

5) Some of the RDEIS alternatives propose a periodic spring rise, which would be achieved by releasing additional water from Gavins Point Dam during May in one of three years. The lower stretches of the Missouri River, including the entire 553 miles in Missouri, already receive a natural spring rise from tributary inflow. Although we are not advocating an additional spring rise for Missouri, scientific evidence has shown that species living in the stretch just below the Gavins Point dam would benefit from restoring a spring pulse. Nevertheless, we caution that the effects of a periodic spring rise on Missouri's agricultural community must be a top priority in consideration of this important Master Manual issue. We want the agricultural community along the Missouri River to remain viable and profitable in the twenty-first century, and we believe this can be achieved within the context of careful river management decisions. Other 20 FC 2 & 6

Finally, we conclude that the current Master Manual must be revised to achieve a finer balance among the project purposes summarized by the National Academy of Science (2002) report. If we are to achieve a "river of many uses" based on more balanced river management practices, a new flexibility or adaptive process that will take us far beyond the strictures of the current Master Manual must become the operating principle guiding management of the Missouri River. Other 35

Sincerely,

JERRY M. CONLEY
DIRECTOR

Attachment

c: Governor Bob Holden
Missouri Conservation Commission
Director, Missouri Department of Agriculture
Director, Missouri Department of Natural Resources
Director, Missouri Department of Economic Development
Director, Missouri Department of Transportation

Americans support protecting rivers but lack knowledge of them.
2001 poll finding by National Geographic, Geography Action Rivers program

WHAT WAS LOST IN HYDROGRAPHY AND HABITAT?

Changes to the Missouri River are not unlike changes made to other large rivers across this nation and in other industrialized countries. In fact, as Galat and Lipkin (1999) noted, a great challenge in measuring the past biological productivity of these resources is that, "...few naturally-flowing large rivers exist" (p. iv).

Virtually all major water development projects of the first-half of the 20th Century were political or "common sense" proposals that proceeded without any guidance of the fledgling fish and wildlife science of that time. Ironically, contemporary project supporters demand that any deviations from the original project purpose now be unequivocally and "scientifically" substantiated, rather than based on "common sense" or shifting politics.

But this extra burden of proof on fish and wildlife science is good. It demands that resource professionals move quickly and creatively to understand subjects that have been too long ignored or under-studied; advancing methodologies, collecting and analyzing data, proposing responses, and helping state and national citizenries to understand that the trade-offs between natural resource development and protection produces economic vitality as well as environmental benefits. Missourians tell us they think these factors can coexist to produce a high quality of life in our state and nation.

And the science of river biology is a subject about which we're learning more and more at a rapid pace, though some facts have been long-recognized (National Research Council 2002).

Changes in the Missouri's flows and loss of fish and wildlife habitat are unarguable facts.

Galat and Lipkin (1999) assessed the natural range of variation of the Missouri River's flow regime at 11 locations before (1929-1948) and after (1967-1996) mainstem impoundment. The 2,340 miles of the river were divided into three about-equal lengths: upper basin least-impacted (unchannelized), middle basin inter-reservoir (impounded by six mainstem dams), and lower basin (channelized), "...where flows are regulated by upstream dams and the river has been channelized for navigation, its banks stabilized, and flood-control levees are present." (p. iv).

They summarized:

> "Mean annual discharge for all stations ranged from 8 to 42% higher, inter-annual flow variability was lower, and flow predictability was higher in the post- than pre-regulation period. Flow regulation was associated with a reduction in magnitude and duration of the annual flood pulse, an increase in magnitude and duration of annual

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

> discharge minima, a reduction in frequency of annual low-flow pulses, earlier timing of March-October low-flow pulses, and a general increase in frequency of flow reversals with a reduction in the rate of change in river flows. These hydrologic alterations were smallest at two least-impacted upper-basin sites and most frequent and severe in inter-reservoir and upper-channelized river sections. The influence of reservoir operations on depressing the annual flood pulse was partially offset by tributary inflow in the lower 600 km of river, but the increase in low-flow discharge was not." (p. iv).

Simply, from Missouri's standpoint, the hydrograph of the river (the river's natural fluctuations in flow) was progressively dampened from pre- (1928-1948) to mid- (1949-1967) to post-regulation (1968-2000). Figure 1 depicts this transition in curves with three average annual flows at Kansas City, Missouri. As noted by Galat and Lipkin, a semblance of a spring rise remains in the post- versus pre-regulation flow, but the low summer flow of the pre-regulation river was replaced with the higher flow of mid-regulation, and a still-higher flow of post-regulation.

Compounding flow changes was habitat loss. A seminal work among contemporary habitat studies was the MDC's "Changes in the channel of the lower Missouri River and effects on fish and wildlife" (Funk and Robinson 1974). By comparing 1879 and 1954 maps of Missouri River stretches, the authors quantitatively and descriptively documented habitat loss due to the channelization and bank stabilization projects.

> "Radical changes have been impressed upon the surging brown Missouri River in the years since Lewis and Clark threaded their boat up a sprawling river studded with islands and sunken timber. ...Much of the danger from caving river banks recorded in their diaries is gone, but to move a keelboat against the swift current of a now-constricted river would be a nightmare of poling and straining at the dreaded *cordelle* (tow rope).
>
> Much of the Missouri's change has been wrought in the [20th] century; it is doubtful even renowned pilots of bygone steamboating days such as Captain Bill Heckman of Hermann could find their way on the river. The 'marks' Heckman used are gone. But old river hands would find a deeper channel and less threat of running aground. They might like the 'new' river, for many big changes have been made to benefit navigation, though the fish and wildlife that were part of the historical river scene have been greatly diminished by those same changes.

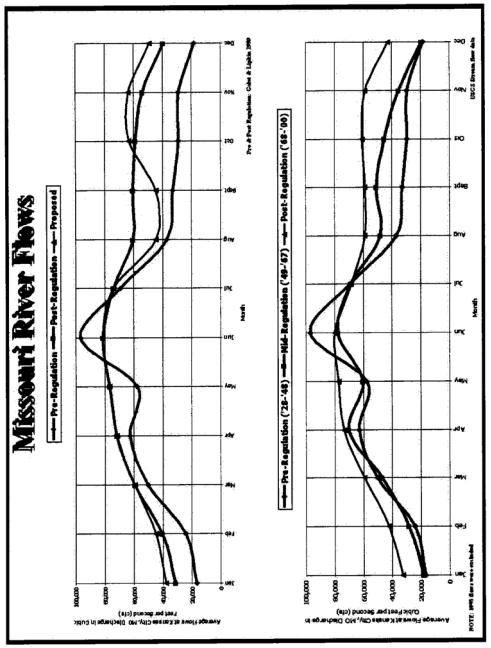


Figure 1. Missouri River Flows: Pre- and Mid-Regulation, Post-regulation (CWCP) and Proposed (~41,000 cfs).

> ...Unconnected islands were practically eliminated from the Missouri River between 1879 and 1954. The surface area of islands was reduced from 24,419 acres to 419 acres, a loss of 98%. The number of individual islands was reduced from 161 in 1879 to 18 in 1954. ...The islands, with rich alluvial soil, often provided luxuriant cover for wildlife, but usually were cleared by adjacent landowners and put into cultivation when they became connected to shore.
>
> The chutes or sloughs between the islands and shore, more shallow and with less current than the main channel, provided valuable diversity to the fish habitat, probably serving as nursery and feeding areas for many aquatic species. They provided favored fishing places, sheltered from the hazards of the main channel and offering opportunities to catch a variety of species. *The loss of the islands is a loss to recreational opportunity in both fisheries and wildlife, and a loss to the diversity of the river environment."* (italics by Funk and Robinson 1974) (pp. 2-3).

Funk and Robinson (1974) summarized these changes:

> "In the 93 years between 1879 and 1972 the water surface area of the Missouri River between Rulo, Nebraska and the mouth has been reduced by 50%. Islands have been virtually eliminated. The chutes or sloughs which separated the islands from the shore are gone, along with other forms of backwater habitat." (p. 39).

More recently, Galat and Lipkin (1999) confirmed:

> "Loss of the braided channel geometry of the lower Missouri River through channelization has eliminated most sand island and shallow in-channel habitats used by riverine fishes for spawning and nursery. What few low-elevation sand islands and associated shoals that remain are now flooded or their surface area reduced during part (July-September) of the reproductive season for many riverine fishes, as well as for birds and turtles that make similar use of these critical habitats. Additionally, protracted summer-fall high flows prevent germination of early-successional tree species and moist-soil annual vegetation in habitats that remain along the narrow, steep-sloped channel of the lower Missouri River.
>
> ...Sustained reservoir water releases during the naturally low-water season cause protracted flooding of about two-thirds of the Missouri River and may be as pervasive and damaging a disturbance as reduction of the annual June flood pulse." (pp. 50-52).

The environmental awakening of the 1960s set the stage for reclaiming some natural values of the Missouri River. Changes were made to operation and maintenance of the navigation channel. Dikes were notched to create plunge pools, rock sizes were varied to improve fish nesting and cover in dikes, banks along publicly-owned stretches were opened to hydrologic

processes, and the COE more closely coordinated channel maintenance with state fish and wildlife agencies.

Actions were taken to recover fish and wildlife habitat along the river under four initiatives. First, the Missouri River Fish and Wildlife Mitigation Project, initially authorized in 1986, seeks restoration of aquatic habitat lost by past channelization, restoration of bottomland forest and other lost terrestrial habitat, and improvement of conditions along the river for threatened and endangered species. The project area extends 734 river miles from Sioux City, Iowa to the mouth of the river at St. Louis, Missouri. The 1986 authorization of 48,100 acres was expanded by a 1999 authorization of an additional 118,650 acres to be acquired from willing sellers (Figure 2).

Second is the Big Muddy National Wildlife Refuge. Authorized for an eventual public ownership of 60,000 acres, the impetus for this habitat project was the Missouri River's Great Flood of 1993, leaving thousands of acres of particularly flood-prone land deep in sand. The USFWS was authorized to acquire these lands from willing sellers from Kansas City to St. Louis, Missouri, and the lower 10 miles of major tributaries (Figure 2).

Third are conservation areas under MDC's management in the Missouri River flood plain. Acquisition both before and after The Great Flood of 1993 has yielded a total of 44,977 acres in 72 areas (Figure 2), with notable acreages at Columbia Bottom at the confluence of the Missouri and Mississippi Rivers in St. Louis, and a cluster of areas in central Missouri.

Fourth is the Wetlands Reserve Program (WRP) administered by the Natural Resources Conservation Service. The program reimburses landowners for permanent easements, 30-year easements, and restoration cost-share agreements to restore, enhance, protect, maintain, and manage wetlands; landowners control access to the land. About 21,700 acres are enrolled in WRP in the Missouri River floodplain in Missouri (Figure 2).

These projects will restore just a small portion of the Missouri's floodplain for public benefits of fish, wildlife, recreation, and floodplain management--what has been called a "string of pearls." Critics decry public intrusion in the private floodplain, although 85 percent of the roughly one million acres in the river's floodplain in Missouri will remain in private ownership. Moreover, though not yet conclusively quantified, anecdotal testimony by private landowners strongly suggests that reconnecting even a small portion of the floodplain to the river at these public sites has attenuated several short-term flood crests, protecting private landowners' assets.

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

Missouri River Flood Plain

Fish, Forest, and Wildlife Public Lands and Private Easements

	Acres Authorized	Acres Acquired
Missouri Department of Conservation		
72 Areas	**N/A**	**44,977**
Missouri River Mitigation Project		
1986 Authorization	**48,100**	**14,609**
1999 Authorization	**118,650**	**0**
U.S. Fish and Wildlife Service		
Big Muddy National Wildlife Refuge *	**60,000**	**7,178**
*** Includes ~ 2000 acres of Mitigation lands**		
Natural Resource Conservation Service		
Wetland Reserve Program (WRP)	**N/A**	**21,740**
Grand Total	***226,750***	***88,504***

Figure 2. Authorized and acquired acreages to restore lost habitat along the Missouri River in Missouri.

But the Missouri River ecosystem was molded by not only land, but water, and more specifically, water flows; we changed these flows.

Roughly 105 acres of shallow slow water habitat (0-5 foot depths and ~2 feet/second flow) per river mile existed in the Missouri River between Sioux City, Iowa and Kansas City, Missouri prior to development for navigation and flood control (USFWS 2000). The current acreage of shallow water habitat from Sioux City to the mouth is only 2-5% of the historical acreage (USFWS 2000).

Restoring more of this habitat type in the Missouri River has been deemed critical in recovering not only pallid sturgeon, *Scaphirhynchus albus*, but also for a variety of other native fish species (USFWS 2000). Yet sparse information exists on specific microhabitat needs of adult pallid sturgeon (Bramblett and White 2001); virtually none exists for young-of-year pallid sturgeon. Research conducted for other sturgeon species inhabiting large river systems must be used to hypothesize what habitat conditions young pallid sturgeon need.

Rearing habitat of white sturgeon, *Acipenser transmontanus,* has been examined in the lower Columbia River (Parsley and Beckman 1994). They found that young-of-year white sturgeon used a wide variety of water depths, but never used habitats where mean water column velocity exceeded 2 feet/second.

The current in the main channel of the Missouri River has a velocity of 3 to 7 miles/hour. This is equal to a flow rate of 4.4 to 10.3 feet/second. While limited work has been conducted on availability of slow water (<2 feet/second) habitat within the Missouri River, we would argue that based on flow rates in the main channel of the river, slow water habitat is limited to areas near the water-shoreline interface (likely areas less than 1 to 2 feet in depth), and near shallow sand island complexes and backwater areas. These habitat complexes have been shown to be important for both larval and juvenile fishes (Tibbs 1995, Kubisiak 1997, Tibbs and Galat 1997), as well as the benthic invertebrates that these fishes feed upon (Beckett et al. 1983, Thorp 1992). These slow-velocity habitats are particularly critical for developing larval fishes. Sustained swimming speeds of most fish, including larvae and juveniles, are 3 to 7 body lengths/second (Webb 1975). Most larval fishes are less than one inch in length. Thus, maximum sustained
swimming speed for this life stage would be about 0.5 feet/second (7 inches/second), further showing the importance of the availability of shallow water and sand island habitats within the Missouri River.

Late summer flows within the pre-development Missouri produced abundant shallow water habitat, providing aquatic resources, especially larval and juvenile fish, with places to feed, grow, and gain refuge from predators. With little or no shallow water habitat, it is more difficult for native river species to produce young and survive. Hence, changes in the structure and flow of the river have adversely affected a number of aquatic species. The

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

commercial fish catch decreased by 80% from 1945 to 1963 (Funk and Robinson 1974), and 16 species of fish in the lower Missouri River basin are now considered rare, threatened, or endangered (SAST 1994). Anglers no longer report catching 200+ pound blue catfish, *Ictalurus furcatus*, in the Missouri River (Funk and Robinson 1974).

"Loss of the braided channel geometry of the lower Missouri River through channelization has eliminated most sand island and shallow in-channel habitats used by riverine fishes for spawning and nursery. What few low-elevation sand islands and associated shoals that remain are now flooded or their surface area reduced during part (July-September) of the reproductive season for many riverine fishes, as well as for birds and turtles that make similar use of these critical habitats. Additionally, protracted summer-fall high flows prevent germination of early-successional tree species and moist-soil annual vegetation in habitats that remain along the narrow, steep-sloped channel of the lower Missouri River" **Characterizing the Natural Flow Regime of the Missouri River Using Historical Variability in Hydrology (Galat and Lipkin, 1999, p. 52)**

REDUCED SUMMER FLOW

Overview

MDC offers to the discussion of adjusting the Master Manual the possibility that the Missouri River channel is now so deeply incised that navigation "target flows" are no longer accurate in the 734-miles of the channelized river (Reservoir Control Center 2000). These outdated targets have unnecessarily constrained the discussion of restoring a small portion of the river's ecosystem through flow adjustments.

MDC recommends a reduced summer flow of ~41,000 cfs at Kansas City during August 1 to September 15, in 6 of 10 years, as a component of adaptive management of the Missouri River under a revised Master Manual. (Figure 1, p.14).

A long line of eminent fisheries and wildlife researchers tell us this reduced flow period is a significant late-summer moment in river time that has been lost with the CWCP. For illustration, the average August flow at KC since project completion in the mid-1960s is about 60,600 cfs. The proposed ~41,000 cfs thus is a substantial departure from flows in recent decades, and much more akin to pre-regulation August flows that averaged 37,000 cfs (Table 1).

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

Table 1. Comparison of averaged daily mean flows for August, Pre-, Mid-, and Post-Development, Missouri River, Kansas City, Missouri.

Pre-Regulation		Mid-Regulation		Post-Regulation	
Year	CFS	Year	CFS	Year	CFS
1929	35,487	1949	40,519	1968	61,016
1930	30,077	1950	76,584	1969	64,852
1931	19,765	1951	99,161	1970	48,690
1932	44,139	1952	46,926	1971	53,726
1933	25,194	1953	38,319	1972	62,855
1934	12,477	1954	52,255	1973	58,697
1935	28,529	1955	28,926	1974	43,239
1936	14,948	1956	39,532	1975	68,429
1937	34,871	1957	38,919	1976	43,452
1938	43,784	1958	64,255	1977	54,703
1939	30,574	1959	45,268	1978	65,858
1940	35,971	1960	49,068	1979	59,132
1941	29,539	1961	41,245	1980	43,223
1942	43,997	1962	44,345	1981	58,342
1943	41,897	1963	37,532	1982	66,345
1944	73,103	1964	39,213	1983	56,990
1945	52,132	1965	43,452	1984	63,148
1946	30,335	1966	43,729	1985	65,981
1947	46,732	1967	46,448	1986	70,532
1948	69,642	**Avg.**	**48,195**	1987	68,987
Avg.	**37,160**			1988	36,990
				1989	38,381
				1990	50,913
				1991	33,855
				1992	70,771
				1993	144,313
				1994	47,381
				1995	73,926
				1996	89,742
				1997	79,468
				1998	66,784
				1999	69,765
				2000	40,794
				2001	41,729
				Avg.	**60,677**

A MISSOURI RIVER of MANY USES: POLICY AND FLOW ANALYSIS

Attachment to S0300005

25 February 2002

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

TABLE OF CONTENTS

ABSTRACT 2

INTRODUCTION 5

HISTORICAL PERSPECTIVE 7

WHAT WAS LOST IN HYDROGRAPHY AND HABITAT? 12

REDUCED SUMMER FLOW 20

Overview 20
Method 22
Results 24
Discussion 32
Depth Class Maps 33
Virtual Fly-Throughs (.avi files) 37

ECONOMIC BENEFITS OF ENHANCED OUTDOOR RECREATION 38

STURGEON MONITORING PROGRAM 41

ADAPTIVE MANAGEMENT IS FUNDAMENTAL 43

CONCLUDING REMARKS 45

REFERENCES 46

APPENDIX A 52

APPENDIX B 55

A Missouri River of Many Uses:

Policy and Flow Analysis

Missouri Department of Conservation

Daniel J. Witter, Ph.D., Policy Coordination Chief
Rochelle Renken, Ph.D., Wildlife Research Biologist
Vincent Travnichek, Ph.D., Fisheries Research Biologist
Kevin C. Borisenko, Geographic Information Systems Specialist
Lee G. Hughes, Geographic Information Systems Specialist
Gordon Farabee, Policy Coordinator (retired)
John W. Smith, Deputy Director
Norman Stucky, Fisheries Division Administrator

ABSTRACT

This report presents an alternative to the U.S. Army Corps of Engineers' (COE) proposals in the Revised Draft Environmental Impact Statement (RDEIS) for the Missouri River Master Water Control Manual (Master Manual). The Missouri Department of Conservation (MDC) geographically analyzed river depths produced by a Missouri River flow of approximately (~) 41,000 cfs at Kansas City (KC), Missouri, and compared them to depths at flows under the Current Water Control Plan (CWCP). MDC analyzed the channelized river from St. Louis, Missouri, to north of St. Joseph (river mile 476) using bathymetric data obtained from the COE in late-fall, 2001.

Generally, compared to CWCP, the ~41,000 cfs KC flow nearly doubled the amount of shallow water less than 5 feet deep, and more than doubled the amount of very shallow water less than 1 foot deep. We hypothesize that the ~41,000 cfs flow marks an inflection-flow around which scarce and biologically essential sand island and shallow water habitat associations emerge to benefit fish and wildlife, and enhance river recreation, at least from St. Joseph to the river's mouth. Targeting ~41,000 cfs at KC during a 6-week late-summer period, from August 1 to mid-September, in 6 of 10 years, would constitute an important science-based and adaptive reduction in the artificially high late-summer flows of the engineered, channelized river since 1965.

Coincidentally, analysis indicates that this ~41,000 flow provides the Congressionally authorized 9-foot deep, 300-foot wide navigation channel from the mouth of the river to at least north of St. Joseph, Missouri (river mile 476). Analysis continues to determine if the flow supports the Congressionally authorized channel to Sioux City, Iowa, the beginning of the navigation channel. This finding suggests that the long-quoted navigation target flows thought necessary to support "full-service" navigation at various reaches of the channel could be inaccurate, likely attributable to decades of channel-training and incision.

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

We would strongly caution that any reduced flow intended to produce fish and wildlife habitat benefits should be modeled and thoroughly documented throughout the channelized river before implementation (as is now possible, given time, with the geographic technology we are advancing). Not only is there a point at which reduced flow negatively impacts navigation, but there also may be an inflection or "bounce" point at which shallow water habitat gains from reduced flow are lost or reversed. This might occur if the scarce sand island/shallow water complexes interior to the high banks of the river are de-watered by reduced flow, with water retreating to the single, main channel. We are continuing to search for this possible lower inflection flow where fish and wildlife habitat benefits might actually diminish with reduced flows.

This report,

(1) recommends a reduced summer flow of ~41,000 cfs at KC during August 1 to mid-September, in 6 of 10 years, as a component of adaptive management of the Missouri River under a revised Master Manual.
(2) demonstrates a methodology for coarse, large-scale estimation of riverine habitat for fish and wildlife,
(3) estimates associated economic benefit of enhanced outdoor recreation,
(4) describes plans to monitor the fish and wildlife response to reduced flow over ten years, and
(5) summarizes adaptive management and its rationale for the Missouri River.

Data are summarized in frequency tables and maps, as well as computer animation. We assert that visual, virtual, geographic, larger-scale river analysis reported here, after the example of Funk and Robinson (1974)--generally lacking from any of the current Master Manual deliberations--is absolutely essential to communication among resource and policy professionals and stakeholders on inter-state water development issues. Computer-animated analyses provide the best and perhaps only method that ordinary people, informed laymen, and resource professionals can use to communicate on complex resource issues such as Missouri River management. Animated demonstrations should become the new standard for technical presentations at public meetings and workshops about the river.

Visual, large-scale demonstrations of flow manipulations will help supplant the misinformation, inter-state mistrust, "data-duels," fear, and hyperbole that have plagued the Master Manual process and produced the "analysis-paralysis" bemoaned by most stakeholders in Master Manual decisions for over a decade. New computer and geographic information technologies enable clear thinking that should drive the win-win business approach citizens expect of their public servants in the twenty-first century.

The authors thank the following peers for their reviews, cautions, and criticisms of portions or all of the concept, methodology, techniques, and results in this report. ***The authors purport no endorsement by these commenters*:** Robb Jacobson, (U.S. Geological Survey); Doug Latka, Bruce Vander Lee, Casey Kruse, Al Svoboda, Larry Murphy, Bryan Baker (COE); Del Lobb, Bill Turner, Anthony Spicci, and Ellen Ehrhardt, (MDC).

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

INTRODUCTION

The Missouri River is changed forever; irrevocably dammed in the upper basin, and channelized in the lower stretch for 734 miles from Sioux City, Iowa to the confluence of the Mississippi and Missouri rivers at St. Louis.

We worked hard as a nation, region, and Missouri state to change the river over many decades. Some results were good and as planned, some not. Bare-knuckled politics dictated the changes; an accepted process, but one that noted historians say showed both fair and foul treatment of the body politic (Ambrose 1996, Barry 1997, Schneiders 1999).
The COE sets water release schedules for the Missouri River mainstem dams using guidance in the Master Manual. Decisions regarding water schedules from the Missouri River dams ultimately determine the distribution of the river's water benefits.

In Missouri's case, these multi-purpose regulatory reservoirs--dams once so welcomed to store and meter the river's water for lower basin flood control and navigation--today feed some Missourians' high anxieties that farm, industry, municipal, recreation, and Native American entrepreneurs in the upper basin will shortstop, export, and sell water, reducing in-stream flow to Missouri, like today's Colorado River.

A small portion of the river's original, immeasurable natural richness can be reclaimed, should we choose. But we must understand that the river is changed forever and that which can be reclaimed is marginal.

Yet, the small part we might restore is important.

Channelizing 734 miles of the lower river was an enormous long-term endeavor, and had huge effects on the Missouri River ecosystem.

Low flows during winter, 2001-2002, exposed portions of the massive structures constructed during the twentieth century to train the river's flow for navigation and bank stabilization. For example, a late-December 2001 river inspection near Jefferson City, Missouri encountered some shorter wing dikes (rock structures roughly perpendicular to the channel) standing fully exposed for hundreds of feet. The rock tonnage and human sweat in just one wing dike staggers the mind; each one is a stone monument to the spirit of American enterprise. Yet hundreds were engineered over decades by thousands of workers using construction technology just a few generations removed from America's industrial revolution (Schneiders 1999).

Low flows of winter 2001-2002 revealed the scale of L-head or trailing dikes in the channel proper. Wide, elongated rows of huge rock tower above the river's surface yet plunge into rushing depths that sonar showed as 15-, 20-, 25-feet--and deeper still.

And at many locations closer to shore there were barely detectable rows of nearly century-old pine and cypress pilings pounded deep into the river-bed and disappearing laterally into the banks. The bank-top is now high above the pilings, but the huge, old sunken logs remind one that many decades ago they stretched across miles of expansive, biologically rich and braided river channel. These pilings stood as patient sentinels slowly capturing, holding, and transforming Big Muddy's sediment to organically super-rich flats that accreted to private property as the river retreated to a single, main channel.

This new acreage--naturally vegetated at first, but then cleared for crop production--was among the first economic benefits trumpeted by early twentieth century politicians and proponents of river channelization (Ferrell 1996). Not surprisingly, this land is fiercely defended today by bottom-landowners as their entitlement from the Missouri River bank stabilization project.

But low flows of 2001-2002 provided a more penetrating view of the Missouri River. Remnants of sand islands and associated shallow water habitat for fish and wildlife were revealed; a biologically productive and organically rich association of sediment, water, and current that once constituted an essential component, at the right time, for biota in the complex ecosystem that was the Missouri River. This reduced-flow habitat association is scarce under the CWCP that averages or mutes spring and early-summer peaks of high water and late-summer and fall troughs of low water--peaks and troughs that were the ways the river flowed for thousands of years before river alterations and channelization were finalized in 1981.

This report analyzes depth and habitat from a reduced summer flow targeting ~41,000 cfs at Kansas City, and compares depths at this flow to flows under the CWCP. The premise of this analysis is that the Missouri River has become, and must remain, a river of many uses, supporting commercial and water supply needs--but ecosystem and recreational values, as well. Restoring a more frequent reduced summer flow is an important adaptive step in rejuvenating the channelized, lower Missouri River ecosystem.

Findings suggest that navigation flows currently targeted by the COE at selected cities along the channelized portion of the river may be greater than required to provide the Congressionally authorized navigation channel. This is attributable to decades of channel incision.

We conclude that the current Master Manual must be changed to achieve a finer balance among the project purposes summarized by the National Research Council (2002), especially in light of the U.S. Fish and Wildlife Service's Biological Opinion of 2000 (USFWS 2000) and the RDEIS (USCOE 2001). A new flexibility or adaptive process well beyond the strictures of Master Manual must become the operating principle guiding management of the Missouri River.

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

"Like the hydrologic cycle, which is ultimately a system of rebirth, human beings, too, come around to new ideas and understanding. Once, pegging down the bully river, creating the sinuous navigation channel, was the ideal feat. Building dams too became the focus of achievement. Now the center of activity is on environmental restoration."
SOUNDINGS: 100 Years of the Missouri River Navigation Project (John Ferrell, 1996, p.145)

HISTORICAL PERSPECTIVE

The motion picture of the late 1950s, *How the West was Won*, brought to life in stunning cinematography and thrilling music the epic of the American pioneer. Against the spectacular scenic backdrop of the American landscape, the story told of people forging west--most of them searching for a new home and dream, some of them fleeing the law, some of them fleeing people and civilization, some seeking fortune, but some of them spurred simply by the burning curiosity to discover what was beyond the next hill or mountain.

Eastern pioneers struck West on the Erie Canal to the Ohio River Valley; they went out onto the Mississippi River, onto and up the Missouri River, and then into western history. But these settlers were not aware that they were making history. They were too busy coaxing mules and oxen onward, through mountain snows, numbing cold, desert heat, and through valley mud. They were too wearied from burying those unable to stand the hardships.

At times, they fought and feuded among themselves. Sometimes they fought dark-skinned people that today we understand had roots in Asia, people who answered the wanderlust thousands of years earlier to explore a thin strip of northern land connecting continents following food or better fortunes.

Sometimes the settlers fought wind. And sometimes, they fought water.

The haunting song Shenandoah tells of a western pioneer's yearning for lost love, that of his familiar home far back east in Kentucky, Tennessee, or Virginia, and perhaps of a lover left behind. Standing in the way of reunion with these lost loves was the huge and terrifying obstacle that history would come to symbolize as both the gateway to the West, and as an uncontrolled brute ready to sweep away pioneer progress, the Missouri River.

Our American democracy is not very old as some go, say, Great Britain; not very populous as some democracies go, say India. But we are unique and blessed. We have accepted political processes. We raised the most powerful yet benevolent armed services ever. And we take for granted the world's highest standard of living and daily blessings of bountiful food and fiber.

To claim this destiny, we used, committed, and changed our nation's vast but not limitless natural resources, including the Missouri River. To control the Missouri River's seasonal flood ravages while spurring economic and commercial development, the river was dammed in its upper basin, and channelized in its lower basin in a long history of political and funding struggles with origins before the Civil War (Ferrell 1996, Barry 1997, Schneider 1999).

We should not be smug in judging these changes, wondering how people could have been so shortsighted, greedy, quick to consume, or whatever. Pioneers were busy building the nation and infrastructure that we inherited and now enjoy. They built the nation in ways, maybe the only ways, that made sense to them.

But nor should we delude ourselves, insisting that all changes had perfect outcomes.

Because we are a unique democracy, because we care about this country, because we must assume responsibility for its care from generations who sacrificed for us, it is always appropriate for us to revisit decisions that time and events have shown to have some questionable consequences on our nation's natural resources. Perhaps we can lessen or mitigate those after-effects by working together and being smart, reasonable, and prudent.

Surveys for MDC (MDC 2000) suggest that Missourians expect this self-evaluation. They think economic vitality and environmental quality can go together, and look for their public servants to promote both, to the betterment of our Missouri and Midwestern quality of life.

Today, our nation, region, and state have questions about changes to the Missouri River. Can we restore some things that we lost, or save some things that even today we seem to be losing, and allow the Missouri River to be a 21st Century river of many uses?

Contemporary champions of status quo often criticize those exploring environmental restoration as irresponsible extremists lacking common sense. "How can you even think of setting the clock back?"

Among the first to ask for restoration of our nation's natural resources was no less than the "greatest generation" (Brokaw 1998), the World War II generation that knew sacrifice and challenge as perhaps no other in American history. Returning from battlefields of Europe and the Pacific, young men began or completed college educations. Women assumed new roles and status in the social and industrial life of America. These men and women started families and businesses; they returned to farms; they became government workers, community leaders, and politicians. They had higher educations, greater personal incomes, more leisure time, and greater mobility than previous generations. And they had youthful memories and outdoor savvy from hunting, fishing, camping, and touring in America's great outdoors that served them well in pitched combat overseas (Ambrose 1998). In the 1950s, they journeyed on America's roads in automobiles as no generation had ventured before. They introduced

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

their families to the nation's forests, parks, and fish and wildlife resources (Outdoor Recreation Resources Review Commission 1962). Their outdoor ethic moved these Americans to craft the fish and wildlife restoration programs of the 1950s and 1960s. These citizens, community leaders, and public servants promoted the federal laws that now protect the nation's water, air, land, and wildlife in ways that now some seem to find so troublesome.

Irresponsible environmental extremists? Hardly. We hope we measure up in some small way to their inspiring example.

The saga of *How the West Was Won* ended having portrayed a Missouri River harnessed for transportation, commerce, and for its bounty of fish and wildlife--a river of many uses.

How shall the Missouri River of the 21st Century be a river of many uses?

The answers impact a complex web of real or perceived entitlements. The National Academy of Science (National Research Council 2002) detailed the authorizations, orders, and regulations that have arisen around the Missouri River project.

Polar claims are predictably extreme. Proponents of absolutely no change intone the words Pick-Sloan, almost as if the engineers' very names should bring comfort and understanding to why the region has perfectly benefited from the river's engineering. Change zealots declare the project failed and an anachronism, and exhort scrapping the bank stabilization project and navigation, and removing the dams.

Somewhere in between are upper basin stakeholders who expect consistent reservoir levels to support a growing outdoor recreation industry, reminding critics that their states' farmers and Native American populations were horribly displaced to build the reservoirs in the first place.

Somewhere in between are lower basin river-bottom agriculturalists who fret that the Missouri River not flow too high--but not too low, either. Missouri River navigation is the Congressionally approved use that water-worried Missouri officials embrace to force the COE to release water from the "federal" reservoirs. But officials insist that this water be metered by the CWCP so that Missouri navigation, agriculture, municipal utilities, and power companies remain cohesive.

Somewhere in between is a growing but silent Missouri citizenry rediscovering the outdoor recreation potential of Big Muddy, especially the generally infrequent summer sandbars and shallow water that attracted thousands of boaters, anglers, picnickers, campers, sight-seers, and beach-combers in the droughty years of the mid-1980s (Fleener 1990).

And finally, some kinds of fish and wildlife appear to be going away. Perhaps their numbers were few all along; or perhaps many. But we know they lived in a wide, unruly river that we

channelized and changed. And now some animals are formally classified as "endangered," and need help to survive.

How shall the 21st Century Missouri River be a river of many uses?

Few rationally propose returning the Missouri River to its unbridled state. The aquatic wilderness that Lewis and Clark explored during their historic voyage of discovery has been well chronicled (Ambrose 1996), and though wilderness has high appeal in the minds and souls of today's Americans (Nash 1967), the wild Missouri is gone in the dammed and channelized stretches.

And the infrastructure of agriculture and transportation occupy important places in the river bottom. Testimony affirmed this at public hearings on the Missouri Water Control Manual Review and Update during fall, 2001. Paraphrasing the common theme of agricultural interests in the river bottom, "Don't flood the bottoms in the spring, don't dry the bottoms in the summer, don't make my farm operation more expensive, don't make me the 'endangered species'." And the river bottoms' wrecked roads and rails during and after The Great Flood of '93 underscored the historic tie between flat lands and road beds.

More recently, serious questions over the Master Manual have focused on several species now formally classified endangered or threatened. In 2000, the U.S. Fish and Wildlife Service, with authority for the Endangered Species Act (ESA), engaged COE in a "Section 7" consultation to determine the nature and extent of threats posed to the endangered and threatened species by the current Master Manual (USFWS 2000).

Emerging from this federal agency consultation was the RDEIS. In addition to the CWCP, five alternatives were analyzed and advanced for consideration. Four alternatives featured flow changes at Gavins Point Dam (Yankton, South Dakota), the last dam in the Missouri River reservoir system that would alter flows in Missouri.

In 2001, Governor Bob Holden requested a re-examination and objective analysis of many facets of Missouri's interests in the Master Manual, bringing together staff of five agencies within Missouri State government most affected by the proposed changes: Agriculture, MDC, Economic Development, Natural Resources (DNR), and Transportation. Discussions were facilitated by Mr. Caleb Weaver of the Governor's staff. The meetings were unique because the product was a consolidated letter signed by the five agency directors addressing key Master Manual issues.

Prior interactions of these staff were instructive but without consensus. So it was significant that the Directors of these five state agencies should advise Governor Holden in a jointly-signed letter of October 23, 2001 (see Appendix A):

> "We recognize that because of man-made changes to the Missouri River over the course of the last century, there has been a marked reduction in the quantity and quality of riverine habitat on the Missouri, resulting in declines in associated fish and wildlife habitats and populations. We are firmly committed to improving the environmental health of the Missouri River.
>
> ...We recognize that a properly timed and proportioned reduced late summer flow will likely benefit some sections of the River's ecosystem. We thus support efforts to achieve a flow level that will help these species, while also ensuring that the current long-term viability of river commerce on the Missouri River is not degraded."

In this spirit of commitment, this report analyzes a reduced summer flow on the Missouri River that represents an adaptive step in improving the environmental health of the Missouri River. Reemphasizing, the premise of this report is that the Missouri River has become, and must remain, a river of many uses, supporting commercial, recreational, and ecosystem values. However, we conclude that the Master Manual must be changed to help restore the river's natural diversity and achieve a finer balance among the Missouri River project purposes.

This reduced summer flow would constitute a water neutral re-balancing of the river system--that is, water held in the upper basin to provide the reduced flow would be released into the lower reach in fall, the very time Mississippi River navigators are needy of water (Figure 1, p.14)

Coincidentally, it appears that this reduced flow also supports the Congressionally authorized 9-foot deep, 300-foot wide navigation channel to north of St. Joseph, Missouri (river mile 476). Analysis continues to determine if the flow supports the Congressionally authorized channel to Sioux City, Iowa, the beginning of the navigation channel. This finding suggests that the long-quoted "navigation target flows" (Reservoir Control Center 2000) thought necessary to support "full-service" navigation at various reaches of the channel could be inaccurate, likely attributable to decades of channel-training and incision.

We would strongly caution that any reduced flow intended to produce fish and wildlife habitat benefits should be modeled and thoroughly documented throughout the channelized river before implementation (as is now possible, given time, with the geographic technology we are advancing). Not only is there a point at which reduced flow negatively impacts navigation, but there also may be an inflection or "bounce" point at which shallow water habitat gains from reduced flow are lost or reversed. This might occur if the scarce sand island/shallow water complexes interior to the high banks of the river are de-watered by reduced flow, with water retreating to the single, main channel. We are continuing to search for this possible lower inflection flow where fish and wildlife habitat benefits might actually diminish with reduced flows.

Methods

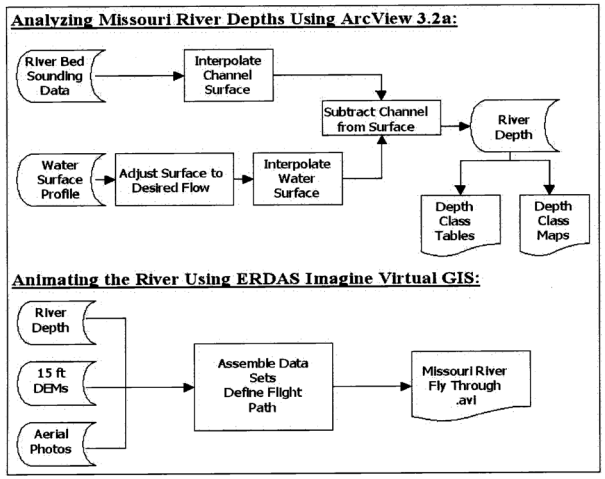
Missouri River depth sounding data compiled by COE (Kansas City COE 2001) were interpolated to create a 3-dimensional representation of the Missouri River bed (Figure 2a). In conjunction with water surface profiles also provided by the COE (A. Svoboda per. comm.), these data allow for estimation of depth at any given point in the river.

To estimate depths along the river at differing flow, the water surface profile was adjusted relative to the stage heights at each of the flow rates studied using stage-discharge relationships and gage data for August from the past 30 years, thus adjusting the height of the water surface at several points along the river. "August" as used in this report encompasses August and early September stages to account for the water travel time through the system. The result is a water surface elevation emulating the river at a given flow (e.g., ~41,000 cfs at KC). Comparison of the water surface data with the river bed data yields depth estimates. Water depths were estimated and compared for two flows (the median CWCP flow of 57,200 cfs and the proposed 41,000 cfs at KC) for 476 miles of the lower river within the following four reaches: St. Joseph (110 miles), Kansas City (169 miles), Boonville (99 miles), and Hermann (98 miles).

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

Depth data were analyzed using a variety of descriptive statistics, principally frequency analyses and rates (e.g., acres of shallow water habitat/river mile). Software produced by Environmental Systems Research Institute, Inc. (ESRI) was used to produce maps and descriptive statistics, while software from ERDAS was used to develop virtual "fly-throughs" of the river surfaces.

Figure 2a. GIS methodologies used to produce depth classes and animations.



This analysis does not purport to satisfy the methodological requirements or rigor of a hydrologic analysis. Hydrologic analyses not only include bathymetry (water depth), but also substrate data, water velocity, and geomorphic changes (Jacobson et al. 2002). However, these detailed analyses commonly describe small river stretches--1, 2, or perhaps several miles--while the present depth analysis addresses roughly 476 miles of the channelized Missouri River from north of St. Joseph, Missouri to the mouth at St. Louis.

> "Given the size and complexity of the Missouri River ecosystem, it is not clear where the point of irreparable environmental change lies, or how close the Missouri River ecosystem might be to passing that point." (National Research Council, 2002, p.1).

This urgency demands that the analytic scale be pushed to the system-wide level with plausible, heuristic models as proposed here.

Results

Comparison of a reduced August flow of ~41,000 cfs at KC to the August flows under the CWCP revealed a near two-fold increase in the amount of shallow water habitat for river fish and other aquatic resources over the four river reaches studied (Table 2 and Figure 3). We noted from our model that, under the median flows of the CWCP, there were approximately 3.7 acres/mile of shallow water habitat less than 5 feet deep within the St. Joseph reach, 6.4 acres/mile within the Kansas City reach, 13.1 acres/mile within the Boonville reach, and 17.3 acres/mile within the Hermann reach of the lower Missouri River.

We noted from our model that with a flow of ~41,000 cfs, the amount of shallow water habitat increased to 9.8 acres/mile within the St. Joseph reach, 15.4 acres/mile within the Kansas City reach, 21.1 acres/mile within the Boonville reach, and 23.8 acres/mile within the Hermann reach. By reducing the median flows just 16,200 cfs during the late summer period, we estimate the lower Missouri River system gains approximately 3,617 acres of shallow water habitat over what is available with the CWCP. This represents a near two-fold increase in habitat for native fish, especially young river fishes.

Gains in shallow water habitat with a reduced flow of ~41,000 cfs increased as one moves upstream from the mouth of the river. In the Hermann and Boonville reaches, the reduced flows produced 38% and 61% gains in shallow water habitat, respectively, whereas the Kansas City and St. Joseph reaches experienced 140% and 165% gains in shallow water habitat, respectively. Because shallow water habitat in the St. Joseph and Kansas City reaches is particularly scarce, the reduced flow results in proportionately greater habitat gains in these reaches. However, absolute habitat availability is still greater in the Hermann and Boonville reaches.

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

Table 2. *Acres/mile of shallow water (< 5 ft deep), and very shallow water (< 1 ft deep) habitat at median, and low and high tributary inflows during August under the CWCP and at a target flow of 41 kcfs at Kansas City within four lower Missouri River reaches. These estimates are a product of the Missouri Department of Conservation's model that predicts amounts of within-channel habitats at different flows along 476 miles of the lower Missouri River.*

	Lower Missouri River Reaches Studied							
Acres/ mile of habitat	St. Joseph		Kansas City		Boonville		Hermann	
Median flows	CWCP	41kcfs	CWCP	41kcfs	CWCP	41kcfs	CWCP	41kcfs
Shallow water	3.7	9.8	6.4	15.4	13.1	21.1	17.3	23.8
Very shallow water	0.3	1.0	0.5	1.6	1.5	3.1	2.3	3.8
Low tributary flows								
Shallow water	9.4	12.3	16.3	16.0	22.2	23.5	24.9	27.0
Very shallow water	1.0	1.4	1.8	1.7	3.3	3.6	4.1	4.6
High tributary flows								
Shallow water	0.5	8.4	0.9	14.2	2.6	18.4	2.1	21.0
Very shallow water	0.05	0.9	0.1	1.5	0.3	2.6	0.2	3.2

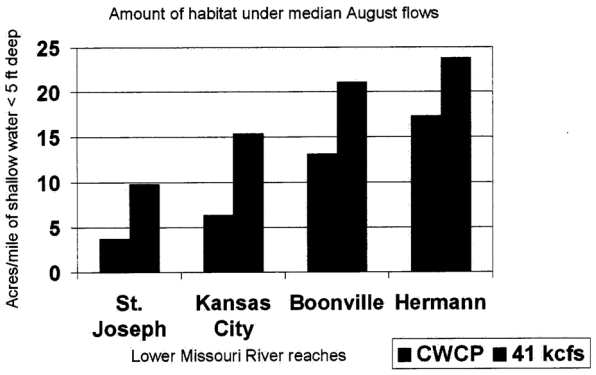


Figure 3. Acres/mile of shallow water habitat under median August flows of the CWCP and a ~41,000 cfs flow at Kansas City.

If we further break down this analysis and examine the amount of very shallow water habitat, (i.e., water that is less than 1 foot deep and perhaps even more valuable for small fishes in the river system), a reduced flow of ~41,000 cfs at KC also produces a two-fold increase in habitat over the CWCP. We note from our model that under the CWCP, there are 0.3 acres/mile of very shallow water within the St. Joseph reach, 0.5 acres/mile within the Kansas City reach, 1.5 acres/mile within the Boonville reach, and 2.3 acres/mile within the Hermann reach (Table 2 and Figure 4). With flows of ~41,000 cfs at KC, we noted 1.0 acres/mile of very shallow water habitat within the St. Joseph reach, 1.6 acres/mile within the Kansas City reach, 3.1 acres/mile within the Boonville reach, and 3.8 acres/mile within the Hermann reach. By reducing the late summer flows to ~41,000 cfs at KC, the lower Missouri River system gained about 552 acres of very shallow water habitat over that observed under the CWCP. This 2.1-fold increase in very shallow water habitat slightly exceeded the nearly two-fold increase observed for water less than 5 feet deep.

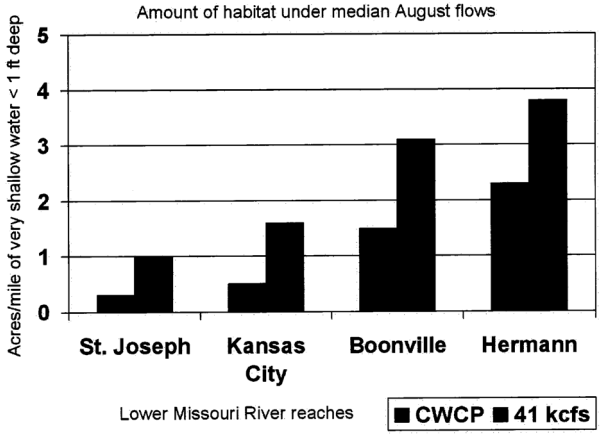


Figure 4. Acres/mile of very shallow water habitat under median August flows of the CWCP and a ~41,000 cfs at Kansas City.

Under a scenario of low tributary inflows, the amount of shallow and very shallow water habitat differs little between the CWCP and the ~ 41,000 cfs target flow at KC (Table 2 and Figure 5). Under a scenario of high tributary inflows, however, the gain in shallow and very shallow water habitat with a flow of ~41,000 cfs versus the CWCP is very dramatic. The gain in acres/river mile of shallow water habitat was up to 16 times greater with a flow of ~41,000 cfs (Table 2 and Figure 6). For instance, within the KC reach, our model projected that 0.9 acres/river mile of shallow water habitat would be available under the CWCP, while there were 14.2 acres/river mile available under a ~41,000 cfs flow at KC.

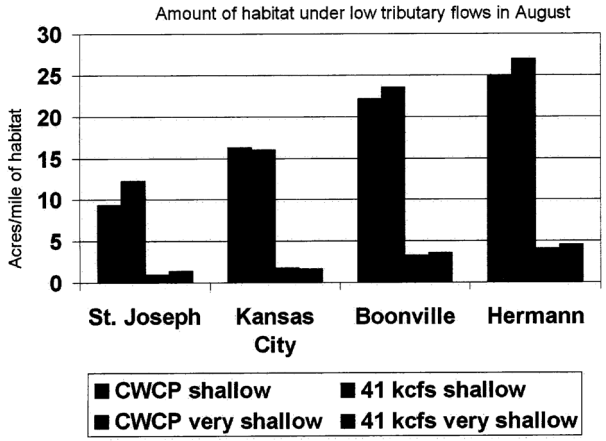


Figure 5. Acres/mile of shallow and very shallow water habitat under low tributary flows, in August, of the CWCP and a ~41,000 cfs at Kansas City.

We also observed differences in the amount of sandbar habitat available between the two August median flows. The sandbar acreage ranged from 0.7 to 4.7 acres/river mile under the CWCP (Table 3 and Figure 7). Under a ~41,000 cfs flow at KC, the sandbar acreage ranged from 2.2 to 12.7 acres/river mile. Thus, reducing the flow to ~41,000 cfs resulted in 2.5-fold increase or a gain of 1,951 acres of sandbar habitat across the four reaches of the lower Missouri River. Under low tributary inflows, the amount of exposed sand was similar between the CWCP and ~41,000 cfs at KC flow (Table 3). Under high tributary inflows, however, a ~41,000 cfs flow at KC provided on average an eight-fold increase in sandbar acreage over the CWCP (Table 3 and Figure 8).

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

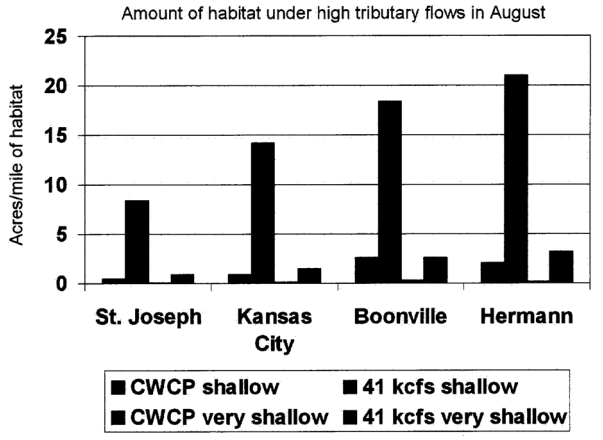


Figure 6. Acres/mile of shallow and very shallow water habitat under high tributary August flows of the CWCP and a ~41,000 cfs at Kansas City.

Table 3. *Acres/mile of sandbar habitat at median, and low and high tributary inflows during August under the Current Water Control Plan (CWCP) and at a target flow of ~41 kcfs at Kansas City within four lower Missouri River reaches. These estimates are a product of the Missouri Department of Conservation's model that predicts amounts of within-channel habitat at different flows along 476 miles of the lower Missouri River.*

	Lower Missouri River Reaches Studied							
Acres/mile	St. Joseph		Kansas City		Boonville		Hermann	
Median flows	CWCP	41kcfs	CWCP	41kcfs	CWCP	41kcfs	CWCP	41kcfs
Sandbar	0.7	2.2	1.6	4.1	4.3	9.8	4.7	12.7
Low tributary flows								
Sandbar	2.2	2.8	4.5	4.4	10.9	12.4	14.5	17.9
High tributary flows								
Sandbar	0.2	2.0	0.6	3.6	0.8	7.3	0.8	8.5

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

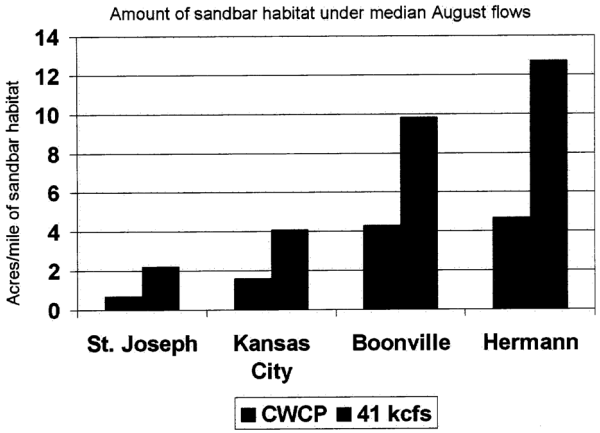


Figure 7. Acres/mile of sandbar habitat under median August flows of the CWCP and a ~41,000 cfs at Kansas City.

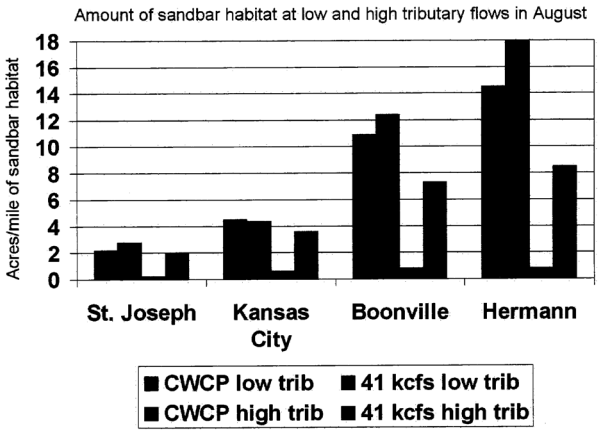


Figure 8. Acres/mile of sandbar habitat under low and high tributary flows, in August, of the CWCP and a ~41,000 cfs at Kansas City.

Discussion

As noted by a number of researchers (Hesse et al. 1988, Hesse et al. 1989, Hesse and Mestl 1993, Galat et al. 1997, Galat et al. 1998, Galat and Lipkin 1999), by the USFWS (2000), and most recently, by the National Research Council (2002), the fish and wildlife resources of the present Missouri River ecosystem would benefit from a change in flows, and specifically for the lower Missouri River, a reduction of summer flows from what is now observed under the CWCP.

In general, scientists propose reducing the summer flows with several goals in mind for the river's natural resources. First, reducing the late summer flow would more closely approximate the low-flow condition observed on the Missouri River prior to extensive development and modification. A restoration of some semblance of the natural hydrograph to the lower river would provide more of the pre-development environmental conditions to which our aquatic species are adapted.

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

Second, reducing late summer flows would provide more shallow water habitat within the river. It is expected that an increase in shallow water habitat at this time of year would increase the production and survival rates of native river fishes, especially young fish, which would benefit from an increase in feeding and refuge habitat.

We noted in our modeling work that a reduced late summer flow from the CWCP to about ~41,000 cfs at KC resulted in an estimated near two-fold increase in the amount of shallow water habitat within four reaches of the lower river. In its recent Missouri River Biological Opinion, the USFWS (2000) noted that prior to development and modification, the St. Joseph reach of the river averaged 100 acres/mile of shallow, <5 foot deep habitat during late summer. The USFWS further noted that only about 2% of this shallow water area still exists under the CWCP.

The USFWS (2000) suggests changing the management of the lower river to produce 20-30 acres/mile of shallow water habitat, a strategy combining the manipulation of summer flows, restoration of chutes, and widening the top of the channel. Our model suggests that a median August flow of ~41,000 cfs at KC approaches that goal within Missouri's portion of the river. With an ~41,000 cfs August flow at KC, our model predicted about 21.1 acres/mile of shallow water habitat in the Boonville reach and 23.8 acres/mile in the Hermann reach. This flow does not produce the recommended habitat levels in the St. Joseph and Kansas City reaches. However, the reduced flow brings these reaches to within about 10 acres/mile and 5 acres/mile, or to 48% and 77% of the goal, respectively, a substantial improvement over the CWCP.

Very shallow water habitats less than 1 foot deep are limited under the CWCP, particularly in the St. Joseph and Kansas City reaches (0.3 acres/mile and 0.5 acres/mile, respectively; Table 1). Based on modeling predictions, reducing summer flows to ~41,000 cfs at KC would triple this habitat type in these two reaches (1.0 acres/mile and 1.6 acres/mile, respectively; Table 1), and more than double very shallow water habitat from the mouth to near St. Joseph. Because of the importance of shallow, slow-velocity water habitats in large river ecosystems, particularly during spawning and nursery periods, it appears that a late summer flow of ~41,000 cfs at KC would enhance availability of these critical habitats and help restore vital components of the Missouri River ecosystem. In effect, reducing late summer flows doubles the chances these resources have of finding and using critical shallow water habitat.

Depth Class Maps

Bathymetric data were analyzed using ESRI software (ARCGIS) to produce 3-dimensional depth class maps. Figures 9, 10a, and 10b illustrate depths of the same river stretch at Hermann, Missouri at two KC flows, ~41,000 cfs and the CWCP. The software can not only produce map products, but can also be used as a tool to show river depth or point-to-point or shore-to-shore distance at any place on the computer image.

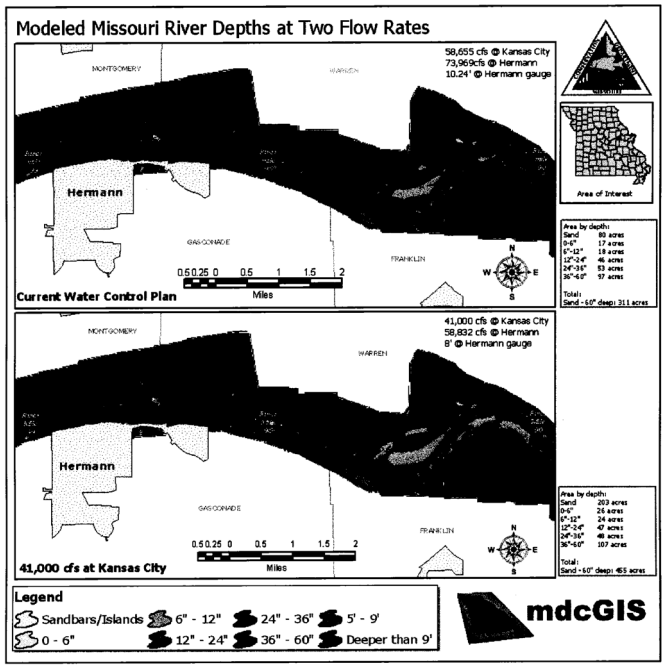


Figure 9. Modeled river depths at two flow rates during August near Hermann, Missouri.

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

Figure 10a. Captured image from computer animation displaying Missouri River near Hermann, Missouri with August CWCP flows.

Figure 10b. Captured image from computer animation displaying Missouri River near Hermann, Missouri with reduced August ~41,000 cfs flow at KC.

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

Depth maps graphically portray variability of exposed sand and shallow water, but also confirm the presence of the 9-foot deep, 300-foot wide navigation channel. Such maps should prove extremely useful for channel monitoring and maintenance from north of St. Joseph (river mile 476) to the mouth of the river at St. Louis. We plan to continue analyzing depth data for the river from mile 477 to Sioux City, Iowa (mile 734).

Virtual Fly-Throughs (.avi files)

Among the more promising and appealing applications of geographic computer software is the ability to merge aerial photography, bathymetric data, and ERDAS animation software to produce fly-throughs of the Missouri River at various flows. Appendix B contains compact disks (CDs) storing .avi files for the 4 stretches of river we analyzed, at two KC flows during August, ~41,000 cfs and the CWCP. Each file can be double-clicked, and the media-player common to most contemporary computers should automatically play the file.

Each CD file simulates a flight up the Missouri River along the selected stretch. Water depths are color-coded so that the viewer is aware of depth contrasts, as well as the presence of the navigation channel and surface features.

We strongly assert that visual, virtual, geographic, larger-scale river analyses such as these (patterned after the seminal example of Funk and Robinson [1974]) are absolutely essential to communication among resource and policy professionals and stakeholders on interstate water development issues. Unfortunately, these have been lacking from most Master Manual deliberations of the past decade. Computer-animated analyses provide the best and perhaps only method that ordinary people, informed laymen, and resource professionals can use to communicate on complex resource issues such as Missouri River management. Animated, heuristic demonstrations of river flows, such as those advanced here, should become the new standard for technical presentations at public meetings and workshops about the river.

"A good or service with no established market or known dollar value is no less valuable to society than a good or service with a market price."
Benefits of Stream Access Development (E.K. Brown, 1992, p.1)

ECONOMIC BENEFITS OF ENHANCED OUTDOOR RECREATION

The reduced late summer flow proposed in this report has benefits far beyond fish and wildlife habitat improvement. We refer to economic benefits which are among the most difficult to quantify. Goods or services with no established market or known dollar value (e.g., fishing, hunting, boating trips on the Missouri River) are no less valuable to society than a good or service with a market price (e.g., a barge shipment). The accepted standard of comparison in our society is monetary, and thus dollar values must be placed on goods and services not bought and sold in normal markets or with established prices, such as outdoor recreation (Brown 1992).

Karrenbrock (1988) estimated economic benefits of Missouri River recreation using travel cost methodology based on a 4-year recreation use survey (1983-87) of the river conducted by Fleener (1989); economic data were later re-analyzed and updated by Brown (1992). We updated Brown's economic estimates using the 2001 consumer price index (Bureau of Labor Statistics 2002).

Brown (1992) estimated average annual recreational trips at almost 429,000, with total annual expenditures of about $7.3 million (Table 4). An input-output analysis indicated that these expenditures generated additional business activity totaling about $14.4 million, and supporting 181 jobs. Moreover, the annual consumer surplus associated with Missouri River recreation--that is, the net or added value of the recreation not paid for by the user, as estimated by travel cost methodology--was $2,467,661. Simply, this $2.47 million can be described as a "gate-fee" or "turnstile" total that recreationists would have been willing to pay to participate in the recreational activities.

Table 4. Annual economic impacts (financial values) of recreationists' spending for trips to, on, and from the Missouri River (in Missouri, 2001 dollar values).

	Daily Expenditure	Av. Annual Trips	Total Expenditures	Business Generated	Jobs Supported	Sales Tax Generated	Income Tax Generated
Fishing	$19.91	149,040	$2,967,386	$5,829,483	73	$122,421	$ 70,483
Hunting	$15.04	17,720	$ 266,508	$ 523,348	7	$ 10,986	$ 6,326
Aesthetic-oriented	$15.71	261,830	$4,113,349	$8,081,413	101	$169,726	$ 97,712
TOTAL		**428,590**	**$7,347,243**	**$14,434,244**	**181**	**$303,133**	**$174,521**

Total annual economic impact in Missouri (expenditures plus additional business activity generated) of recreation on the Missouri River is estimated at $21.8 million (2001 dollars).

A speculative exercise, but one that begs effort nonetheless, places some dollar amount on the recreational impact that might be attributed to additional sand islands exposed at a reduced late summer flow. Anecdotal accounts indicate that sand islands are a preferred destination of many river recreationists.

Fleener (1989) noted that,

> "Estimated total recreational use of the 553 miles (derived from data [collected all 4 study years] at control sites) varied widely from year to year, and this variation appeared connected with water level. Total use was low the first year of the survey...when high water conditions prevailed from April through August, the peak recreation period. The following three years had more normal water levels and higher recreational use" (p. iii).

"Normal water level" referenced by Fleener was roughly (or somewhat above) the average CWCP in August. Our depth analysis revealed that the CWCP exposes about 252 miles of sand-island shoreline interior to the Missouri River channel, while the proposed ~41,000 cfs KC flow exposes 509 miles of shoreline.

A basic attempt can be made to estimate or index the economic impact of these *additional* sand islands (257 miles of shoreline) exposed by the proposed ~41,000 cfs KC flow. Take the 553 miles of river shoreline in Missouri, times 2 shores (equaling 1,106 shoreline miles), and add the 252 miles of sand-island shoreline exposed by CWCP, for a grand total of 1,358 shoreline miles. The annual economic impact of river recreation ($21.8 million) is divided by 1,358 shoreline miles to produce an index of $16,053 of economic impact/shoreline mile. Multiplying this index by 257 miles of additional shoreline produced by the ~41,000 cfs yields a speculative estimate of $4.1 million economic impact attributable to additional recreational activity linked to exposed islands.

Summarizing this exercise, and not to major on exact dollar amounts, we could reasonably speculate that several million dollars of additional recreational impact could be attributed to reduced late-summer flow. This added amount is not at all implausible when realizing that boats, motors, fishing and hunting equipment, gasoline, camping gear, and other purchases specifically for river recreation quickly add up. In any case, the hypothesis that additional economic impact can be attributed to newly exposed islands might be tested in a public use survey now being planned for the Missouri River in Missouri beginning 2002. The study would be a joint effort of MDC, DNR, and other partners (D. Zekor, MDC, per. comm.).

In recent years, the economics of Missouri River recreation and economics of commercial uses such as navigation have occasionally been pitted against each other, as if to prove that one is more important. In the case of Missouri's state interests, these two impacts are more effectively added together to legitimately portray the economic impact of a Missouri River of many uses. For example, the annual economic impact of river recreation of $21.8 million, adjusted by the speculative ~$4 million of added recreational value from a ~41,000 cfs KC reduced flow, yields a sub-total of $25.8 million. Add the economic impact of just one commercial use--navigation to, from, and within Missouri at $38.6 million (www.marc2000, "Economics: Missouri 1999 waterborne commerce to, from, and within the state")--and this yields a total economic impact of $64.4 million, a compelling economic argument against depletions of Missouri River water anywhere in the system.

As Fleener (1990) noted in introductory remarks to his recreational use study:

> "...a number of proposals have been introduced to remove large amounts of water from the Missouri River before it reaches Missouri, primarily for irrigation of western land. ...Needless to say, these plans have alarmed the Missouri Department of Conservation and others interested in the natural values of the river" (pp. 1-2).

Fleener's caution echoes concerns over threatened depletions of Missouri River water fully articulated by Missouri state officials charged to protect Missouri water (Vineyard 1997; Bacon and Drew 2001; Garstang and Bryan 2001). The most potent argument for protecting in-stream flow of water to Missouri is rallying the combined economic impacts of recreation, navigation, municipal water supply, power plant operation--and all these project purposes dependent on in-stream flow to Missouri--a Missouri River of many uses.

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

STURGEON MONITORING PROGRAM

Shovelnose sturgeon, *Scaphirhynchus platorynchus*, pallid sturgeon, and lake sturgeon, *Acipenser fulvescens*, are native to the Missouri and Mississippi River basins (Lee et al. 1980). All three species are adapted to large river systems that offer a diversity of habitat (Haywood 1999). However, decline in habitat availability and quality through dam construction, channelization, dredging, sedimentation, and snag removal, as well as commercial over-exploitation and pollution have negatively impacted these species.

The pallid sturgeon was not recognized as a species until 1905 (Forbes and Richardson 1905). Pallid sturgeon were rare in the Mississippi River above the mouth of the Missouri River, now believed to be the historic upper range of the fish in the Mississippi River (Forbes and Richardson 1905, Pflieger 1997). There, the ratio of pallid to shovelnose sturgeon was 1 in 500 (0.2%) of river sturgeons captured. However, they were much more common in the lower Missouri River, where it comprised one-fifth (20%) of river sturgeons captured.

Bailey and Cross (1954) provided information on relative abundance of pallid sturgeon prior to complete alteration of the Missouri River system for flood control and navigation. They found that pallid sturgeon comprised 5% of the sturgeon population in the Kansas River near Lawrence, Kansas, and 8% of the sturgeon population in the Missouri River in South Dakota. These early studies indicate that pallid sturgeon were a fairly common component of "river sturgeon" populations within these river systems.

However, studies conducted since completion of reservoirs in the Dakotas indicate a dramatic decline in pallid sturgeon abundances. Carlson and Pflieger (1981) collected 1 pallid sturgeon for every 398 sturgeon (0.3%) in the lower Missouri and Mississippi Rivers. Grady et al. (2000) noted further declines in pallid sturgeon relative abundances in the late 1990's. They found only 1 wild pallid sturgeon for every 647 sturgeon collected (0.15%) during their study on the Missouri and Mississippi Rivers. Other studies have also shown the rarity of pallid sturgeon in the Missouri River, and the ratio of pallid sturgeon to shovelnose sturgeon never exceeded 0.5% in any of these studies (Gould and Schmulbach 1973; Kallemeyn and Novotny 1977; Moos 1978).

In addition to a noted reduction in numbers, pallid sturgeon have been eliminated from nearly 48% of their historic range within the Mississippi River basin (Graham and Rasmussen 1999). Hesse and Carriero (1997) reported that lake sturgeon have been eliminated from 29% of their historic range in the United States, but the number of fish present in Missouri has undergone a more drastic decline than pallid sturgeon over the last 100 years (Graham 1992). The pallid sturgeon was federally listed as an endangered species in 1990, and the lake sturgeon was listed in Missouri as endangered in 1974.
Shovelnose sturgeon are the most widely distributed of the three species (Lee et al. 1980), and they are still considered common in most of the Mississippi basin's large rivers. However, their range has diminished in the last 100 years, and population numbers have been

reduced 25% throughout most of their range (Bailey and Cross 1954; Keenlyne 1997; Hesse and Carriero 1997). Only the shovelnose sturgeon supports legal commercial harvest. Harvest of shovelnose sturgeon has increased substantially over the past 10-15 years and appears to be driven by high egg prices (Graham and Rasmussen 1999). While commercial harvest of shovelnose sturgeon is still legal, there is concern about future over-exploitation of this species due to the recent collapse of Caspian Sea sturgeon populations that historically supplied eggs for most of the world's caviar market. Due to this concern, shovelnose sturgeon have been listed as a species of concern by the USFWS.

The primary objective of this program is to monitor population trends and determine status of the three sturgeon species from the Mississippi and Missouri rivers. This will assist MDC in the recovery of two endangered species (pallid and lake sturgeon) and aid in conserving shovelnose sturgeon populations in Missouri. Previously, there was no coordinated effort to monitor sturgeon populations within the State of Missouri. This project began in 2002 and establishes a ten-year standardized program to monitor changes in size distribution and abundance of the three sturgeon species in the Missouri and Mississippi rivers. This program is especially needed to monitor success of stocking programs (i.e., percent contribution to populations, year-class strength, etc.) of lake and pallid sturgeon, and to gain reliable baseline information to monitor future effects of changes in river flow regimes and riverine habitat modification/restoration projects aimed at benefiting lake and pallid sturgeon. The monitoring program will also assist in determining declines in shovelnose sturgeon size structure and abundance related to expected increases in commercial harvest. Those participating in this study will follow the sampling guidelines established by the Pallid Sturgeon Recovery Team (USFWS 2001). Fish movements (i.e., upstream or downstream movement and miles traveled between known tagging locations of individual fish and recapture location) will also be monitored, and differences in movement patterns among species or within species and among various size classes can be determined. These movement patterns will provide information on the scale that sturgeon species should be managed within the Missouri and Mississippi rivers (e.g., 50 mile section, 100 mile section, 500 mile section, entire basin, etc.).

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

ADAPTIVE MANAGEMENT IS FUNDAMENTAL

Adaptive management is a strategy for learning while doing (Decker et al. 2001). It's a complex process and controversial, but is being applied with success in resource settings across the world (Sweeney 1990; Decker et al. 2001; Light 2001; National Research Council 2002).

The traditional scientific method involves making a hypothesis, usually narrowly delimited in scope, and then designing an experiment that gathers evidence about the hypothesis, often for decades. But direct experiments like that do not work for complex resource issues, such as major water development projects that extend over many states, involve many types of natural resources, impact many stakeholders, and where time and action (urgency) are critical.

Adaptive management suggests that it is possible to make and implement a decision that resembles an experiment that can improve the situation. The steps of adaptive management are (1) identifying policy options, (2) making an heuristic model of the issue, (3) designing responses, (4) monitoring performance, and (5) based on performance, adapting policy options, then adjusting the model, designing responses, monitoring, and so forth through the steps (Decker et al. 2001).

At its best, adaptive management assumes the quality of "community conservation," in which stakeholders experience an advantage in working together (Witter and Jahn 1998). No one stakeholder or entitled group will ever retain or lose "everything," but each stakeholder gets "something." Moreover, loss of benefits or entitlement by one or more stakeholders may warrant compensation. Continual pursuit of this "win-win" distribution balances social, economic, and environmental trade-offs. Community conservation has shown success in managing forests (Gray and Kusel 1998), ranges (Sawhill 1998), and watersheds (Williams et al. 1997, Light 2001).

The National Academy of Science (National Research Council 2002) emphasized the fundamental role of adaptive management in efforts to restore the Missouri River ecosystem:

> "The Master Manual is the key document for distributing the benefits of the river and its reservoir operations. However, the procedures in the Master Manual used to produce the current suite of benefits largely reflects social values from the mid-twentieth century. As a result, the Master Manual may not adequately be meeting contemporary social demands, which place a greater emphasis on ecosystem benefits, water- and nature-based recreational pursuits, preservation of endangered habitats and species, the enhancement and conservation of biodiversity, and maintenance of the river corridor's cultural heritage. The Corps of Engineers recognizes that the current operations regime needs to be adjusted, having worked toward a revision of the Master Manual since the late 1980s.

There is today widespread recognition that the regulation of large rivers by dams and reservoirs has often resulted in losses of valuable ecological services. Although the environmental impacts of dams often have not been economically justified, many of those impacts can be reversed. On the Missouri River, there is a distinct prospect that a reversal of tradeoffs that would favor ecosystem restoration may be justifiable solely on the grounds that it represents an economic improvement on current mainstem dam operations. This, however, is not to deny that there may be winners and losers in a new operations scheme who will need to be carefully considered and perhaps compensated" (National Research Council 2002, p.87).

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

CONCLUDING REMARKS

This nation has discovered that no water development project is perfect, or perfectly flawed, but rather a sobering balance of economic and environmental benefits, re-balanced over time by society's expectations. Missourians expect their public servants to secure economic vitality while protecting the natural resources that are so much a part of who we are as a state, region, and nation.

It's now time for a science-based and adaptive reduction in the artificially high late summer flows of the engineered, channelized Missouri River.

Missouri needs a Missouri River of many uses.

REFERENCES

Ambrose, S. E. 1996. Undaunted courage. Touchstone: New York, NY. 521 pp.

Ambrose, S. E. 1998. Americans at war. Berkley Publishing Group: New York, NY. 272 pp.

Bacon, R. R., and J. D. Drew. 2001. Assessing water depletion in the Missouri River basin. 5th Missouri River Natural Resources Conference, Great Falls, MT. Missouri Department of Natural Resources, Jefferson City, MO, 16 pp.

Bailey, R. M., and F. B. Cross. 1954. River sturgeons of the American genus *Scaphirhynchus*: characters, distribution, and synonymy. Papers of the Michigan Academy of Science, Arts, and Letters 39:169-208.

Barry, J. M. 1997. Rising tide: the great Mississippi flood of 1927 and how it changed America. Touchstone: New York, NY. 524 pp.

Beckett, D. C., C. R. Bingham, and L. G. Sanders. 1983. Benthic macroinvertebrates of selected habitats of the lower Mississippi River. Journal of Freshwater Ecology 2:247-261.

Bramblett, R. G., and R. G. White. 2001. Habitat use and movements of pallid and shovelnose sturgeon in the Yellowstone and Missouri Rivers in Montana and North Dakota. Transactions of the American Fisheries Society 130:1006-1025.

Brokaw, T. 1998. The greatest generation. Random House: New York, NY.

Brown, E.K. 1992. Benefits of stream access development. Sixth annual conference of state organization for boating access. Missouri Department of Conservation, Jefferson City, 21 pp.

Bureau of Labor Statistics. 2002. "Consumer Price Indexes." U.S. Department of Labor, www.bls.gov/cpi/.

Carlson, D. M., and W. L. Pflieger. 1981. Abundance and life history of the lake, pallid, and shovelnose sturgeons in Missouri. Final Report, Endangered Species Project SE-1-6, sturgeon studies in Missouri, Job 1. Missouri Department of Conservation, Jefferson City.

Decker, D. J., T. L. Brown, and W. F. Siemer. 2001. Human dimensions of wildlife management in North America. The Wildlife Society: Bethesda, MD. 447 pp.

Ferrell, J. 1996. Soundings. U.S. Army Corps of Engineers, U.S. Govt. Printing Office: Washington, D.C. 171 pp.

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

Fleener, G.G. 1989. Recreational use survey of the Missouri River in Missouri. D-J Project F-1-R-38, Study S-32, Missouri Department of Conservation, Jefferson City. 51pp.

Fleener, G.G. 1990. Enjoying the wide Missouri: the Missouri River recreation survey. Missouri Department of Conservation, Jefferson City. 13pp.

Forbes, S. A., and R. E. Richardson. 1905. On a new shovelnose sturgeon from the Mississippi River. Bulletin of the Illinois State Laboratory of Natural History 7:37-44.

Funk, J. L., and J. W. Robinson. 1974. Changes in the channel of the lower Missouri River and effects on fish and wildlife. Aquatic series No. 11. Missouri Department of Conservation: Jefferson City, MO. 52 pp.

Galat, D.L., J.F. Kubisiak, J.B. Hooker, and L.M. Sowa. 1997. Geomorphology, distribution and connectivity of lower Missouri River floodplain waterbodies scoured by the flood of 1993. Verhandlugen Internationale Vereinigung fur Theoretische und Angewandte Limnologie 26:869-878.

Galat, D.L., L.H. Fredrickson, D.D. Humburg, K.J. Bataille, J.R. Bodie, J. Dohrenwend, G.T. Gelwicks, J.E. Havel, D.L. Helmers, J.B. Hooker, J.R. Jones, M.F. Knowlton, J.Kubisiak, J. Mazourek, A.C. McColpin, R.B. Renken, and R.D. Semlitsch. 1998. Flooding to restore connectivity of regulated large-river wetlands. Bioscience 48:721-733

Galat, D. L., and R. Lipkin. 1999. Characterizing the natural flow regime of the Missouri river using historical variability in hydrology. University of Missouri: Columbia, MO. 81+ pp.

Garstang, M., and B. Bryan. 2001. Presentation by Missouri Department of Natural Resources and Missouri Attorney General to Missouri Conservation Commission on possible Missouri River water depletions, September 28. Missouri Department of Conservation, Jefferson City.

Gould, G., and J. Schmulbach. 1973. Missouri River environmental inventory, relative abundance and distribution of fishes in the Missouri River, Gavins Point Dam to Rulo, Nebraska 1972-1973. Final Report, U.S. Army Corps of Engineers, Omaha District, Omaha, Nebraska.

Grady, J., J. Milligan, C. Gemming, D. Herzog, G. Mestl, L. Miller, D. Hernig, K. Hurley, P. Wills, and R. Sheehan. 2000. Pallid and shovelnose sturgeon in the lower Missouri and Middle Mississippi Rivers. Final Report to MICRA.

Graham, K. 1992. A plan for recovery of the lake sturgeon in Missouri. Missouri Department of Conservation, Jefferson City.

Graham, L. K., and J. L. Rasmussen. 1999. A MICRA perspective on closing paddlefish and sturgeon fisheries. Pages 130-142 *in* D. F. Williamson, G. W. Benz, and C. M. Hoover, editors. Proceedings of the symposium on the harvest, trade and conservation of North American paddlefish and sturgeon. TRAFFIC North America/World Wildlife Fund, Washington, D.C.

Gray, G., and J. Kusel. 1998. Changing the rules. American Forestry 103(4):27-30.

Haywood, M. 1999. Sturgeon and paddlefish and their current conservation status. Pages 8-21 *in* D. F. Williamson, G. W. Benz, and C. M. Hoover, editors. Proceedings of the symposium on the harvest, trade and conservation of North American paddlefish and sturgeon. TRAFFIC North America/World Wildlife Fund. Washington, D.C.

Hesse, L. W., and J. R. Carreiro. 1997. The status of paddlefish, pallid sturgeon, lake sturgeon, and shovelnose sturgeon. Mississippi Interstate Cooperative Resource Association. Bettendorf, Iowa.

Hesse, L. W., and G. E. Mestl. 1993. An alternative hydrograph for the Missouri River based on the precontrol condition. North American Journal of Fisheries Management 13:360-366.

Hesse, L. W., C. W. Wolfe, and N. K. Cole. 1988. Some aspects of energy flow in the Missouri River ecosystem and a rational for recovery. In: Benson, N. G. (ed.): The Missouri River: the resources, their uses and values. Pp. 13 – 29, North Central Division, American Fisheries Society, Special Publication 8.

Hesse, L.W., J.C. Schmulbach, J.M. Carr, K.D. Keenlyne, D.G. Unkenholz, J.W. Robinson, and G.E. Mestl. 1989. Missouri River fishery resources in relation to past, present, and future stresses. Canadian Special Publication of Fisheries and Aquatic Sciences 106:352-371.

Jacobson, R. B., M. S. Laustrup, and J. M. Reuter. 2002. Habitat assessment, Missouri River at Hermann, Missouri. U.S. Department of the Interior, U.S. Geological Survey, Open-File Report OF 02-32. 22 pp.

Kallemeyn, L. W., and J. F. Novotny. 1977. Fish and fish food organisms in various habitats of the Missouri River in South Dakota, Nebraska, and Iowa. U.S. Fish and Wildlife Service, Biological Report FWS/OBS-77/25.

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

Kansas City COE. 2001. Preliminary elevation data for Missouri River floodplain. Unpublished.

Karrenbrock, J. D. 1988. Economic valuation of recreational activity on the Missouri River: simplified travel cost models. Publ. Profile 4-88, Missouri Department of Conservation, Jefferson City. 22pp.

Keefe, J.F. 1987. The first 50 years. Missouri Department of Conservation, Jefferson City. 446 pp.

Keenlyne, K. D. 1997. Life history and status of the shovelnose sturgeon *Scaphirhynchus platorynchus*. Environmental Biology of Fishes 48:291-298.

Kubisiak, J. F. 1997. Small fishes in lower Missouri River scoured basins: the influence of connectivity. M.S. Thesis, University of Missouri, Columbia.

Lee, S. A., C. R. Gilbert, C. H. Hocutt, R. E. Jenkins, D. E. McAllister, and J. R. Stauffer. 1980. Atlas of North American freshwater fishes. North Carolina State Museum of Natural History. Raleigh, North Carolina.

Light, S.S. 2001. Adaptive ecosystem assessment and management: the path of last resort. Unpublished manuscript, 12 pp..

Missouri Department of Conservation, 2000. Missouri's 2000 Conservation Monitor survey: the Gallup Report. Missouri Department of Conservation Public Profile 2-2000, Missouri Department of Conservation, Jefferson City. 63 pp.

Moos, R. E. 1978. Movement and reproduction of shovelnose sturgeon *Scaphirhynchus platorynchus* (Rafinesque), in the Missouri River, South Dakota. Ph.D. Dissertation, University of South Dakota, Vermillion.

Nash, R. 1967. Wilderness and the American mind. Yale University Press: New Haven, CT. 256 pp.

National Research Council. 2002. The Missouri river ecosystem: exploring the prospects for recovery. National Academy Press: Washington, D.C. 147.

Outdoor Recreation Resources Review Commission. 1962. Projections to the years 1976 and 2000: Economic Growth, population, labor force and leisure, and transportation. U.S. Government Printing Office, Washington, D.C. 434 pp.

Parsley, M. J., and L. G. Beckman. 1994. White sturgeon spawning and rearing habitat in the lower Columbia River. North American Journal of Fisheries Management 14:812:827.

Pflieger, W. L. 1997. The fishes of Missouri. Missouri Department of Conservation: Jefferson City. 372 pp.

Reservoir Control Center. 2000. Technical Report, 2000-A. Missouri River main steam reservoirs: releases needed to support navigation. U.S. Army Corps of Engineers, Northwest Division-Missouri River Region. 12 pp.

SAST (Scientific Assessment and Strategy Team). 1994. Science for floodplain management into the 21st century in Interagency Floodplain Management Review Committee: a blueprint for change: Part V. U.S. Government Printing Office, Washington, D.C. 272 pp.

Sawhill, J.C. 1998. The good-neighbor policy. Nature Conservancy 48(1):5-11.

Schneiders, R. K. 1999. Unruly river. University Press of Kansas: Lawrence, KS. 314 pp.

Sweeney, J. M. (ed.). 1990. Management of dynamic ecosystems. The North Central Section of The Wildlife Society: West Lafayette, IN. 180 pp.

Thorp, J. H. 1992. Linkage between islands and benthos in the Ohio River, with implications for riverine management. Canadian Journal of Fisheries and Aquatic Sciences 49:1873-1882.

Tibbs, J. E. 1995. Habitat use by small fishes in the lower Mississippi River related to foraging by least terns (*Sterna antillarum*). M.S. Thesis, University of Missouri, Columbia.

Tibbs, J. E. and D. L. Galat. 1997. Larval, juvenile, and adult small fish use of scour basins connected to the lower Missouri River. Final Report. U.S. Geological Survey, Missouri Cooperative Fish and Wildlife Research Unit, Columbia, Missouri.

U. S. Army Corps of Engineers. 2001. Revised draft environmental impact statement, Volume 1, main report, master water control manual, Missouri river, U.S. Army Corps of Engineers, Northwestern Division: Portland, OR. 12 chapters.

U. S. Fish and Wildlife Service. 2000. Biological opinion on the operation of the Missouri River main stem reservoir system, operation and maintenance of the Missouri River bank stabilization and navigation project, and operation of the Kansas reservoir system. Final Report. USFWS, Region 6, Denver, Colorado and Region 3, Fort Snelling, Minnesota.

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

U. S. Fish and Wildlife Service. 2001. Biological procedures and protocol for collecting, tagging, sampling, holding, culture, transporting, and data recording for researchers and managers handling pallid sturgeon. Pallid Sturgeon Recovery Team. USFWS, Bismark, North Dakota.

Vineyard, J. D. 1997. Water resource sharing: the realities of interstate rivers. Missouri state water plan series volume VI. Missouri Department of Natural Resources, Jefferson City. 76 pp.

Webb, P. W. 1975. Hydrodynamics and energetics of fish propulsion. Bulletin of the Fisheries Research Board of Canada 190:1-158.

Williams, J.E., C.A. Wood, and M.P. Dombeck. 1997. Watershed restoration: principles and practices. American Fisheries Society, Bethesda, MD. 561pp.

Witter, D.J. and L. R. Jahn. 1998. Emergence of human dimensions in wildlife management. Transactions of the 63rd North American Wildlife Natural Resources Conference 63:200-214.

APPENDIX A

October 23, 2001

RECEIVED
NOV - 1 2001
POLICY COORDINATION

The Honorable Bob Holden
Governor of Missouri
State Capitol, Room 216
Jefferson City, MO 65101

Dear Governor Holden:

We are the directors of the agencies within Missouri State government that are most affected by the proposed changes to the Missouri River Master Manual. Collectively, we oversee the departments charged with serving the agricultural community, our transportation system, development of Missouri's economy, and stewardship of fish, wildlife, and other natural resources. We recognize that because of man-made changes to the Missouri River over the course of the last century, there has been a marked reduction in the quantity and quality of riverine habitat on the Missouri, resulting in declines in associated fish and wildlife habitats and populations. We are firmly committed to improving the environmental health of the Missouri River.

Our agencies have not yet evaluated all of the newest data released by the U.S. Army Corps of Engineers (Corps) because of the long delay in the release of the entire Revised Draft Environmental Impact Statement (RDEIS), and we have expressed our desire to have the time to do so prior to taking any official stand. However, because we are already nearly two months into the official period for public comment, we feel that it is extremely important to advise you on the core issues under discussion so you can effectively represent Missourians in the larger debate currently underway.

As we evaluate the newest data from the Corps, we will be looking to ensure that the Missouri River remains a "river of many uses," including recreation, navigation, agriculture, hydropower, water supply, and fish and wildlife conservation. These issues are of vital importance to the future of our state and to the nation as a whole. We thus believe that all decisions must be based on sound science. We strongly believe that if all sides of this discussion commit themselves to adherence to solutions founded on valid scientific studies, we will be able to make substantial progress on resolving the issues that have been debated for so many years.

A significant concern is that proposals to increase total system storage in the upper lakes would significantly reduce the ability of the Corps to ensure that the River is managed to the benefit of all residents of the basin. The Corps must have adequate flexibility to respond to a wide variety of situations, both anticipated and unforeseen. We believe these proposed changes to storage levels in the upper lakes would limit the Corps' capacity to perform its statutorily mandated role. We are further concerned that these changes could eventually restrict the use of water by downstream states and thus be detrimental to the future welfare of Missourians.

Furthermore, in light of the importance of the endangered species in this discussion, we also suggest that the effects of increased storage of water in the upper lakes on the endangered species

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

be examined. Comprehensive data regarding the impact of higher levels in the upper lakes on the endangered species is not currently available, and we believe this information should be included in this dialogue.

A second key component of many of the current proposals is for a variety of reduced flows from Gavins Point Dam in the summer. We recognize that a properly timed and proportioned reduced late summer flow will likely benefit some sections of the River's ecosystem. We thus support efforts to achieve a flow level that will help these species, while also ensuring that the current long-term viability of river commerce on the Missouri River is not degraded. During the past couple of years, our agencies have advocated a reduced flow of 41,000 cfs at Kansas City from August 1 through September 15. The goal of this proposal, which would occur approximately three of every five years, is to balance the interests of the endangered species, recreation, and the continued support of other uses of the Missouri River. This proposal received a partial analysis as a "submitted alternative" in the RDEIS (called submitted alternative "Missouri Department of Conservation," or "MODC"; see for example chapter 5, "Effects of Alternative Submitted to the Corps for Consideration").

Proposals to depart from current operations must also consider the effects of any changes on Mississippi River system navigation. We do not support proposals that are detrimental to the long-term viability of navigation on either the Missouri River or the Mississippi River. Finally, any reduced summer flow alterations must be water neutral. We cannot support proposals that reduce the amount of useable water released to downstream states.

A third key component of the current proposals is a periodic spring rise, created by federal releases of additional water from Gavins Point Dam during May. The lower stretches of the Missouri River, including the entire 553 miles in Missouri, already receive a natural spring rise from tributary inflow. Thus, such a change would have little impact on the riverine species living in the stretch of the river within or bordering on the state of Missouri.

We further believe that the effects of such a spring rise on Missouri's agricultural community must be a top priority in this discussion. We have serious concerns that the current proposals for expanded spring releases could have adverse effects for the bottomland farmer in Missouri, including an increased degree of breached levees, flooding, higher groundwater levels and inadequate drainage throughout the lower basin. The dangers of such a spring rise are increased because water from Gavins Point Dam takes approximately 10 days to reach St. Louis. Additional spring releases could potentially compound the effects of large rainfall events downstream of Gavins Point, thereby increasing the risk of unanticipated flow levels in downstream states. We believe that the agricultural community along the Missouri River must remain viable and profitable in the twenty-first century.

Another component of many of the proposals is unbalancing the upstream reservoirs -- an idea that has been under discussion for some time. Unfortunately, this idea has often been linked to

The Honorable Bob Holden
October 23, 2001
Page 3 of 3

higher reservoir levels. We believe that these should remain two separate issues. We generally support plans to unbalance the reservoirs, as long as such changes do not increase total system storage or diminish the amount of useable water for downstream states.

One issue that has occasionally been lost because of the more contentious nature of some of the other proposals is the importance of habitat improvement projects in restoring the aquatic diversity lost to the creation of the upstream lakes, and channelization and bank stabilization efforts over the last fifty years. We believe that an active program of habitat creation and restoration, augmented by appropriate flow changes, would substantially assist the recovery of the endangered species. Our state has undertaken a number of habitat improvement projects, often in concert with the Corps, and we believe that these cost-effective and uncontroversial efforts deserve significant investment by the federal government.

Finally, one issue of high importance to our state, which is not currently in any proposals but has been raised at various times during this discussion, is the possibility of water transfers out of the Missouri River basin. We unequivocally oppose out-of-basin transfers. Out-of-basin transfer of water decreases the amount of water available in the Missouri River basin. Such transfers constitute economic and ecological threats given the existing demands for water within the basin and the needs of species dependent on the river for their survival.

In conclusion, we are all firmly committed to restoring and protecting the Missouri River. As the evaluation process of proposed changes continues, we reiterate the importance of basing all decisions on sound scientific data, and further urge that all of the potential impacts and opportunities to both the Missouri and Mississippi River systems for each component of every proposal be considered. Thank you for the opportunity to express our positions on these extremely important issues.

Sincerely,

Steve Mahfood, Director, Missouri Department of Natural Resources

Jerry Conley, Director, Missouri Department of Conservation

Lowell Mohler, Director, Missouri Department of Agriculture

Joe Driskill, Director, Missouri Department of Economic Development

Henry Hungerbeeler, Director, Missouri Department of Transportation

A Missouri River of Many Uses: Policy and Flow Analysis
Report to the Missouri Conservation Commission
February 25, 2002
WORKING DOCUMENT SUBMITTED TO COE

APPENDIX B

Animated computer files on CD-ROM displaying ~41,000 cfs at KC flow and CWCP flows at each of four reaches for Hermann, Boonville, Kansas City, and St. Joseph.

S0300006

STATE OF MISSOURI
Bob Holden, Governor • Stephen M. Mahfood, Director
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND LAND SURVEY
P.O. Box 250 111 Fairgrounds Rd. Rolla, MO 65402-0250
(573) 368-2100
FAX (573) 368-2111

November 21, 2001

Colonel David A. Fastabend
U.S. Army Corps of Engineers
Northwest Division
P. O. Box 2870
Portland, OR 97208-2870

Dear Colonel Fastabend:

I am writing to transmit for the record a corrected version of my written testimony presented at the New Orleans hearing on the RDEIS for the Missouri River Master Manual revision. The corrected copy properly reflects the Southern Governors' Association position regarding restrictions to "flow of the river during the summer and fall..." Due to an oversight, I did not have all of the attachments that were to go with the written testimony, so the corrected text also has the proper attachments with it.

Very truly yours,

DEPARTMENT OF NATURAL RESOURCES

Jerry D. Vineyard
Interstate Rivers Director

Attachments

c: Rose Hargrave

RECYCLED PAPER

TESTIMONY TO THE U.S. ARMY CORPS OF ENGINEERS ON THE MISSOURI RIVER MASTER MANUAL RDEIS
BY: JERRY VINEYARD
RIVER BASIN COORDINATOR
MISSOURI DEPARTMENT OF NATURAL RESOURCES
New Orleans

Good evening, my name is Jerry Vineyard. I am the Interstate River Basin Coordinator for the Missouri Department of Natural Resources. I represent the department on interstate water issues on both the Mississippi and Missouri Rivers. Thank you for the opportunity to speak, and thank you for holding a hearing in New Orleans where the full effects of flow management changes on the Missouri River will be felt.

Tonight, I am here to represent Missouri's concerns regarding operational changes proposed for the Missouri River and the resulting impacts to the Mississippi River and to respond to issues raised in previous public comment. The Missouri River flows into the Mississippi River immediately upstream of the second largest inland port in our nation – St. Louis. The stretch of the Mississippi River between St. Louis and Cairo, Illinois is often referred to as the "bottleneck reach". Located between the system of Locks and Dams and the Ohio River, low flow in this reach can act as a bottleneck to waterborne commerce on the inland waterway system. During periods of low flow in the Mississippi River, the Missouri River provides as much as two-thirds of the water to the "bottleneck reach" of the Mississippi supporting river commerce and other beneficial uses of the river.

Even though there is a direct link between these two great rivers, the effects of the changes to the management of the Missouri River on the Mississippi River have received surprisingly little attention in the Missouri River Master Manual discussion. Although the Corps of Engineers manages these two great rivers

Miss 1

independently, they must allow river users in both basins to fully understand how changes to Missouri River management may affect the reliability of both rivers.

As early as 1999, three Mississippi River governors submitted a joint letter to General Ballard, specifically requesting that incremental depletion modeling be performed and reviewed so that everyone may understand depletion impacts on Mississippi River commerce and Midwest agriculture. Then, earlier this year, the governors of eight Mississippi River states (Kentucky, Tennessee, Louisiana, Mississippi, Illinois, Arkansas, Wisconsin, and Minnesota) joined Missouri Governor Bob Holden in requesting that decisions on the operations on the Missouri River only be reached with the direct involvement of all the states that rely on the Inland Waterway System. They asked that the Corps offer briefings to all the Mississippi River states on the full effects of these proposals, including reasonably anticipated future depletions.

Miss 5

Other 127

The governors also requested that the Corps provide a reasonable anticipated depletion analyses on the entire Mississippi River system for all alternatives that are under consideration including the Fish and Wildlife Service's proposal found in the Biological Opinion. Further, the Corps was asked to not select its "Preferred Alternative" until these analyses and briefings had been completed and the states have been allowed time for meaningful review and input. At best, the failure on the part of the Corps to provide the incremental depletion analyses requested by 11 governors for the MCP alternative is a serious omission which must be corrected as soon as possible. The impacts to the Mississippi River economic and environmental values should be made available on the Internet so that all parties following the Master Manual revision process may have access to the information before the end of the comment period. Copies of these letters are attached to my testimony. I am also submitting for the record a copy of a strongly-worded

Miss 5

Miss 18

resolution issued by the Southern Governors Association opposing any flow management changes on the Missouri River that would reduce support for water-borne commerce on the Mississippi River, especially in the summer and fall.

Miss 4, 25

All new plans in the RDEIS retain more water in the Main Stem Reservoirs at the expense of flow support to the lower Missouri and Mississippi rivers. Large decreases in flow support occur when navigation is not supported on the Missouri River. Under the MCP alternative, large decreases in flow support occur 40 percent of the time (40 out of 100 years). Our analysis indicates that 75 percent of the time, these cutbacks in flow on the Missouri River coincide with low water on the Mississippi River (30 of the 40 years). In contrast, the Current Water Control Plan cuts back 9 percent of the time (9 out of 100 years), coinciding with low water on the Mississippi River about 78 percent of the time (7 of the 9 years). The Current Water Control Plan clearly has greater reliability for flow support to the Mississippi River than any of the other plans presented in the RDEIS.

Miss 19

We believe that plans must be evaluated under future water depletion conditions. The MCP plan has not been analyzed with future levels of depletions. If the Corps had analyzed MCP, we would expect that there would be an exponential increase in the magnitude and frequency of low water events on the Mississippi River. Consequently, we would also expect the economic impacts to grow exponentially. During the PRDEIS process the Corps analyzed future depletion scenarios for several plans. The C31 plan is possibly the closest plan to the MCP plan. Under C31 there are 4 years out of 100 where the entire ice-free period is at the greatly reduced flow levels. With 0.8 MAF of additional depletions, this rises to 7 out of 100 years and with 1.6 MAF of additional depletions, this rises to 8 out of 100 years. The plan really shows a dramatic change at the 3.2 MAF of additional depletions, where 25 out of the 100-year period has substantial flow cuts for the

Miss 20

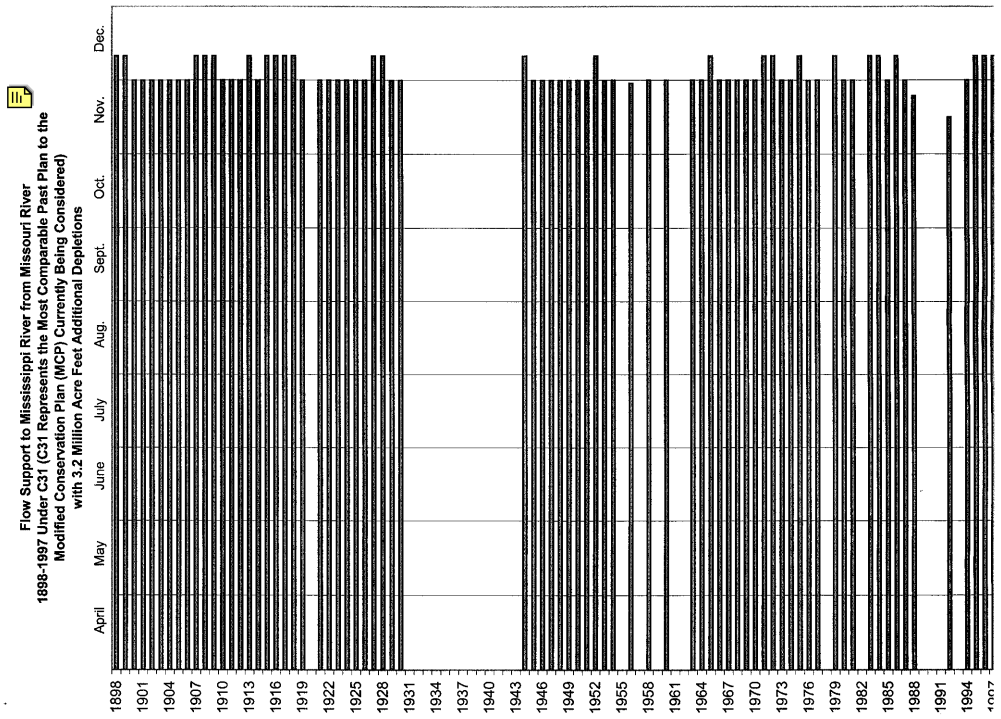
entire ice-free season (April to December). This compares to 8 out of 100 years under the Current Water Control Plan with 3.2 MAF of additional depletions. A graphical representation has been included for C31 and the Current Water Control Plan (CWCP) with future depletions added. The bars represent periods when substantially higher flow support is provided. This analysis compels us to call on the Corps to significantly scale back the higher reservoir levels that are embedded in all five of the new flow management alternatives in the RDEIS in order to avoid major negative impacts on Mississippi River navigation.

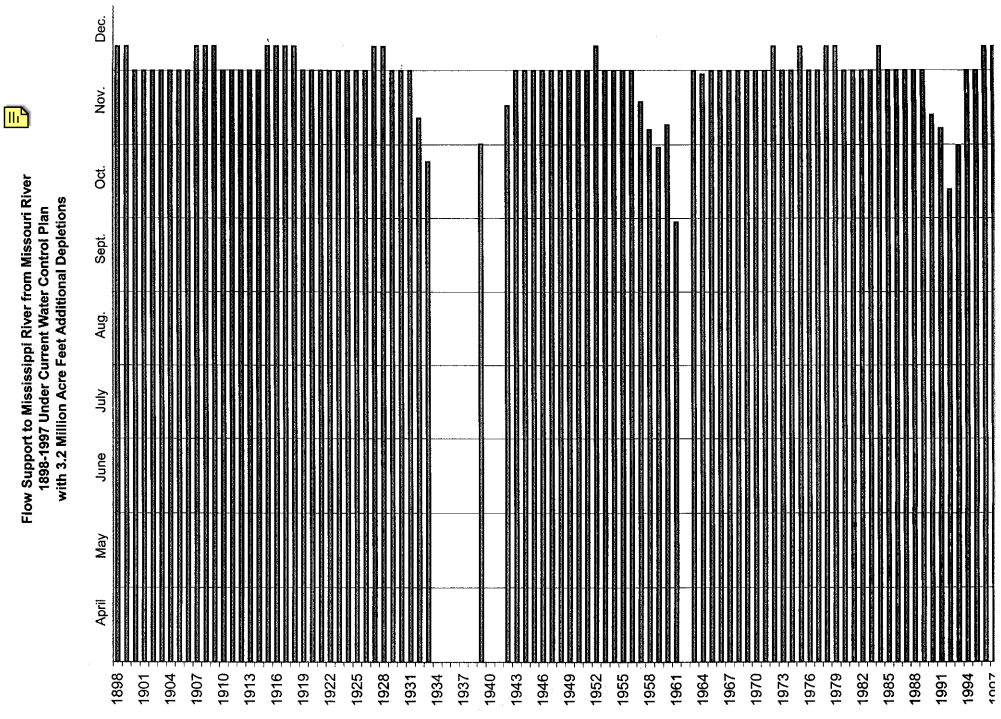
Because of the limited amount of time here tonight, I will not go into detail but wish to at least touch on several concerns.

1. First, the Mississippi River economic impacts displayed in the RDEIS are misleading. Sensitivity analysis performed by the Corps has shown that the results can be greatly affected by minor adjustments in the models. The results can also be dramatically changed with the exclusion of 1 year (1939). Therefore any conclusions from data presented should be carefully scrutinized prior to making any decisions or recommendations. Miss 21
2. Second, the RDEIS leads one to believe that all of the 5 new plans are better for water commerce on the Mississippi River, while at the same time indicating a need for increased dredging and changing the low water reference plane (something that should be studied in detail). This seems contradictory. Miss 22
3. Third, of the five new plans in the RDEIS, the Corps has only analyzed the impacts of future depletions on two of the new plans. These plans increase lost efficiency costs by about 10 fold over the Current Water Control Plan (about $10 million per MAF of additional depletion versus about $1 million). I am also submitting for the record a partial listing summarizing Indian water right claims asserted by the Mni-Sose Intertribal Water Rights Coalition, Inc. These claims have not been addressed, and therefore add further uncertainty to Missouri River flows. Miss 23 Tribal 8
4. Fourth, we believe that the new higher reservoir levels and resulting downstream flow restrictions would adversely impact water commerce on the Mississippi River. Last November is an example of where this would have been the case. Attached to my testimony is a chart showing the stage at St. Louis under current operations versus the MCP plan. Miss 24
5. Fifth, last night in Memphis testimony was given that most of the changes proposed in the MCP alternative were approved in a seven to one vote by the Missouri River Basin Association. However, it is important to point out that Mississippi River states were not welcome at the table, and therefore had no opportunity to vote. Had Illinois, Kentucky, Arkansas, Tennessee, Mississippi and Louisiana been given a vote, the result likely would have been seven to seven, with seven states representing about seven million people vs. seven states representing 35 million people. Other 127

Finally, we understand that three additional hearings have been proposed for Omaha, Quincy, and Cape Girardeau. We support additional hearings and suggest that they be scheduled for late in the comment period because it would allow time to include any new studies that the Corps might perform. Other 128

Thank you for the opportunity to comment.


Flow Support to Mississippi River from Missouri River
1898-1997 Under C31 (C31 Represents the Most Comparable Past Plan to the
Modified Conservation Plan (MCP) Currently Being Considered)
with 3.2 Million Acre Feet Additional Depletions
April
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
1898
1901
1904
1907
1910
1913
1916
1919
1922
1925
1928
1931
1934
1937
1940
1943
1946
1949
1952
1955
1958
1961
1964
1967
1970
1973
1976
1979
1982
1985
1988
1991
1994


Flow Support to Mississippi River from Missouri River
1898-1997 Under Current Water Control Plan
with 3.2 Million Acre Feet Additional Depletions
April
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
1898
1901
1904
1907
1910
1913
1916
1919
1922
1925
1928
1931
1934
1937
1940
1943
1946
1949
1952
1955
1958
1961
1964
1967
1970
1973
1976
1979
1982
1985
1988
1991
1994

STATE OF MISSOURI
WASHINGTON, D.C. OFFICE

MEL CARNAHAN
GOVERNOR

HALL OF THE STATES
400 NORTH CAPITOL ST., SUITE 376
WASHINGTON, D.C. 20001
(202) 624-7720

SUSAN HARRIS
DIRECTOR

May 28, 1999

Lt. General Joe N. Ballard
Chief of Engineering
U.S. Department of the Army
2600 Army Pentagon
Washington, D.C. 20103-2600

Dear General Ballard:

Our states continue to consider and evaluate the proposed Missouri River management alternatives as presented in the Preliminary Revised Draft Environmental Impact Statement (PRDEIS) of September 1998. As you are aware, the Missouri River exerts a vital influence on the health and prosperity of our states. Consequently, the information sharing partnership between the federal government and the states is critical to the success of revising the Missouri River Master Manual to benefit Missouri basin needs as well as the needs of Mississippi River states.

Workshops held by the Corps of Engineers (COE) have allowed for a better understanding of the Missouri River system and how proposed changes impact stakeholders. The COE has provided the basic modeling data for the various proposed river management alternatives that many impacted parties have been evaluating for more than six months. However, we have recently learned that some of the information presented in the PRDEIS by the COE was incorrect because of modeling inadequacies, modeling assumptions, or other problems.

Thanks to the COE staff, the problems are being corrected and new results are being generated. We understand that the new data will be shared, as it becomes available, and that the previously reported impacts will be different for some of the alternatives. Unfortunately, it is extremely late in the process to be confronted with amended information. In order for the states to have a chance at consensus, we need more time.

In light of the new data that is being generated, much of which we have not yet seen, we need sufficient time to examine the new results and understand their implications. We are therefore requesting a 90-day extension in the informal review period for reviewing the data and identifying a solution. This time extension would also allow the previously requested incremented depletion

modeling to be completed and reviewed so that everyone may understand depletion impacts particularly in regard to Mississippi River commerce and Midwest agriculture.

We realize that upstream and downstream interests are working together with the COE toward a solution and we want to encourage this cooperation. This 90-day extension would allow the citizens of our states until August 31, 1999, to review the new and revised models and propose a preferred alternative. We strongly encourage your favorable consideration of this request. Thank you for your attention to this important matter.

Sincerely,

Mel Carnahan
Governor
State of Missouri

Thomas J. Vilsack
Governor
State of Iowa

George Ryan
Governor
State of Illinois

March 22, 2001

The President
The White House
Washington, D.C. 20500

Dear Mr. President:

As governors of states along the Mississippi River, we are writing to express our concern about management changes proposed for the Missouri River. Major changes are being considered without documentation of their full effects or input from the impacted states outside the Missouri River Basin. The Missouri River flows into the Mississippi River immediately upstream of the second largest inland port in our nation – St. Louis. The stretch of the Mississippi River between St. Louis, Missouri and Cairo, Illinois is often referred to as the "bottleneck reach" because of the need for flow support to provide for transportation needs. During periods of low flow in the Mississippi River, the Missouri River provides as much as two-thirds of the water to the "bottleneck reach" of the Mississippi River supporting navigation and other beneficial uses of the river.

The U.S. Army Corps of Engineers is preparing a new plan for the operations of the Missouri River. The proposals under serious consideration include higher reservoir levels that would actually decrease flexibility in managing this complex system for flood control and other project purposes. The Corps' Northwest Division's "Preferred Alternative" would shorten the navigation season on the Missouri River by 27 days and reduce the reliability of navigation on the Mississippi River during a critical period in the late fall. An analysis of the last 100 years of records shows that, under this alternative, fall cutbacks would have occurred in 35 out of 100 years. This is over four times more often than under the current water management plan. In addition, six years would have had no navigation season compared with one under the current plan. Had this proposal been in effect during the year 2000, water levels at St. Louis and in the "bottleneck reach" of the Mississippi River would have been two to three feet lower for a period of 27 days in November. The other proposals being discussed vary slightly in detail, but would result in similar impacts.

Depletions of water from the Missouri River continue to increase as demands for water grow. These depletions increase the adverse impacts of the alternative on downstream reaches of the Missouri River and the Mississippi River. Depletions exacerbate the situation by increasing the frequency of shortened navigation seasons and years with no navigation. By lowering the total amount of water in the Missouri River reservoir system, these depletions would reduce

releases from the reservoirs, particularly during low precipitation. These years are often the same years that the Missouri River provides critical flow support to the "bottleneck reach".

The effects of the alternative and increased depletions greatly amplify the impacts of either one considered in isolation. They would prove harmful to Midwest agriculture, the ports from St. Paul to New Orleans and industries that rely on the Mississippi River to move their products and represent a serious blow to our nation's economy.

In addition to these considerations, the U. S. Fish and Wildlife Service has proposed an increased spring rise and a period of low flow in the summer to help three endangered and threatened species. If implemented, this would further exacerbate the effects of higher reservoirs and depletions. We support addressing endangered species issues in a reasonable manner that considers all environmental and economic issues. Substantial gains have been realized for the same species on the lower Mississippi River using creative habitat restoration without any change in river flow. This approach has succeeded without the disruption of normal river operations.

We urge you to ensure that decisions are reached on the operations on the Missouri River only with the direct involvement of all those states that rely on the Inland Waterway System. It is important that the Corps offer a briefing to all the Mississippi River states on the full effects of these proposals, including reasonably anticipated future depletions. We request that you direct the Corps to analyze the effects of the Fish and Wildlife Service proposals and reasonably anticipated depletions on the entire Mississippi River system and the compounded effects of these changes on the Corps' "Preferred Alternative". The Corps should not select its "Preferred Alternative" until these analyses and briefings have been completed and the states have been allowed time for meaningful input. Finally, we urge you to form an inter-agency group, including the Secretaries of Transportation and Agriculture, to review the implications of these proposals prior to implementation.

Respectfully,

Paul E. Patton
Governor of Kentucky

Don Sundquist
Governor of Tennessee

M.J. "Mike" Foster, Jr.
Governor of Louisiana

Ronnie Musgrove
Governor of Mississippi

George H. Ryan
Governor of Illinois

Bob Holden
Governor of Missouri

Mike Huckabee
Governor of Arkansas

Scott McCallum
Governor of Wisconsin

Jesse Ventura
Governor of Minnesota

cc: The Vice President
The Honorable Donald H. Rumsfeld, Secretary of Defense
The Honorable Gale Norton, Secretary of the Interior
The Honorable Ann Veneman, Secretary of Agriculture
The Honorable Norman Mineta, Secretary of Transportation

SOUTHERN
GOVERNORS' ASSOCIATION

Missouri River Flow Management Resolution

Sponsored by Governor Bob Holden of Missouri
Approved February 27, 2001
Southern Governors' Association Winter Meeting
Washington, DC

Whereas, the flow of commerce on the Mississippi River is essential to the economic welfare of the nation; and

Whereas, the United States Department of Agriculture reports that 70 percent of the nation's total grain exports were handled through Mississippi River port elevators; and

Whereas, more than one half of the nation's total grain exports move down the Mississippi River to Gulf ports; and

Whereas, free movement of water-borne commerce on the Inland Waterway System is critical to the delivery of goods to deep-water ports for international trade; and

Whereas, the reliability of adequate flows for navigation is a key requirement for fulfillment of delivery contracts, employment in ports and terminals, and energy efficiency; and

Whereas, delays and stoppages would threaten the successful implementation of international trade agreements under NAFTA and GATT; and

Whereas, the Missouri River contributes up to 65 percent of the Mississippi River flow at St. Louis during low water conditions; and

Whereas, reduction of Missouri River flows above St. Louis would result in more frequent and more costly impediments to the flow of commerce on the Mississippi River; and

Whereas, the reach of the Mississippi River between the mouth of the Missouri River at St. Louis and the mouth of the Ohio River at Cairo, Illinois is at highest risk for delays and stoppages of navigation because of low-water conditions; and

Whereas, the Northwestern Division of the U.S. Army Corps of Engineers (USACE) is considering several proposed alterations to the current edition of the Master Water Control Manual for the Missouri River that would reduce support of water-borne commerce by restricting the flow of the river during the summer and fall, low-water period at St. Louis; now, therefore, be it

Resolved, That the Southern Governors' Association would strongly oppose any alterations that would have such an effect and would urge the Corps to consult with affected inland waterway states prior to endorsing any proposal that would alter the current edition of the manual.

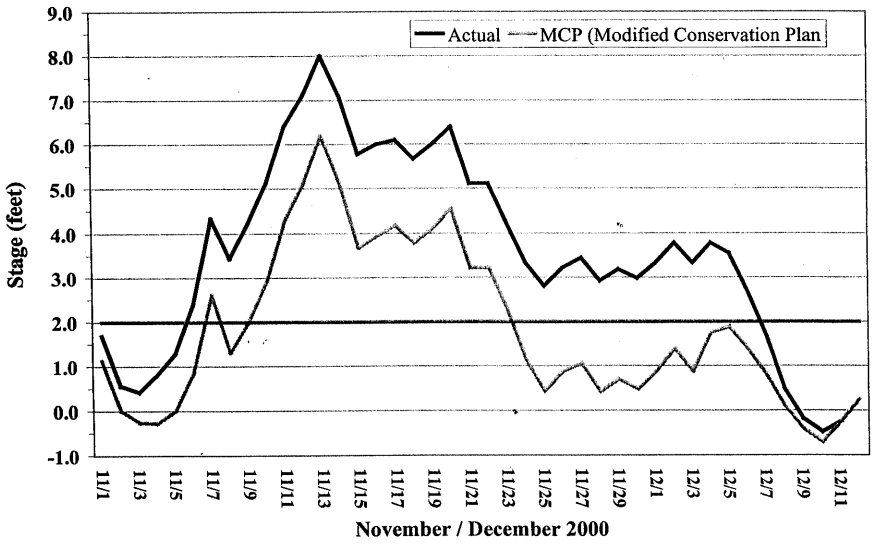
Miss 25

Other 6

HALL OF THE STATES 444 NORTH CAPITOL STREET, NW SUITE 200 WASHINGTON, DC 20001
202/624-5897 FAX 202/624-7797 WWW.SOUTHERNGOVERNORS.ORG

Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, Puerto Rico, South Carolina, Tennessee, Texas, U.S. Virgin Islands, Virginia, West Virginia

Miss 24



Note: Actual stages from USGS gage data, MCP stages were calculated based on operating criteria in plan.

Tribal 12-13

MISSOURI RIVER CLAIMS
(A PARTIAL LISTING)

DRAFT SUMMARY OF INDIAN WATER RIGHTS AS ENUNCIATED BY
THE MNI SOSE INTERTRIBAL WATER RIGHTS COALITION, INC.

RESERVATION	ANNUAL DIVERSION (Acre Feet)	ANNUAL DEPLETION (Acre Feet)
Blackfeet	878,000	323,000
Fort Belknap	211,000	87,000
Crow	2,114,000	738,000
Sioux Tribes	16,686,000	8,638,000
Wind River	510,000	480,000
Northern Cheyenne	90,000	30,000
Fort Peck	1,000,000	630,000
TOTAL	21,489,000	10,926,000

"Thus Indian reserved water rights are property rights predicated on federal law and are not dependent on state substantive law. These rights are part and parcel of the prior appropriation system recognized in one form or another in all of the mainland western states. The Indian Tribes along the Missouri may well elect to utilize their *Winter's* doctrine rights to establish larger permanent pools in the mainstem or tributary reservoirs in support of recreation and fisheries development for the long-term economic stability of the tribal homelands. **The Indian Tribes along the Missouri may well elect to sell their water to industrial or municipal consumers, either within or without the basin.** The Corps avoidance of the probable development of Indian water is nearsighted and improperly creates an impression that the future will merely be a reflection of the *status quo*."

Richard Bad Moccasin, Executive Director
Mni Sose Intertribal Water Rights Coalition, Inc.

S0300007

STATE OF MISSOURI
Bob Holden, Governor • Stephen M. Mahfood, Director
DEPARTMENT OF NATURAL RESOURCES

February 28, 2002

Brigadier General David A. Fastabend
Commander, Northwestern Division
U.S. Army Corps of Engineers
P. O. Box 2870
Portland, OR 97208-2870

Dear General Fastabend:

The Missouri Department of Natural Resources represents and protects the interests of the State of Missouri in all matters pertaining to interstate use of water, water quantity and water quality. The department also represents the Governor of Missouri on the Upper Mississippi and the Missouri River Basin Associations. As the water resources agency for the State of Missouri, the department submits the following comments on the Revised Draft Environmental Impact Statement (RDEIS) for the Review and Update of the Missouri River Master Water Control Manual (Master Manual).

Other 6

We must state at the outset that the Corps has yet to produce a reasonable alternative to the Current Water Control Plan (CWCP) that does not harm the state of Missouri and that continues to serve the needs of the nation. Coast Guard restrictions on the Mississippi River increase under all new plans, and the harm increases over time as depletions occur on the Missouri River. The CWCP protects the viability of Mississippi River commerce into the future, but the Modified Conservation Plan (MCP) and Gavins Point (GP) plans do not. Whatever plan is chosen, it will likely be in place for 40 to 50 years, so we cannot stress enough the magnitude of this decision. Fourteen million-acre feet (MAF) of depletions already occur annually. It is reasonable to expect at least an additional 3 MAF of depletions annually in the basin in the next 40 to 50 years.

Miss 26

Other 9

Reasonable alternatives to the plans presented do exist, and the Department of Natural Resources will work with the Corps to find such an alternative and analyze its impacts on the Missouri and Mississippi Rivers, the species that depend on the rivers and the people for whom the rivers are an inherent part of their lives and livelihoods. We have included a summary of our proposal at the end of this letter.

RECYCLED PAPER

With that stated, we are obligated to oppose all five of the new alternatives presented in the RDEIS for reasons set forth below. The comments contained in this letter and its attachments are to be considered in addition to the testimony we gave at the public hearings on behalf of the State of Missouri.

Critical Findings

- Public hearings revealed overwhelming stakeholder opposition to all of the proposed new plans because the Corps has failed to present a plan that balances the economic, social, and environmental needs of this great nation.
- The proposed spring rise would result in an unconstitutional taking of private property.
- The proposed summer low flow would result in an unconstitutional taking of private property.
- All new plans, including the MCP, dramatically increase reservoir storage. These plans would negatively impact Mississippi River and Missouri River commerce and must be drastically scaled back.
- The higher, more stable reservoirs included in all alternatives will inundate and degrade piping plover and least tern habitat.
- Proposed flow modifications from Gavins Point Dam adversely impact downstream states.
- Adverse economic impacts of the proposed new plans far outweigh the minimal gains.
- The RDEIS contains incomplete and erroneous analysis.

Explanation of Critical Findings

Public hearings revealed overwhelming stakeholder opposition to all of the proposed new plans because the Corps has failed to present a plan that balances the economic, social, and environmental needs of this great nation.

Department of Natural Resources staff attended nearly all of the public hearings and participated in countless stakeholder meetings during the comment period. The message we heard from Sioux City, Iowa, to New Orleans, Louisiana, was clear and decisive: "*All of the proposed new plans significantly harm downstream river users.*" The overwhelming majority of stakeholders supported the CWCP over any of the five new plans being proposed by the U.S. Army Corps of Engineers (Corps). At all of the hearings along the Missouri River in Iowa, Nebraska, and Missouri, we heard overwhelming opposition to all five of the new plans; at the hearings along the Mississippi River, we heard only support for the CWCP. In fact, more stakeholders at Quincy, Illinois, spoke in favor of the CWCP than spoke against it at the Pierre, South Dakota, hearing.

Other 95

To meet the improperly prescriptive demands of a small group of low-ranking U.S. Fish and Wildlife Service staff, the Corps failed to ensure that all of the Congressionally authorized purposes of the Main Stem Reservoir System were maintained. The mandate to maintain all authorized purposes was made clear by the U.S. Congress in the Energy and Water Appropriations Act for 2002 and signed by President Bush. Even though an

Other 6

extensive public participation process has been conducted, it is very evident that the Corps has again, as in 1994, not listened to the thousands of stakeholders that are affected most by changes to the management of the Missouri River. The Corps continues to propose plans that unduly harm downstream states.

Proposed spring rise would result in an unconstitutional taking of private property. The proposed spring rise would result in an unconstitutional taking of private property. Unfortunately, the Corps did not consider the substantial devaluation of prime farmland adjacent to the Missouri River that will result from a government-made spring rise. Such an action that causes damage to farmland would constitute an unlawful taking of private property. When the federal government raises a navigable stream like the Missouri River and maintains it continuously at that level, the government is liable "for the effects of that change [in the water level], upon private property beyond the bed of the stream." See United States v. Kansas City Life Insurance Co., 339 U.S. 799, 800-801 (1950) (change in river level caused by lock and dam results in unconstitutional taking of flooded Missouri farmland, including damage caused solely by impeded interior drainage); United States v. Dickinson, 331 U.S. 745, 749-751 (1947) (raise in river level constitutes an unconstitutional taking of the flooded land and the land which washes away as a result); and United States v. Cress, 243 U.S. 316 (1917) (an improvement on a navigable stream causing flooding on a non-navigable tributary is an unconstitutional taking of land along tributary).

Legal 31

Proposed summer low flow would result in an unconstitutional taking of private property.
The magnitude of summer low flow proposed by the Corps would necessitate significant increases in fall releases. These increases are due to the need to evacuate excess system storage that accumulates during the summer months when flows are drastically suppressed. The fall flooding resulting from these increases would constitute an unlawful taking of private property. (See attached *"Implications of a Reduced Summer Flow and Fall Flood Evacuation."*)

Legal 31

All new plans, including the MCP, dramatically increase reservoir storage. Among other impacts, these plans would negatively impact Mississippi River and Missouri River commerce and must be drastically scaled back.
The shift in season shortening triggers produces extreme negative impacts with minimal benefit to recreation. The impetus for changing the Master Manual originally centered on minimizing economic impacts to the reservoir recreational industry during periods of drought. The debate and solutions have largely focused on increasing reservoir recreational benefits. Under the MCP, the recreational benefits realized are $87.9 million annually, compared to the CWCP recreational benefits of $84.7 million annually. This is only an increase of $3.2 million in annual benefits. This amount of increased benefit is miniscule compared to the negative impacts imposed on downstream states. (See attached *"Recreation Benefits Analysis."*) To achieve this gain, the proposed changes in the operations of the reservoir system are extreme. This becomes apparent when

Rec 11

comparing the drought conservation triggers for the five new plans with the CWCP. For example, the July 1 system storage check that determines the length of the navigation season shifts the season shortening trigger from 41 MAF under the CWCP to 59 MAF under the five new plans. The shift in season shortening triggers is so extreme that the navigation season is shortened while system storage is still in the Annual Flood Control and Multiple Use Zone. This is 2 MAF above the top of the Carryover Multiple Use Zone, which is the storage zone designed to provide water during drought. By triggering cutbacks in service at such high reservoir storage levels, drought conservation measures are being imposed at a time when drought conditions may not exist. (See attached *"Navigation Support is Cut when Drought Conditions Do Not Exist.")* Substantial increases in the frequency of cutbacks in flow support for navigation would be devastating to waterborne commerce on both the Missouri and Mississippi Rivers.

Nav 62

All new plans include a significant increase in reservoir storage. Because all of the proposed new plans include similar increases in the amount of reservoir storage, it would appear that the Corps has already decided that any new plan will include features which shift a significant amount of water to upper basin users. The magnitude of this shift in reservoir storage is demonstrated by the results of modeling the 1988 to 1993 drought where total system storage increased by approximately 4 MAF for the MCP and GP options compared to the CWCP (RDEIS Summary). Even though some would have the public believe that the basis for changing the management of the Missouri River is to improve its ecosystem and protect the endangered species, in reality, the bottom line is who controls the water. The debate over how the Missouri River should be managed to improve the river health or habitat for endangered species should not have been clouded with the shifting of reservoir storage (water conservation measures). It is evident that these issues have not been properly segregated as evidenced by the fact that all of the proposed new plans provide for a similar increase in reservoir storage. The GP plans were supposedly formulated to improve the habitat for endangered species by modifying the downstream flow regime, yet all of the GP plans include greater system storage than even the MCP. This trend can be seen in the long-term average reservoir storage figures, with system storage averaging approximately 1.5 MAF greater with the MCP and approximately 2 MAF greater in the GP plans. (See attached *"The Shift in Reservoir Storage/Defacto Storage Reallocation."*)

Other 138

The term "water conservation" misleads the public. The whole premise that the MCP was formulated to minimize impacts during periods of drought is misleading. The MCP was designed to minimize the impact of drought around the reservoirs, particularly to recreational uses. Even the terminology used in this process shows a bias to the upper basin users. The notion of water conservation appears to be environmentally friendly when in this case it means that more water is stored in reservoirs for economic purposes. These water management measures are simply a shift in water storage and a shift in economic benefits. Maintaining higher reservoirs most of the time in fact may be detrimental to endangered species. (See attached *"Water Conservation Measures: a Misleading Phrase."*)

Other 139

Mississippi River impact analysis is incomplete. The Corps' presentation of Mississippi River impacts is totally inadequate considering the important role the Mississippi River plays in our nation's economy. Sensitivity analysis has shown that the Corps' analysis of Mississippi River impacts is inconclusive. (See attached *"Problems with Mississippi River Navigation Impacts Analysis."*) Our analysis shows that the MCP significantly increases the risk of low water impacts on the Mississippi River. When substantial cutbacks in reservoir releases on the Missouri River coincide with low flows on the Mississippi River, navigation restrictions would occur. Under CWCP operations, substantial cutbacks in releases on the Missouri River coincide with low water on the Mississippi River in only seven of the 100 years modeled. Under the MCP, the number of years that Missouri River cutbacks would have impacted the Mississippi River during low water increased to 30 years. When Missouri River flow support is curtailed, stages on the Mississippi River would be two to three feet lower during low water events. These analyses show that the risk to Mississippi River navigation is much more frequent as a result of the drought conservation measures in the MCP. Once the season shortening triggers have been established, additional withdrawals of water from the upper basin will only compound the frequency of curtailed flow support for navigation. These analyses make it apparent that the CWCP is the most reliable plan for supporting navigation on the Mississippi River. The lack of a comprehensive Mississippi River impact analysis underscores the fact that the Corps has not taken seriously the impacts that changes to the Missouri River operations will have on the Mississippi River. (See attached *"Increased Risk of Low Water on the Mississippi River."*)

Miss 19

All proposed plans reduce amount of usable water to downstream states. The State of Missouri strenuously opposes all plans that reduce the amount of usable water released to downstream states. Using the data provided in the RDEIS supporting documentation, calculations were made to show the total reductions in usable water related to navigation service reductions. Using full service navigation flows as the benchmark, the MCP provides approximately 25 MAF less usable water than the CWCP during the 100 years that were modeled. These shifts in usable water, which is used to support downstream uses, are the results of maintaining consistently higher reservoirs and in no way relates to the spring rise or summer low flows or any benefits for endangered species.

The GP plans decrease the amount of usable water even more than the MCP. The GP2021 plan provides approximately 63.5 MAF less usable water than the CWCP at Sioux City, Iowa, and approximately 44.5 MAF per hundred years less usable water at Kansas City, Missouri. (See attached "*Proposed Plan Shifts Water from Missouri.*")

Other 39

Storing more water in reservoirs negatively impacts many authorized purposes. Impacts to Missouri River and Mississippi River navigation are only one of the authorized purposes that would suffer due to the proposed reductions in flow support. Because the Missouri River provides drinking water to over 50 percent of the citizens of the State of Missouri and cooling water for several of the state's power plants, the Corps must ensure

WS 11

that all downstream water supply needs are met. In the summer, Missourians have not experienced non-navigational flows since the system was completed, and in winter, ice can exacerbate low water problems. All new plans should ensure that releases are adequate to meet water supply and power plant cooling requirements and avoid water quality impacts. Low non-navigational flows may also deprive the ecosystem of both the lower Missouri and Mississippi Rivers of water that would normally nourish wetlands, sustain fish and wildlife habitat and benefit riparian systems. The Corps' ability to regulate the reservoir system for flood protection will be diminished as reservoir levels are held higher more frequently.

WS (con't) 11

WRH 12

FC 13

The higher, more stable reservoirs included in all alternatives will inundate and degrade piping plover and least tern habitat.
Increased reservoir levels compared to the CWCP create more open water at the expense of shallow water and shoreline habitat. The RDEIS states that 1,300 acres of wetland and riparian zone would be converted to open water in the deltas under MCP. This dwarfs the 106 acres of nesting habitat gained under the most extreme GP proposal. On average, from eight to 12 miles of riverine habitat is lost due to higher reservoirs. The Corps does not present this information in the RDEIS. In addition, the Corps has conducted no analysis of the decrease in available shoreline habitat in MCP. Higher reservoir levels also narrow the width of the open sand areas along the reservoir and may degrade some open sand-nesting habitat. Shallow slopes along the reservoirs magnify greatly small changes in reservoir level, yet no analysis has been done on the impact of reservoirs held two to four feet higher on a consistent basis. The MCP was not proposed for endangered species concerns and may have a significant detrimental impact on the species that has not been investigated. In comparing benefits of the various plans, the Corps should exercise due diligence in examining negative impacts.

EnSp 20,22

Proposed flow modifications from Gavins Point Dam adversely impact downstream states.
An artificial spring rise below Gavins Point Dam increases the risk of flooding with little scientific evidence that the proposed increased flows will benefit the species. Because the channel immediately below Gavins Point Dam is deeply incised, a rise of 15,000 to 20,000 cubic feet per second (cfs) will not reconnect the river with the floodplain or scour vegetation from the floodplain. The Missouri River below the Platte River already receives a natural spring rise from tributary inflow. Missourians experience a spring rise frequently without an added artificial rise. An additional spring release compounds the effects of large rainfall events downstream of Gavins Point, thereby increasing the risk of downstream flooding. (See attached *"Increase Risk of Flooding From Spring Rise."*)

FC 2

We strongly disagree with the Corps' reference in the RDEIS that the increased flood damages caused by the spring rise are insignificant. The increase in flood damage to the State of Missouri is unacceptable. The GP alternatives would not only increase the risk of flooding but also would result in higher groundwater levels on productive farmland adjacent to the river and impede interior drainage behind the levees throughout the lower

basin. At the public hearings, large numbers of stakeholders from the agricultural community voiced their opposition to Gavins Point flow changes, especially the spring rise. The Corps flood control benefits analysis does not separate agricultural impacts from residential or commercial. Because levees protecting agricultural lands normally provide a lesser degree of flood protection than those protecting urban areas, agricultural lands would be flooded more frequently by a spring rise than urban areas. If the impacts to this sector were examined separately, a much greater impact would be shown to the agricultural sector.

FC 2 (con't)

Because the Corps did not include interior drainage and groundwater impacts as part of the flood damage analysis, it is evident that the economic impacts to the agricultural community have not been properly considered in the comparison of alternatives. If these damages had been calculated for the entire basin, the economic impacts would have been substantial. As an example, for those representative sites that were studied, the Gavins Point flow plans increased interior drainage and groundwater damages up to 10 percent. A 10 percent loss could be the difference between having or not having an economically viable operation. (See attached *"Spring Rise Impacts to Agricultural Lands."*)

IntD 8
GW 7

The RDEIS states that the primary purpose for the spring rise is to cue spawning for the pallid sturgeon. Considering that 2,000 miles of the pallid sturgeon's range already has a robust spring rise, it is preposterous to suggest that 200 miles will now reverse the sturgeon's demise. The RDEIS goes on to state that the scientific community does not understand the amount, timing, or length of the rise that is needed. Because there are so many assumptions or unknowns about the successful reproduction and recruitment of pallid sturgeon, to place so much emphasis on such a small segment of the historical range is not reasonable. (See attached *"Spring Rise and Pallid Sturgeon."*) The flood damage and drainage impacts from the proposed spring rise far outweigh the potential benefits.

EnSp 5

The proposed summer low flows would cripple or eliminate the navigation industry. The summer low flow component of the GP alternatives is primarily based on the need to create additional sandbar habitat for terns and plovers. However, these summer low flows would be detrimental to the navigation industry on the Missouri River. The industry has repeatedly stated that they cannot continue to operate on the Missouri River without eight months of dependable full service flow support in most years. All of the GP flow modifications would threaten the continued use of the Missouri River as a commercial inland waterway for a minimal gain of about 100 acres of additional sandbar habitat for terns and plovers. It is inconceivable that an entire industry would be eliminated to provide only about 100 acres of additional habitat for terns and plovers.

Nav 12
EnSp 46

Of the plans presented, GP2021 provides the greatest acreage of tern and plover habitat. The flow modifications in GP2021 from Gavins Point Dam only account for an increase of 106 acres of additional habitat when compared to the CWCP, and only 37 acres of this increase actually occurs below Gavins Point Dam. Not specifically addressed in the

EnSp 46

RDEIS are the losses in tern and plover habitat around the reservoirs due to changes in reservoir levels. The RDEIS does indicate that GP2021 eliminate 3,100 acres of riparian and wetland habitat in the reservoir deltas. (See attached *"Limited Gains in Least Tern and Piping Plover Habitat."*)

EnSp 20,22

As promoted by the U.S. Fish and Wildlife Service, the notion that these low summer flows mimic the natural hydrograph is not true. The levels and timing of these alternatives differ so dramatically from the historic hydrograph that the effects of these new reservoir regulations could actually be detrimental to the river's ecosystem. As an example, the nesting period of terns and plovers in the reach below Gavins Point is an interesting fit with flow conditions of the Missouri River. Nesting occurs from mid-May through August. Consequently, flows are often artificially suppressed during this period. This creates a low flow at a time when flows naturally would have been the highest. The flow suppression also creates a large fall rise at a time when flow would naturally have been low. (See attached *"Proposed Gavins Point Flow Plans do not Follow the Natural Hydrograph."*) We agree that a properly timed and proportioned reduced late summer flow will likely benefit some sections of the river's ecosystem. We believe that a plan that achieves a flow level that would benefit these species, while at the same time ensuring that long-term Missouri River commerce remains economically viable, is attainable given proper study.

EnSp 53, 47

Adverse economic impacts of the proposed new plans far outweigh minimal gains.
All proposed new plans shift economic benefits to the upper basin. The Corps has been given the difficult task of balancing all uses of the river while meeting all of the Congressional mandates. However, in all of the proposed new plans, the Missouri River states below Gavins Point Dam and Mississippi River states are damaged economically. In contrast, all new plans increase the economic benefits to the upper basin states. As an example, all of the new plans provide less flood control, navigation, water supply and recreation benefits to the State of Missouri than the CWCP. In addition, the Gavins Point alternatives damage Missouri River bottomland farmers by impeding interior drainage behind agricultural levees and creating higher groundwater levels on the floodplain during the planting season.

Other 6

The Endangered Species Act was used as an artifice to shift economic benefits to the upper basin. Missouri is firmly committed to improving the environmental health of the Missouri River. If improving the river's ecosystem has economic consequences, the sacrifices should be equally shared by both upper and lower basin states.

The RDEIS contains incomplete and erroneous analysis
An analysis of future depletions must be included in the RDEIS. Depletion analyses were not made for all plans, and those that were made include major analytical errors. As requested by nine Governors from Mississippi River states, the Corps' evaluations should have included future depletion analysis for all the alternatives. However, only two of the alternatives selected for detailed analysis in the RDEIS considered future depletions in

Other 27

the impact analysis. The MCP, which embodies the water conservation measures inherent in all of the new plans, was not analyzed with future depletions despite numerous requests for such analysis. The economic impact analysis of the two plans that did include future depletion analysis contained erroneous information. These errors were due to the different operating criteria (navigation precludes) being used for different levels of depletions. (See attached *"RDEIS Fails to Adequately Analyze Plans for Future Depletions."*) In the Corps' analysis the reservoir storage checks that retain more water in the reservoirs and reduce downstream releases were raised as depletions increased. Flow support to downstream water users should not be curtailed by unreasonable water use in the upper basin. Any new plan should address impacts of future depletions including a process to protect downstream users from major reservoir withdrawals or out-of-basin transfers.

Nav 64
Other 7

Vital analyses were not available to the public during the comment period. The full RDEIS was not available to the public until one month after the notice of availability was published in the Federal Register. Public hearings began without the public having sufficient time to review the RDEIS or any of the supporting documentation. Meaningful public comments have been limited by incomplete information. It is an injustice that the public comment period will have closed, and the Corps still will be engaged in several critical analyses. If these analyses are not available until release of the final Environmental Impact Statement, then the National Environmental Policy Act (NEPA) will have been compromised. (See attached *"Several Key Studies Will Be Completed After RDEIS."*)

Other 26

The formulation of the alternatives did not follow required planning procedures. In accordance with Principles and Guidelines, major components of any alternative should have been evaluated incrementally to properly identify the impacts of incremental change. As an example, reservoir unbalancing alone may provide significant environmental benefits with minimal disruption of river uses. However, the impacts of this component were not presented separate from other new features in the MCP, which masks any incremental benefits that resulted from reservoir unbalancing. If reservoir unbalancing had been added to the CWCP as a single component for modeling purposes, it would have accurately shown the benefits attributed to unbalancing. (See attached *"The RDEIS Fails to Analyze Each Component Proposed in the Alternatives Selected for Detailed Analysis."*)

Other 140

The RDEIS does not link the conclusions with supporting documentation. The document is not organized in a manner that allows the reader to follow the process for formulating alternatives, evaluating impacts and developing comparisons for decision making. A common thread that links conclusions or summary tables with the supporting analysis is not presented in a sequence that allows the reader to follow the analytical steps. Missing information or erroneous conclusion makes it difficult if not impossible to determine the impacts of the proposed plans. For example, specific criteria for the spring rise in the Gavins Point flow plans were vaguely defined in the RDEIS and were in conflict with the

Other 141

supporting documentation. (See attached *"Plan Criteria Not Well-Defined."*) This is not the only example where information did not track between the RDEIS and the supporting documentation. A problem was also identified in the Kansas City flow target. During fixed release periods, the target was missed by an average of approximately 5,000 cfs, 25 percent to 30 percent of the time. It is not clear whether this is a problem in the models or with the criteria, but, either way, it could have a substantial impact on the study results. (See attached *"Shortfall in Meeting Kansas City Navigation Target."*)

Nav 63

The Corps' economic analysis is incomplete and misleading. The display of the economic impacts of the alternatives is very misleading. The manner in which selective economic information was presented would lead a reader to conclude that the GP plans provide the greatest net economic return. However, a close review shows that only partial accounting of the benefits and losses were presented in the RDEIS. As an example, the navigation benefits attributed to the CWCP did not include water compelled or fuel (air quality) benefits. In earlier documents, the Corps estimated that water compelled benefits on the Missouri River alone ranged between $70 million and $200 million annually. Air quality benefits ranged from approximately $2 to $3 million annually. However, taking barges off the river and putting more trucks on the highways will jeopardize the air quality improvements the State of Missouri has made in the St. Louis area. The St. Louis area is currently in moderate nonattainment of the ozone standard. Not reaching attainment of this standard will create a huge economic burden on the St. Louis area and the entire State of Missouri.

Nav 6, 8

Nav 23

Another example of incomplete economic analysis was the fact that lost revenues resulting from low summer flows (GP plans) to the Western Area Power Administration were not deducted from the hydropower benefits. Under the GP1521 and the GP2021 plans, this amounted to lost revenues of $30 million annually, an impact that will be borne by the ratepayers.

Hpower 12

In addition, damages resulting from increased interior drainage problems or higher groundwater levels were not included in the National Economic Develop (NED) account. It is apparent that if all of the benefits, losses, and damages had been included in NED account, the GP plans would not have had the greatest economic returns. (See attached *"National Economic Development Analysis is Incomplete and Misleading."*)

IntD 8
GW 7

Important reservoir management criteria were not evaluated in the RDEIS. The RDEIS is overly focused on specific operational aspects. Consequently, some options have been overlooked. A criterion that does not appear to have been evaluated properly in the RDEIS is the September system storage check that sets winter releases. As an example of the importance of this check, reservoir storage going into the 1988 to 1993 drought was approximately 1.5 MAF below the annual March storage goal. Had winter releases been curtailed to minimum levels, the reservoirs would have gone into that drought approximately 1 MAF higher than what the plans in the RDEIS indicated. It is surprising that the Corps did not evaluate this criteria considering that in the 2000-2001 Annual

Hydro 39

Operating Plan, the Corps suggested using projected March storage instead of September 1 storage to dictate winter reservoir releases. (See attached *"September System Storage Check Was Not Evaluated/Options Explored."*) Also not factored into the reservoir management criteria are the reservoir releases made in May and June related to tern and plover nesting. This operation, included in the RDEIS plans, is not part of the Corps' present operations. In the long-term operation of the reservoir system these additional releases may not be needed, and the water could be used for other uses. (See attached *"Additional Water from Maintaining Adequate Tern and Plover Habitat."*) Another operational consideration would have been to have separate management objectives for the reservoirs. Lake Sakakawea has a marginal cold water fishery that is extremely difficult to maintain. Fort Peck and Lake Oahe could be optimized for cold water fishery while Lake Sakakawea and the reach between Garrison Dam and Lake Oahe could be optimized for tern and plover production. (See attached *"Cold Water Fisheries Analysis: Lake Sakakawea is a Marginal Cold Water Fishery."*)

EnSp 57

Fish 20

Missouri's Alternative Proposal

Missouri supports a proposal that includes reduced flows in late summer coupled with aggressive habitat restoration efforts as part of a comprehensive approach to meet the needs of the threatened and endangered species while recognizing the importance of other river uses.

The Corps has yet to produce any alternative to the CWCP that does not harm the State of Missouri, other downstream states and Mississippi River states. The State of Missouri believes that a clear set of decisions can be made that will avoid jeopardy and enhance the ability of the Missouri River to meet the demands placed upon it.

Other 142

To evacuate excess water, river flows are often above full service navigation targets. To enhance wildlife and recreation in the lower river, when practical and consistent with other project purposes, the Corps should reduce releases from August 1 through September 15 to full navigation service levels (corresponding roughly to 41,000 cfs at Kansas City). This remains the only proposal for changes in flow below Gavins Point dam that has the support of all the states in the basin. The timing of this proposal matches the low flows of the historical hydrograph better than the GP alternatives presented in the RDEIS and can be accomplished without the rapid, artificial late summer rise in discharge that characterizes all of the GP alternatives. With basin-wide endorsement, it is puzzling why this proposal was not presented as one of the final plans in the RDEIS. Full consideration of this proposal should be included in the Corps deliberations and should be made available to the public as part of the public input requirements of NEPA.

Other 142

Many of the U.S. Fish and Wildlife Service's Reasonable and Prudent Alternatives unrelated to changes in flow below Gavins Point Dam do provide benefits for the three threatened and endangered species and are supported by those all along the Missouri River. Reservoir unbalancing, which does not require the implementation of the MCP, will preserve both aquatic and open shoreline nesting habitat. Expanded physical,

Other 143
EnSp 47

biological, and chemical monitoring is necessary to increase our understanding of this system and the species that depend upon it. Species Recovery Committees, including a diverse, multidisciplinary group of scientists and stakeholders, are crucial to integrate the newest information on the species, their needs and their progress. The coordinated efforts to augment the pallid sturgeon population using the state and federal hatcheries provide a critical bridge for this species while habitat is restored. The department is pleased by the increased attention focused on the role of the dams in impeding sediment flow and discussion of possible methods to re-establish sediment transport. The Corps should aggressively investigate increasing sediment delivery to those reaches immediately below the dams.

EnSp 47 (con't)

Restoration of habitat for all the native species that depend on the river remains a critical need. The St. Louis District has over 20 years of experience in the use of environmental river engineering to create and improve fish and wildlife habitat on the Mississippi River without implementing flow alterations. The projects have proven to be tremendously effective. These same engineering techniques should be used on the Missouri River to restore habitat for the pallid sturgeon and other species at risk. We look forward to working with the Corps to achieve the necessary shallow water and sandbar habitat. The lowermost sections of the Missouri River already experience a natural variation in flows because of tributary influences.

EnSp 1,29,48

Federal programs already exist to achieve the habitat goals spelled out in the Biological Opinion for the river downstream of Gavins Point Dam. The Department of Natural Resources has strongly supported an expansion of the Missouri River Mitigation program. The additional authorization of 118,000 acres for mitigation in 1999 offers the opportunity for significant habitat gains. The department has urged our congressional delegation to support the increased funding for the mitigation program currently in the President's budget. Habitat increases for the native species can also be achieved through the expansion of the Big Muddy Wildlife Refuge to the authorized 60,000 acres. The Missouri Departments of Natural Resources and Conservation are also working to restore habitats for native species along the Missouri River. When considered together, these programs offer an unprecedented opportunity to dramatically increase the shallow water and sandbar habitats so critical to the threatened and endangered species.

Methods other than the GP proposals could meet the habitat needs of the piping plover and least tern. The 106 acres of potential nesting habitat gained under the most extreme flow proposal are counterbalanced by losses in shoreline habitat along the reservoirs that have yet to be calculated. Under this plan, an average of about 11 miles of potential nesting habitat in the upper ends of the reservoirs are sacrificed due to higher reservoirs. Up to approximately 3,100 acres of wetland and riparian habitat are also lost in the reservoir deltas. Proper engineering design offers far greater habitat gains than the GP plans without the significant adverse economic consequences to river transportation and increased flood risks to agriculture caused by the artificially reduced flows in the early summer and the consequent need to increase fall flows to evacuate the reservoirs.

EnSp 20,22,46

In conclusion, we must again emphasize the need for the Corps to produce an alternative that does not harm Missouri and continues to serve the needs of the nation. The Corps should broaden the range of potential actions to include the Missouri flow proposal and other operational options (i.e., September storage check). The Corps should provide the public with the opportunity to examine the impacts of each potential action independently. The analyses that support each proposed action should be made clear to those who will be most directly impacted by proposed changes. Furthermore, the Corps should complete and make available to the public its analyses of impacts on the Mississippi River, as promised, because the changes under consideration have impacts beyond the Missouri River itself.

If the Master Manual is to be changed, the Corps should listen to the stakeholders and develop a plan that balances the economic, social, and environmental needs of our nation as recommended by the recent National Academy of Sciences report. Thank you for the opportunity to offer our department's insights into this critically important issue. We look forward to working with the Corps and the other stakeholders in the basin as we move forward.

Sincerely,

DEPARTMENT OF NATURAL RESOURCES

Stephen Mahfood
Director

SM:jm

Attachments

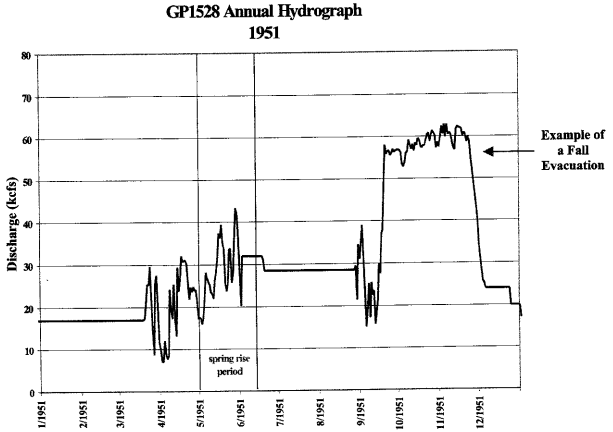
Missouri River Master Manual
Topical Issues

Implications of a Reduced Summer Flow and Fall Flood Evacuation page 15
Recreation Benefit Analyses page 18
Navigation Support is Cut When Drought Conditions Do Not Exist page 30
The Shift in Reservoir Storage/Defacto Storage Reallocation page 34
"Water Conservation Measures:" a Misleading Phrase page 38
Problems with Mississippi River Navigation Impacts Analysis page 39
Increased Risk of Low Water on Mississippi River page 41
Proposed Plan Shifts Water from Missouri. page 48
Increased Risk of Flooding from Spring Rise page 50
Spring Rise Impacts to Agricultural Lands page 52
Spring Rise and Pallid Sturgeon page 55
Limited Gains in Least Tern and Piping Plover Habitat page 58
Proposed Gavins Point Flow Plans are Not Consistent with the "Natural Hydrograph" page 62
RDEIS Fails to Adequately Analyze Plans for Future Depletions page 67
Several Key Technical Studies Will be Completed After RDEIS page 71
RDEIS Fails to Analyze Each Component Proposed in the Alternatives Selected for Detailed Analysis page 74
Plan Criteria Not Well-Defined page 75
Shortfall in Meeting Kansas City Navigation Target page 76
National Economic Development (NED) Analysis is Incomplete and Misleading page 82
September System Storage Check Was Not Evaluated/Options Explored page 84
Additional Water From Maintaining Adequate Tern and Plover Habitat page 86
Cold Water Fisheries Analysis: Lake Sakakawea is a Marginal Cold Water Fishery page 87

Implications of a Reduced Summer Flow and Fall Flood Evacuation

All alternatives including the Current Water Control Plan has a period from roughly May 10 through August 20 where the Corps maintains a flat release to provide nesting habitat for the federally endangered interior least tern and piping plover. As a result of this operation, evacuation of water from the reservoirs is held until after August 20, when evacuation of water creates a fall rise.

An additional reduced summer flow period (June 21 through September 1) is inherent in all of the GP plans. Although typically characterized by the Fish and Wildlife Service as an element resembling the natural hydrograph, this low flow period and resulting fall rise is clearly artificial. This reduced summer flow operation added on to the May 10 through August 20 tern and plover releases increases the magnitude and frequency of fall flood evacuation flows. This fall rise is necessary to evacuate flood storage in order to prepare for the upcoming spring flood storage. The Corps notes this occurrence on page 2-11 of the 2001 RDEIS stating that "*plans with low summer service levels increase the need for fall and sometimes spring flood zone evacuation*". In many years this operation dwarfs both the magnitude and duration of the proposed spring rise.



Groundwater Crop Damages

The Corps examined fall groundwater crop damages from fall flood evacuation due to the reduced summer releases. The Corps estimates average annual fall groundwater crop damages in levee unit L575 near Hamburg, Iowa increasing from $200,000 to $290,000 over the CWCP. For this levee unit the Corps estimates $23,600 per kcfs of summer reduction for alternatives with a reduced summer flow. The Corps did not present results for groundwater crop damages seasonally for the five other federal levee districts.

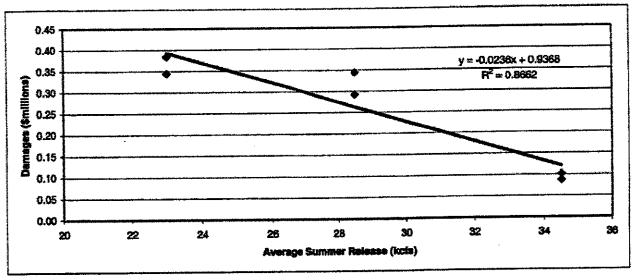


Figure 7.8-21. Average annual fall groundwater crop damages at site L575 versus amount of Gavins Point Dam average summer release.

Interior Drainage Impacts

The Corps evaluated the estimated fall interior drainage damages from a fall flood evacuation due to the reduced summer releases. For this analysis the Corps used the average May 15 through September 1 period. Their analysis shows that the less water moved in the spring and summer the greater the quantity of water to be evacuated in fall and thus the greater the interior drainage damages. The Corps estimates the fall interior drainage damages for levee unit L575 for the GP alternatives ranged from $23,760 to $ 59,850 over the CWCP. The Corps estimates a $8,030 increase in interior drainage damages per kcfs of flow reduction. The Corps did not present results for interior drainage damages seasonally for the five other federal levee districts.

Figure 7.8-12. Average annual interior drainage damages for the post-September 6 timeframe at site L575 versus average May through August release from Gavins Point Dam.

Flood control benefits were not evaluated seasonally. Therefore, the flood control impacts of reservoir evacuation flows, which are attributed to the additional storage retained in the reduced summer low flow period, cannot be evaluated.

Recreation Benefit Analyses

Under the Current Water Control Plan (CWCP) the upper basin has developed a major recreational industry estimated to provide annual benefits of approximately $65 million. The total estimated recreational benefits to the Missouri River basin are estimated to be $84.7 million annually. One of the primary reasons given for changing the management of the Missouri River Mainstem Reservoir system was to minimize the impacts to recreational industry around the reservoirs during periods of extended droughts. All five of the proposed new plans have a similar level of "drought conservation" measures imbedded in the plans which result in the storage of more water in the upstream reservoirs while decreasing the amount of water available for downstream designated uses. All of the proposed new plans release less water to downstream users to protect upstream uses such as recreation.

Of the alternatives presented in the RDEIS, GP2028 provides the greatest increase in recreational benefits when compared to the current plan, which is estimated to be an increase of $3.8 million annually. Under GP2028, the annual recreational benefits in the upper basin increases from $65.0 million to $69.3 million while the lower basin actually shows a decrease of $0.4 million.

This analysis shows that the recreational industry has thrived under the Current Water Control Plan and the economic gain is at the expense of other uses. When comparing the increase in reservoir recreational benefits in the upper basin to the adverse economic impacts to the many downstream uses, one should surmise that downstream losses far outweigh any gains in upper basin recreational benefits.

We believe that the benefits analysis for reservoir recreation has been skewed by the methodology that was used. The following paper discusses some of these issues.

DIVISION OF STATE PARKS REVIEW COMMENTS

COE MASTER MANUAL

REVIEW OF THE RECREATIONAL BENEFITS REPORTED IN THE REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (AUGUST 1998) ON THE MASTER WATER CONTROL MANUAL MISSOURI RIVER REVIEW AND UPDATE STUDY

PREPARED BY: JIM CRABTREE
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF STATE PARKS

JANUARY 8, 1999

The following is a review of the recreational benefits reported in the Revised Draft Environmental Impact Statement (August 1998) on the Master Water Control Manual Missouri River Review and Update Study. The comments below are based on a review of this document and the supporting Economic Studies of Recreation (July 1994) and revised in August 1998.

❖ SUMMARY

According to the data presented in the Master Water Control Manual Review and Update Study, hunting, fishing, and boating are major recreation types in the region. Reservoir and river water levels affect recreation opportunities. For the 100-year study period, the average annual recreation benefits for the alternatives range between $90.1 million (C44) and $84.6 million (C18). Alternative C44 results in about 6 percent positive impact compared to the CWCP and alternative C18 results in a positive impact of less than 1 percent. Drought has a significant impact on recreation opportunities under each alternative. Over 70 percent of the more than 10 million recreation days (1993) take place in the upper lakes and river reaches.

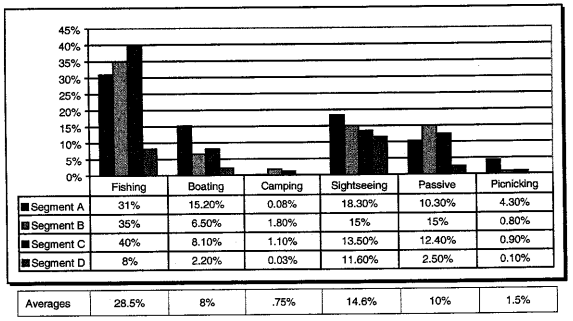
Impacts of the eight representative alternatives to recreation were measured by estimating the monetary benefits derived from various forms of recreation over the historical 100-year period of analysis, 1898 to 1997. The estimates developed were for benefits that ranged between $66.5 million (C44) to $60.4 million (CWCP and C18). The range in recreation benefits among alternatives within intrasystem river and lower river portions was only $830,000. Generally, the study revealed that higher storage levels in the lakes limit reductions in benefits during periods of drought.

The study has utilized data on anglers as its basis. Thus, stable lake fluctuations will result in higher probable participation use rates and expressed benefits. Whereas other non-consumptive uses would be less impacted by lake fluctuations.

❖ PARTICIPATION RATES

The participation rates utilized in the Master Manual are based on a Licensed Angler Survey. The use of this data skews the study towards a fishing emphasis. The COE report justifies this by stating:

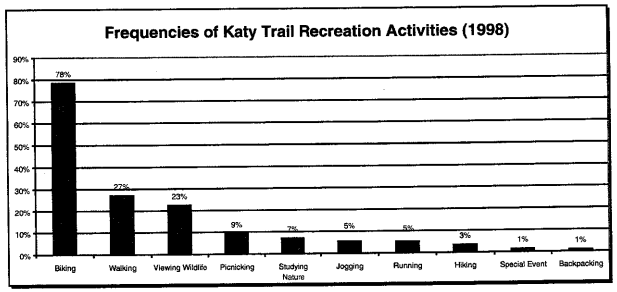
> *The advantage of a consistent sample design for licensed angler populations at the mainstream lakes and downstream river reaches added efficiency to the statistical design of the study. Also, the significantly high level of fishing activity reported by the MDC for river miles 0 – 553 during the period 1983 – 1987 provided additional support for the survey of licensed anglers.*



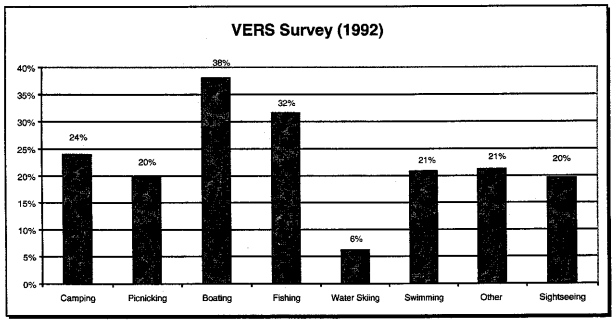
	Fishing	Boating	Camping	Sightseeing	Passive	Picnicking
Segment A	31%	15.20%	0.08%	18.30%	10.30%	4.30%
Segment B	35%	6.50%	1.80%	15%	15%	0.80%
Segment C	40%	8.10%	1.10%	13.50%	12.40%	0.90%
Segment D	8%	2.20%	0.03%	11.60%	2.50%	0.10%
Averages	28.5%	8%	.75%	14.6%	10%	1.5%

While this study provides insightful data on the users of the river access areas, it does not accurately portray recreational participation rates. The methodology appears biased towards fishing as that is the primary activity the facility supports. It would be like conducting a recreational participation study at the entrance to a bowling alley. You would collect substantive information on bowlers but could not opine that bowling is the general publics preferred activity.

For instance, a recently (1998) conducted survey along the Missouri River corridor of Katy Trail users portrays a very different set of recreational activities. Results of this survey indicate the following participation rates.

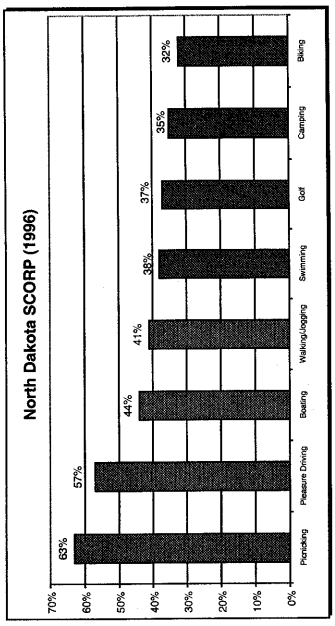


The participation rates utilized in the 1992 Visitation Estimates and Reporting System (VERS) Survey are outlined below:

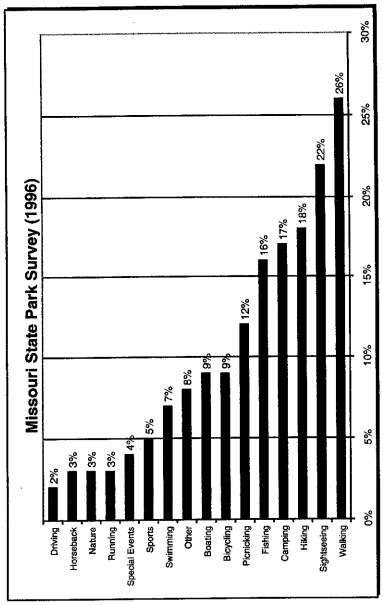


George G. Fleener completed the MDC report Recreational Use Survey of the Missouri River in Missouri in 1989. The purpose of the study was to provide resource data for state and federal agencies responsible for resource planning, so they would be better able to evaluate the effects of proposed projects on the river-oriented recreation. Specifically, the report was written in reference to the proposal by South Dakota to sell Missouri River water to Wyoming for a slurry coal pipeline (Missouri Basin States Association, 1982).

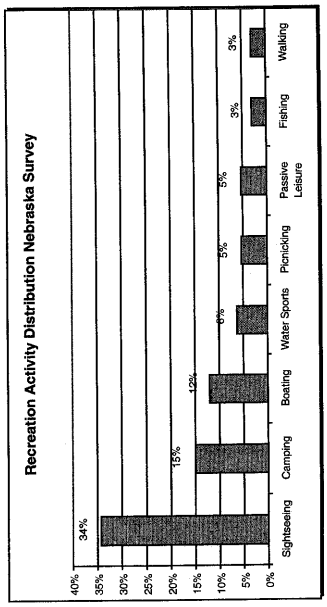
The report utilized a non-uniform probability survey on visitors to public and private access sites along the 553-mile river corridor. The total number of visitors interviewed was 69,747. The number of sites included 23 MDC and 41 non-MDC sites. All these sites provided developed or undeveloped river access. The data revealed that 32% of all visits occurred at the 23 MDC access sites. Some of the activity participation rates are illustrated on the following page:



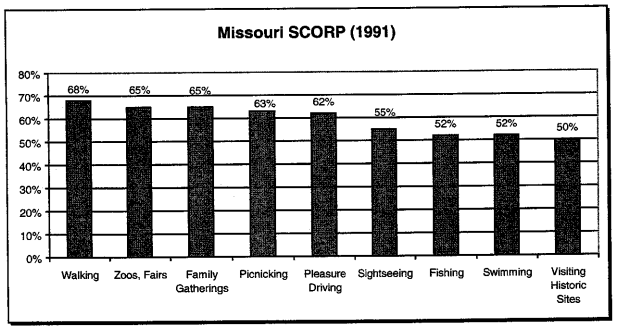
A random recreational survey of Missouri residents in 1996 parallels the North Dakota SCORP results. In the Missouri survey of recreational patterns, walking for pleasure, sightseeing, hiking and camping were the top four activities.



As a comparison for river recreation, the Recreation Activity Distribution – Nebraska Survey is presented below:



As a reference, we received the North Dakota SCORP and found that fishing did not rank high as a preferred recreational activity. In fact, picnicking, driving for pleasure, walking and boating were the top four activities.



The greatest fallacy using data from MDC on river recreation and comparing or projecting that data to flat water recreational lakes is the level of developed recreational areas. The Missouri River corridor has very few developed recreational sites. The level of available facilities will directly correlate to activity levels.
Since the MDC study was written several significant recreational sources have been developed along the river corridor. These include:

- Weston Bend State Park
- Katy Trail State Park
- Duetschheim State Historic Site
- City of Washington Marina and Riverfront Park
- Big Muddy River restoration project
- Columbia wetland demonstration area
- Eagle Bluffs
- MDC access at New Haven

Thus, a current study of recreational participation rates based on the users of the recreational facilities in the Missouri River corridor could project a very different picture.

❖ RECREATION VISITATION

The levels of recreation have historically been in the range of 12 to 13 million visitors according to the technical report (page 1). An alternative method of projecting lake visitation was conducted due to the disparity between the historical data and a 1991 angler survey conducted in Montana. The COE determined that their original surveys were inflated and conducted new surveys in 1992. The surveys in 1992 indicated even greater visitation.

The three different visitation studies resulted in varying visitation rates. The decrease of 100% from the historical data raises a red flag on traditional traffic counting techniques. If the three studies are statistically sound there should be a general trend or similar results if they were properly conducted. Since there is a large deviation from the historical data and a 12% variation in the 1992 – 1993 data, the survey tools may be inaccurate or there may be a secondary cause and effect, such as weather, economy or special events that influenced the results.

Data	Recreation Days
Historical data projected	12 – 13 million
Angler Survey (1991)	7.1 million (57% decrease)
1992 Surveys (VERS)	6.7 million (6% decrease)
1993 Estimate (NED)	7.1 million (6% increase)

The data suggests that the historical projection was very inaccurate. The 12% margin of error between the 1991, 1992 and the 1993 data is rather large. If the 1992 data is assumed to be valid, we should substantiate the 6% growth rate in one year.

❖ ECONOMIC BENEFITS

The National Economic Development (NED) values the recreation benefit at mainstream lakes to be about $67 million annually. This is based on the 7.1 million recreation days valued at an average of $9.65 per day (Travel Cost Method). The recreation below Gavin's Point Dam is estimated at $19.1 million with 3.1 million recreation days valued at $6.08 per recreation day. This higher value may represent camping or incorporate new sales.

The $6.08 benefit appears high to me. In earlier documents the NED value of recreation days averaged $5.80 (Unit Day Method) while the value range was $2.00 to $7.50.

MDC conducted a study in 1988 entitled Economic Valuation of Recreation Activity on the Missouri River. The study was based on the simplified travel cost model and determined the following:

- Consumer values per trip for seven discrete user activities ranged from $1.75 for angling to $4.18 for waterfowl hunting.
- Non-consumptive activities averaged $4.03 per trip, one dollar more than consumptive activities that averaged $3.01 per trip.

smallest change – a 7% decrease. Again, the bias towards flat-water fishing activities accentuates the trends.

A comparative example of user activity preferences is offered in the National Survey on Recreation and the Environment. The charts show trends in recreational activities.

The 1994-95 National Survey on Recreation and the Environment (NSRE) is the latest in a series of national surveys that was started in 1960 by the Outdoor Recreation Resources Review Commission (ORRRC).

This report is one of a series that describes the results of the 1994-95 National Survey on Recreation and the Environment (NSRE). The emphasis here is on recreation activities for which public land management agencies supply various outdoor recreation.

Data was collected from January 1994 through May 1995. A total of 17,216 interviews were completed. Questions were asked about participation in 68 specific outdoor recreation activities. For some of these activities, there is a subset of more specific types of that type of activity.

Overall, the trend for outdoor recreation participation indicates continued growth in the demand of outdoor recreation opportunities, facilities, and services. Naturally, with an increase in total population, Increases in participation for most activities would be expected. Activities that showed an increase in the number of participants include:

- Consumptive activities comprised 46% of the total visits while non-consumptive activities represented 54%.
- Fishing represented 37% of the estimated activities, sightseeing 16%, and boating represented 7%.

The NED recreation benefits really only model and evaluates the effects of fishing on the economic activity, employment and income.

❖ LICENSED ANGLER SURVEY

A survey of licensed anglers was conducted by Danes and Moore ("Report on Fishing License Data Collection and user Survey Recommendations for the Missouri River") to determine the impacts resulting from droughts on recreation use. The logic of using anglers was based on the premise that they represent a baseline use. Unfortunately, based on the participation rates used by most agencies anglers represent a small population of recreational use by the public. This may result in overstating the impact of droughts on recreation.

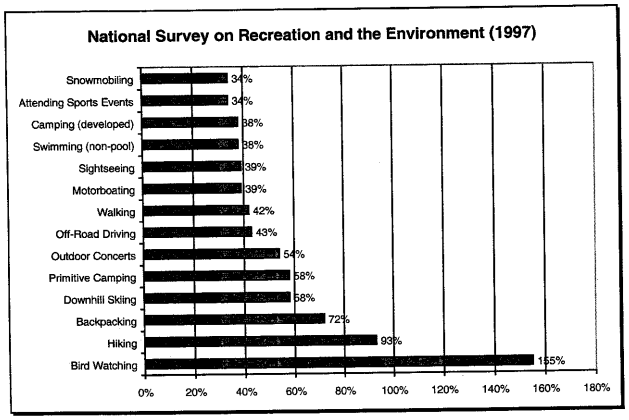
A second problem that needs to be considered is whether drought actually displaces the economic benefit. A drought may simply cause a shift in spending from one activity to another. If users are merely shifting their spending from one activity or region to another. This results in no new spending. Thus, the reported "losses" (page 11) may not actually result in economic losses.

❖ NED BENEFITS

The potential recreation daily benefit values total $87.1 million. The benefits were based on 1993 traffic counts utilizing the 1992 lake recreation site survey data. Additional research is needed to ascertain the traffic counts. The flooding in the lower and upper Midwest may skew the traffic counts if fishing activities in Iowa, Minnesota, Missouri and Nebraska were displaced to the study area. Perhaps tourism data could verify this.

The visitation may also be influenced by the major capital improvements the COE made to boat ramps in years 1989, 1990 and 1991. These improved facilities came on line in 1992. COE and state marketing programs in conjunction with full reservoirs in 1993 may have created inflated visitation counts with an emphasis on fishing as an activity.

The use of recreation benefits based on the Travel Cost Method evaluation versus the Unit Day Value indicates significant increases. The total increase is 35% while the upper lakes represent a 38% – 47% increase in stated benefits. The lower lakes show a 31% – 33% increase in benefits while the river section indicates the



Activities that showed a decline in the number of participants include tennis (-29 percent), hunting (-12 percent), horseback riding (-10 percent), sailing (-9 percent), fishing (-4 percent) and ice skating (-1 percent). In terms of natural resource oriented activities, the trend seems to be for some declines in participation in consumptive activities such as hunting, while non-consumptive activity participation seems to be on the rise.

In summary, the recreational studies used in the COE Master Manual appear to be biased towards fishing. This bias may skew the recreational benefits towards those alternatives that provide higher constant reservoir pool levels in the upper watershed.

The long-range impacts of using fishing as the preferred activity should project a declining participation and less loss in the NED but a shift in activity or regional (RED) participation.

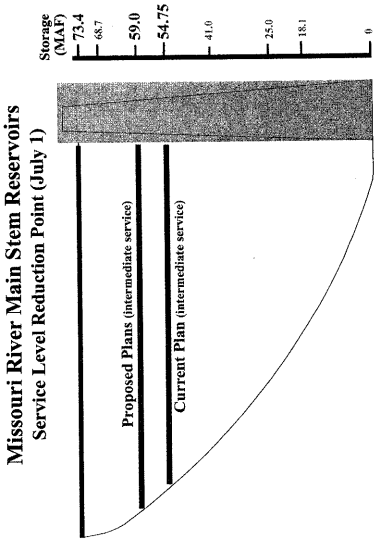
Navigation Support is Cut When Drought Conditions Do Not Exist

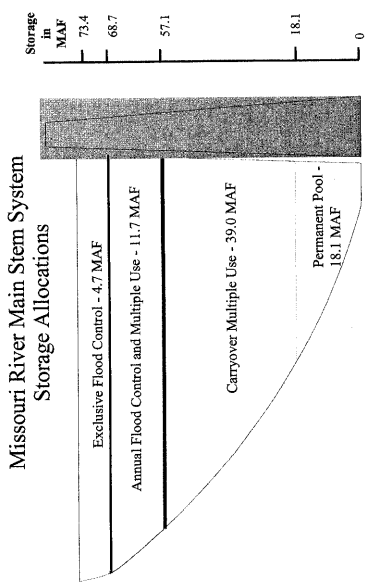
The Mainstem Reservoir System is broken into zones and described in the RDEIS. **Annual Flood Control and Multiple Use Zone**... *"This zone is used to store the high annual spring and summer inflows to the lakes. Later in the year water stored in this zone is released for riverine uses so that the zone is evacuated before the next flood season on March 1".* (RDEIS, page 2-4) **Carryover Multiple Use Zone**... *"is designed to provide water for all uses during drought periods."* (RDEIS, page 2-4) In simple terms, the reservoir system was designed so that the Annual Flood Control and Multiple Use Zone is utilized during "normal" times and the Carryover Multiple Use Zone is intended to provide flow support through a drought.

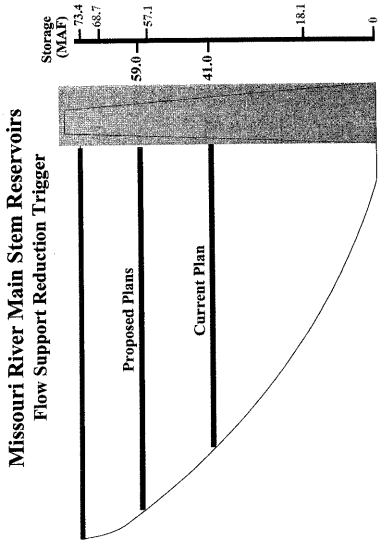
The RDEIS also describes cutbacks in navigation service that would occur during drought periods... *"Augmenting downstream tributary flows by releasing water from the Mainstem Reservoir System provides support for navigation on the Missouri River below Sioux City. In drought periods, storage water is limited and cutbacks in releases may shorten the navigation season and reduce navigation service."* (page 2-4, RDEIS)

The Current Water Control Plan incrementally reduces reservoir releases as a drought progresses. Season shortening would likely not occur until a couple of years into a drought, when system storage falls below 41 MAF on July 1. Service reductions occur earlier in a drought, with the maximum service reduction being approximately 1,500 cfs, when the reservoirs begin to fall into the Carryover Multiple Use Zone (July 1 storage check). In contrast, the five new plans (Modified Conservation Plan (MCP) and Gavins Point Flow Plans (GP Plans)) trigger season shortening and service reductions when System storage is less than 59 MAF on July 1. This is approximately 2 MAF above the base of the Annual Flood Control and Multiple Use Zone. For the Modified Conservation Plan the reduction in navigation support is a 27-day season shortening and 3,000 cfs service reduction. Navigation support is cut when reservoir storage has not even fallen into the drought pool. Attached are charts that compare the "drought" triggers that cut navigation support for the Current Water Control Plan and proposed new plans.

The consequence of setting the drought triggers while reservoir storage is still in the Annual Flood Control and Multiple Use Zone is that navigation support is cut, when a "*drought period*" does not exist. Some examples that demonstrate this point include 1903, 1911, 1919, 1944, 1980, and 1985. Attached is a table showing the July 1 System storage (June end-of-month) and runoff for that year. Note that median runoff is 24.6 MAF and lower quartile runoff is 19.5 MAF (Corps of Engineers, 2000-2001 Annual Operating Plan, page 3).


Missouri River Main Stem Reservoirs
Service Level Reduction Point (July 1)
Storage (MAF)
73.4
68.7
59.0
54.75
41.0
25.0
18.1
0
Proposed Plans (intermediate service)
Current Plan (intermediate service)


Missouri River Main Stem System
Storage Allocations
Storage in MAF
73.4
68.7
57.1
18.1
0
Exclusive Flood Control - 4.7 MAF
Annual Flood Control and Multiple Use - 11.7 MAF
Carryover Multiple Use - 39.0 MAF
Permanent Pool - 18.1 MAF


Missouri River Main Stem Reservoirs
Flow Support Reduction Trigger
Storage (MAF)
73.4
68.7
57.1
59.0
41.0
18.1
0
Proposed Plans
Current Plan

Year	July 1 Storage (MAF)	Runoff (MAF)
1902	59.5	20.9
1903	**58.9**	**24.6**
1904	65.0	25.5
1910	63.2	23.2
1911	**57.2**	**22.7**
1912	64.1	33.6
1918	64.7	26.3
1919	**57.5**	**13.9**
1920	61.8	29.2
1943	50.2	31.5
1944	**58.0**	**29.8**
1945	60.2	22.8
1979	64.9	29.5
1980	**57.9**	**18.8**
1981	55.9	19.3
1982	63.2	33.3
1983	62.7	27.1
1984	65.5	30.8
1985	**58.2**	**18.6**
1986	66.7	36.3

Notes:
Bold years would have had navigation support cut under MC
When Reservoirs are still in Annual Storage Zone
Data from U.S. Army Corps of Engineers
July 1 storage data not available, end of June storage was us

The Shift in Reservoir Storage/Defacto Storage Reallocation

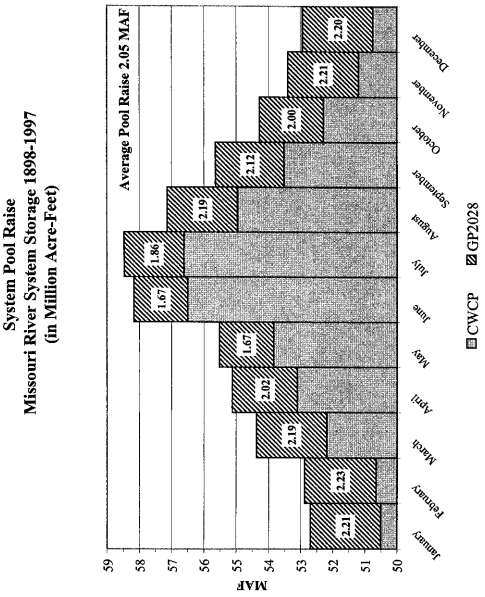
All the alternatives that the Corps has selected for detail analysis in the 2001 RDEIS keep the reservoirs consistently higher with the exception of the Current Water Control Plan. This deliberate raising of the guide curves and preclude are a direct and readily apparent transfer of water from the lower basin to the upper basin.

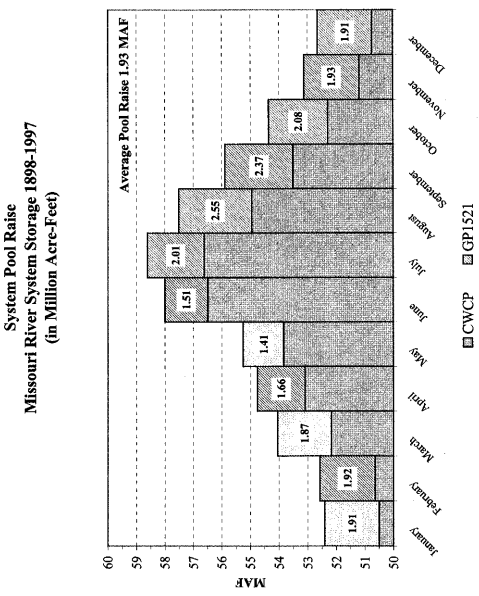
This shift in water has harmful effects that reach far beyond the obvious problems it creates for navigation, water supply, thermal power plant cooling, flood control, and other open river benefits. It also deprives the ecosystem of both the lower Missouri and Mississippi Rivers of water that would normally nourish wetlands, sustain fish and wildlife habitat, and benefit riparian systems all the way to the Gulf of Mexico.

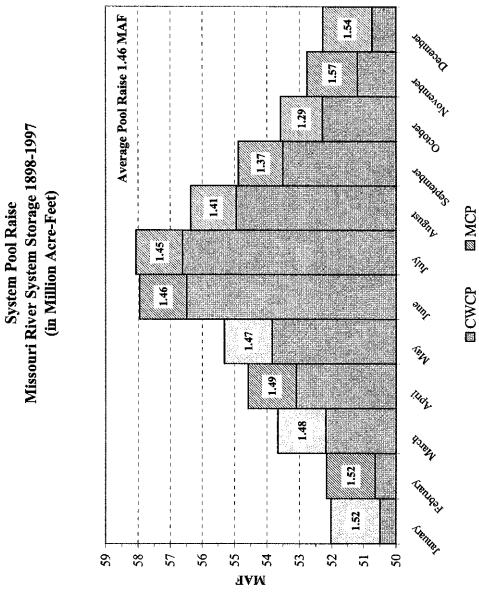
This reallocation of storage runs counter to the Corps stated intent to improve the management of natural systems, restore the health of ecosystems, and generally favor environmental restoration. These "so called drought conservation measures" benefit artificial systems, while depriving the natural systems of water needed for native species. We have seen no documented benefit to the endangered species of holding the reservoirs at consistently higher elevations. In fact, the opposite appears to be true, that these measures are counter to the needs of the endangered species. It is important to distinguish that higher reservoirs are a distinctly separate operation than reservoir unbalancing which could have some endangered species benefits and could be added to any plan.

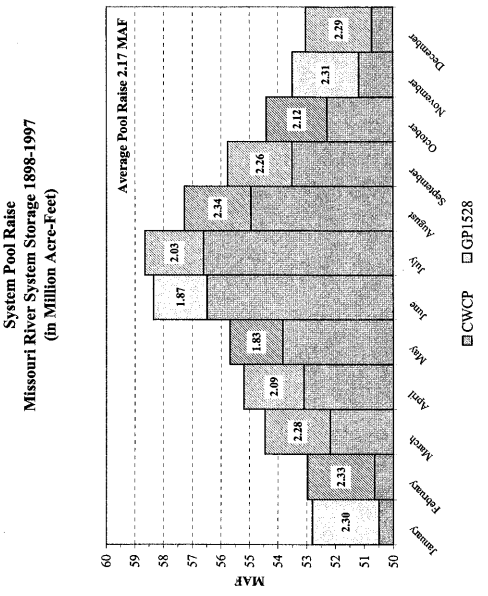
The U.S. Army Corps of Engineers provided the data for the following charts. These charts demonstrate the shift in storage between the Current Water Control Plan and the selected alternatives in the RDEIS. On average, the selected alternatives hold between 1.46 million acre-feet to 2.17 million acre-feet of additional storage. This additional reservoir storage is persistent year to year, not just in drought years. For example, under the Modified Conservation Plan (MCP) the reservoirs are higher than the current plan in 60 to 70 percent of the years. The GP alternatives are consistently higher than the current plan for 56 to 69 percent of the years during spring rise periods and 63 to 93 percent during summer low flow periods. This shift is a direct decrease in the usable storage of the reservoir system to reduce flooding and to sustain usable water.

In effect, this storage shift has removed approximately 2 million acre-feet of storage. This shift not only has the potential to impact availability of water to Missouri during drought but also decreases the amount of storage available to help control floods; adding some additional risk of flooding to the river.

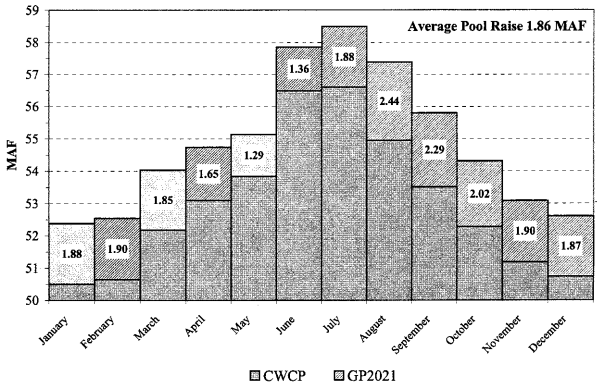

System Pool Raise
Missouri River System Storage 1898-1997
(in Million Acre-Feet)
Average Pool Raise 2.05 MAF
MAF
59
58
57
56
55
54
53
52
51
50
January
February
March
April
May
June
July
August
September
October
November
December
2.21
2.23
2.19
2.02
1.67
2.19
1.86
1.67
2.12
2.00
2.11
2.20
CWCP
GP2028


System Pool Raise
Missouri River System Storage 1898-1997
(in Million Acre-Feet)
Average Pool Raise 1.93 MAF
MAF
60
59
58
57
56
55
54
53
52
51
50
January
February
March
April
May
June
July
August
September
October
November
December
1.91
1.92
1.87
1.66
1.41
1.51
2.01
2.55
2.37
2.08
1.93
1.91
CWCP
GP1521


System Pool Raise
Missouri River System Storage 1898-1997
(in Million Acre-Feet)
Average Pool Raise 1.46 MAF
MAF
59
58
57
56
55
54
53
52
51
50
January
February
March
April
May
June
July
August
September
October
November
December
1.52
1.52
1.48
1.49
1.47
1.46
1.45
1.41
1.37
1.29
1.57
1.54
CWCP
MCP


System Pool Raise
Missouri River System Storage 1898-1997
(in Million Acre-Feet)
Average Pool Raise 2.17 MAF
MAF
60
59
58
57
56
55
54
53
52
51
50
January
February
March
April
May
June
July
August
September
October
November
December
2.30
2.33
2.28
2.09
1.83
1.87
2.03
2.34
2.26
2.12
2.31
2.29
CWCP
GP1528

System Pool Raise
Missouri River System Storage 1898-1997
(in Million Acre-Feet)



Percent of Years that the Average Annual Reservoir Storage is Held Higher than Current Water Control Plan

End of Month	MCP	GP1528	GP2028	GP1521	GP2021
January	69%	86%	81%	88%	90%
February	70%	87%	84%	91%	91%
March	60%	84%	84%	90%	89%
April	60%	71%	70%	76%	75%
May	62%	64%	58%	65%	62%
June	61%	62%	56%	69%	65%
July	65%	70%	63%	85%	83%
August	61%	84%	79%	93%	90%
September	65%	85%	82%	93%	91%
October	66%	87%	84%	92%	94%
November	67%	84%	78%	88%	88%
December	68%	87%	82%	88%	90%

* Note RDEIS alternative storage data from U.S. Army Corps of Engineers
http://www.nwd-mr.usace.army.mil/mmanual/rdeis-files.html

"Water Conservation Measures:" a Misleading Phrase

In the RDEIS process the term "water conservation measure" or "drought conservation measure" has been used to describe the reservoir storage triggers that reduce releases. This leaves the impression that somehow water is being conserved. Below the reservoirs, the timing of water released is of key importance. In essence, the "water conservation measures" reduce water support downstream during a drought; thereby shifting storage to the reservoirs. Then in times of "excess," the water is released.

Another common misconception is that since these are "drought conservation measures" they rarely impact operations. In actuality, the measures are imposed a great deal of the time (approximately 40 percent of the years under Modified Conservation Plan). Along with this there is the perception that the shift in storage or higher reservoirs rarely occur. This is also not substantiated in the data. Over the 100-year period, on average, system storage under the Modified Conservation Plan is approximately 1.5 MAF higher than the Current Water Control Plan.

Problems with Mississippi River Navigation Impacts Analysis

Because of problems with the Mississippi River navigation impacts analysis, it is not a good predictor of impacts to waterborne commerce. The Corps is engaged in additional studies to address some of these problems, but they are unavailable.

The stage discharge relationship on the Mississippi River has changed since the impact model was developed. In the RDEIS impacts to shallow water draft occurs when the stage falls below +2 on the St. Louis gage (Volume 13 page 5). The RDEIS equates +2 feet to 90,000 cfs. Using the current USGS rating (Rating 13) for the gage at St. Louis, +2 feet occurs at a flow of 94,950 cfs. According to the RDEIS navigation halts at a stage below –4.5 feet at St. Louis, or 44,000 cfs. According to the USGS rating –4.5 feet equates to a discharge of 53,600 cfs.

According to the St. Louis District of the Corps, the stage discharge relationship of the Mississippi River is transient depending on several factors. For example, during a drought, dredging can greatly influence this relationship. They noted that during the drought of the late1980s that for a given stage (i.e. 90,000 cfs) the stage varied several feet.

Because of the difficulty in predicting stage, the Corps performed a sensitivity analysis. (Note: this analysis was not provided in the RDEIS and results are from a Previous Plan ("PP")) One foot was added to each stage estimate (daily model output). Economic impacts to shallow draft navigation were estimated using these adjusted data. One foot was then subtracted from the model output and economic impacts were again estimated. The results of these analyses were then compared with the basic model output (without stage adjustments). A summary of the sensitivity analysis is attached.

In comparing the CWCP and the "PP", the impacts (costs) to Mississippi River shallow draft navigation are about the same (approximately $45.2 million per year). Whether one foot was added or one foot was subtracted from the stage, the CWCP had lower impacts than the "PP"; the CWCP had $2.6 million lower costs with one foot added and $6.2 million less with one foot subtracted. The range between adding one foot and subtracting one foot was approximately $18.5 million to $92.5 million per year for the CWCP and $21.2 million to $98.7 million per year for the "PP". By changing the stage discharge relationship, well within the Corps ability to predict stage, the relative difference between plans changes. Also, the margin of error, or range of impacts (more than $74 million in this case) greatly outweighs the difference between plans.

The modeling problems related to stage appears to underestimate the low water impacts. The sensitivity analysis further brings into question the results of the impacts analysis on the Mississippi River. To adequately evaluate the impacts of Missouri River management changes on the Mississippi River, a different type of analysis is needed. The current analysis does not do an adequate comparison.

Mississippi River
Average Annual Lost Efficiency Costs
Sensitivity Analysis for Margin of Error (Stage +/- 1 foot)

(Base Run)

CWCP (+1ft)	**Previous Plan (+1ft)**
$18,498,134	$21,165,281

CWCP	**Previous Plan**
$45,269,273	$45,233,073

CWCP (-1ft)	**Previous Plan (-1ft)**
$92,520,777	$98,682,363

Increased Risk of Low Water on Mississippi River

As discussed in other issue papers, the economic analysis of impacts on the Mississippi River due to operational changes on the Missouri River has a large margin of error and does not do a good job of accurately assessing impacts or discriminating between plans. One way to compare plans with regards to Mississippi River low water impacts is to look at the frequency of flow reductions on the Missouri River and how often those reductions coincide with low water on the Mississippi River.

Substantial flow reductions occur on the Missouri River when Missouri River season length is curtailed. These reductions can amount to approximately 15,000 to 25,000 cfs. According to the RDEIS the Modified Conservation Plan (page 7-173) has 40 season shortenings; 35 seasons that are 7 to 7.5 months in length and 5 seasons that are 0 months in length. In contrast the Current Water Control Plan has 9 season shortenings; 8 seasons that are 5.5 to 7 months in length and 1 season that is 0 months in length.

Using model data (Q2D files) we examined when Missouri River season shortenings coincide with low water on the Mississippi River. According to the RDEIS (Volume 13, Appendix F, page 5) restrictions to navigation occur when the stage at St. Louis falls below +2 feet. Economic impacts may occur when river stages are somewhat higher than this. The results show that cutbacks on the Missouri River coinciding with low water on the Mississippi River is rare (7 out of 100 years). Under the Modified Conservation Plan, cutbacks in releases from the Missouri River coincide with low water on the Mississippi River much more often (30 out of 100 years). This data indicates that the Mississippi River would likely be impacted by a change to the Modified Conservation Plan. Also listed is the number of days that low water on the Mississippi River coincides with substantial cutbacks in releases for the Missouri River reservoirs.

Mississippi River Impacts

Plan	No nav	Shortened	Total	MR_2 Years	MR_2 Days
CWCP	1	8	9	7	397
MCP	5	35	40	30	1032

Notes:

No Nav = Number of years without support on Missouri River

Shortened = Number of years with less than 8 month support on Missouri River

MR2 Years = Number of years when No Nav and Shortened coincide with Mississippi River low water (Stage<2 feet)

MR2 Days = Number of days when No Nav and Shortened coincide with Mississippi River low water (Stage<2 feet)

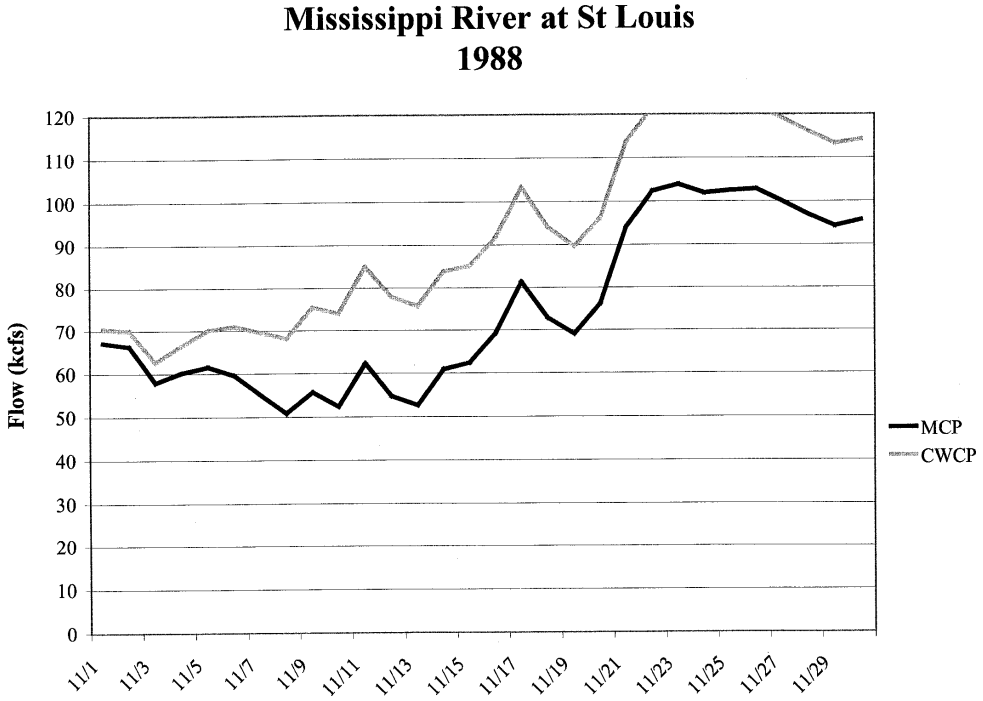
St. Louis flow data from Corps Q2D files

Navigation support data from Corps NVY files

Stage/Discharge conversion from U.S.G.S. Rating 13

The following table summarized the 40 years of season shortenings (including non-navigation years). Season length is presented in months for the Modified Conservation Plan and the Current Water Control Plan. The number of days that flow at St Louis was experiencing low-water conditions (defined as +2 feet or 94,950 cfs, USGS Raging 13) for years with season reductions were tallied. This shows the number of days that a cutback in Missouri River reservoir releases would have impacted the Mississippi River. The data shows that by far the Modified Conservation Plan increases the frequency (risk) of impacting the Mississippi River. Hydrographs for these years also show the potential impacts from season shortenings on the Missouri River. To illustrate the difference, hydrographs for recent low water years of 1988 and 1989 are attached (Corps modeled 1898-1997). Data for these plots were extracted from the Corps flow files (Q2D) downloaded from the Corps web site.

If the Modified Conservation Plan were in place, it would have impacted low water on the Mississippi River as recently as November 2000 and 2001. Using USGS historic daily data, we computed what actually occurred under the Current Master Manual with our estimate of flow under the Modified Conservation Plan. Hydrographs for these years are also attached.

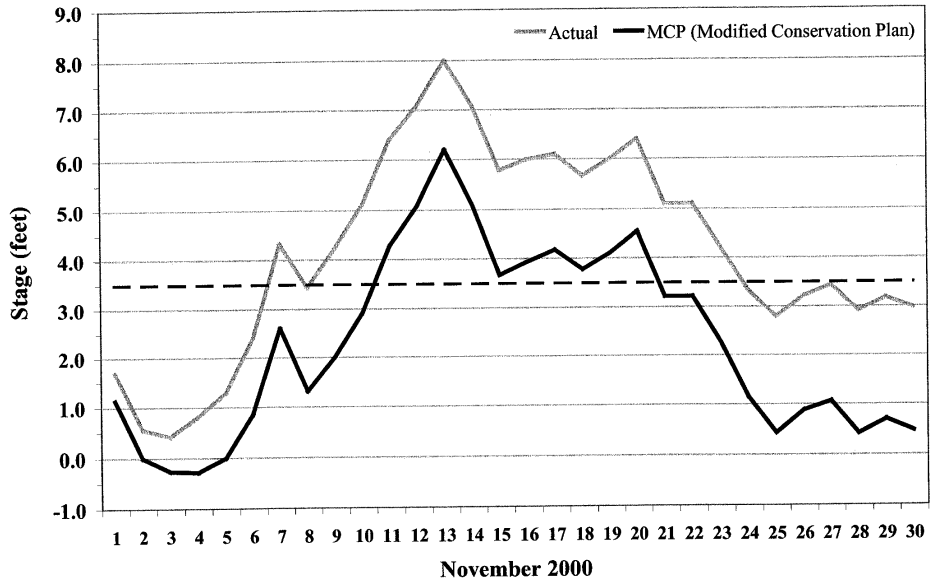


Analysis of Missouri River Season Reduction
Coinciding with Mississippi River Low Flow

Year	MCP Season Length (mo)	CWCP Season Length (mo)	MCP Number of Low Water Days	CWCP Number of Low Water Days
1903	7.2	8.0	1	Seas. not cut
1911	7.1	8.0	0	Seas. not cut
1919	7.1	8.0	0	Seas. not cut
1930	7.1	8.0	26	Seas. not cut
1931	7.1	8.0	13	Seas. not cut
1932	7.1	8.0	26	Seas. not cut
1933	7.1	8.0	26	Seas. not cut
1934	7.1	6.9	16	24
1935	0.0	5.7	69	50
1936	0.0	5.5	144	57
1937	0.0	0.0	129	137
1938	7.1	5.8	3	29
1939	7.1	6.3	26	22
1940	0.0	5.5	156	78
1941	0.0	5.5	61	0
1942	7.1	6.4	0	0
1943	7.1	8.0	24	Seas. not cut
1944	7.1	8.0	26	Seas. not cut
1946	7.1	8.0	0	Seas. not cut
1954	7.1	8.0	21	Seas. not cut
1955	7.1	8.0	26	Seas. not cut
1956	7.1	8.0	26	Seas. not cut
1957	7.1	8.0	20	Seas. not cut
1958	7.1	8.0	16	Seas. not cut
1959	7.1	8.0	7	Seas. not cut
1960	7.1	8.0	18	Seas. not cut
1961	7.1	8.0	0	Seas. not cut
1962	7.1	8.0	26	Seas. not cut
1963	7.1	8.0	26	Seas. not cut
1964	7.1	8.0	26	Seas. not cut
1977	7.1	8.0	1	Seas. not cut
1980	7.1	8.0	22	Seas. not cut
1981	7.1	8.0	0	Seas. not cut
1985	7.1	8.0	0	Seas. not cut
1988	7.1	8.0	17	Seas. not cut
1989	7.1	8.0	24	Seas. not cut
1990	7.1	8.0	10	Seas. not cut
1991	7.1	8.0	0	Seas. not cut
1992	7.1	8.0	0	Seas. not cut
1993	7.1	8.0	0	Seas. not cut
Total low water days during season cut:			1032	397
Total years impacted during season cut			30	7

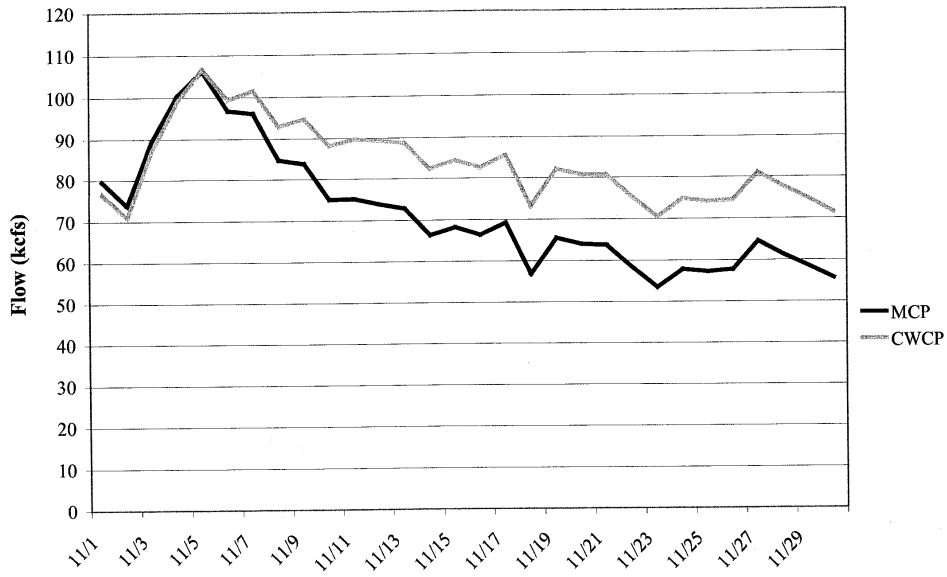
Low water in this analysis is defined as < 94.95 kcfs=+2 feet (USGS Rating 13)

November 2000 Stage Comparison
Mississippi River at St. Louis, Missouri



---- Navigation restrictions may be imposed below +3.5 feet stage.
Note: Actual stages from USGS gage data, MCP stages were calculated based on operating criteria in RDEIS

Mississippi River at St Louis
1989



Proposed Plan Shifts Water from Missouri

One of the primary purposes of the Missouri River Main Stem System is navigation. A full navigation season lasts for eight months (April-November). At Sioux City, full service flow is 31,000 cfs and at Kansas City, the full service flow is 41,000 cfs. The Current Water Control Plan was compared with the five new plans with regards to reductions in service and season length (based on Corps modeled data-Q2D files). The amount of water less than full service, crudely defined here as "usable water", was calculated for each plan.

The following table summarized the volume of water (in million acre-feet) below what would provide full service for eight months at Sioux City and Kansas City, over the 100-year modeled period (1898-1997). The amount of "usable water" was also calculated for Kansas City with future depletions (0.8 to 3.2 MAF). All of the five new plans (Modified Conservation Plan and the four Gavins Point flow plans) greatly reduce the amount of "usable water" for navigation. It should be noted that average annual reduction in useable water is not presented in this paper, because it could be misleading in that the reductions in navigation service do not occur in each year.

Decrease in "Usable Water" Sioux City (MAF per 100 years)

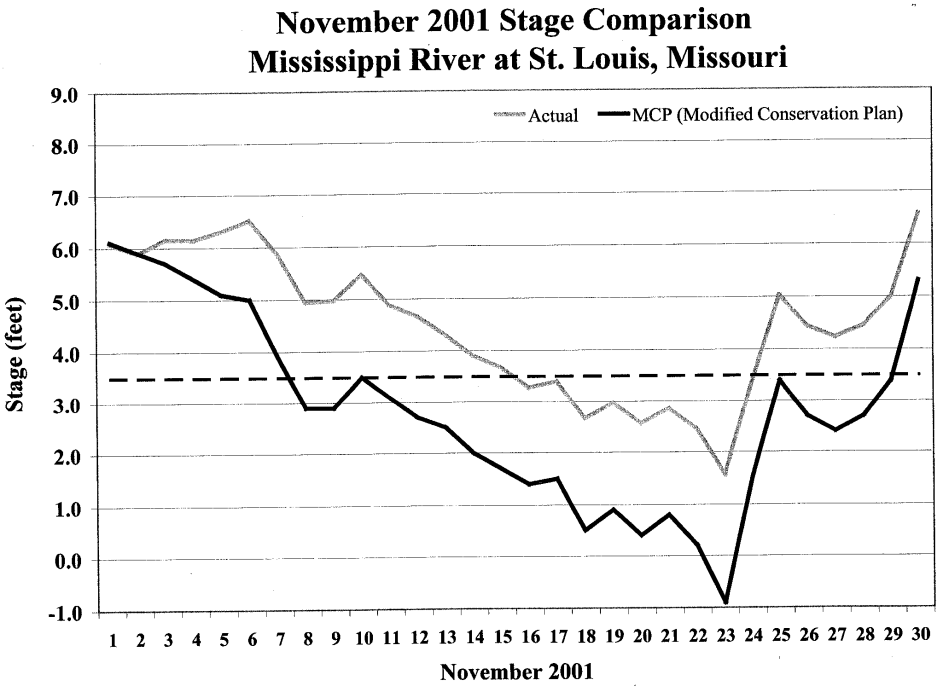
	CWCP	MCP	GP1528	GP2021	GP2028	GP1521
	68.8	94.8	106.4	132.3	107.9	131.3
Compared to CWCP		26.1	37.6	63.5	39.1	62.5

Based on COE modeled daily flow at Sioux City, March 23 to November 22

Decrease in "Usable Water" at Kansas City (MAF per 100 years)

	CWCP	MCP	GP1528	GP2021	GP2028	GP1521
	105.6	130.2	143.1	150.1	143.5	150.1
Compared to CWCP		24.6	37.6	44.5	38.0	44.5

Based on COE modeled daily flow at Kansas City, March 27 to November 26



---- Navigation restrictions may be imposed below +3.5 feet stage.
Note: Actual stages from USGS gage data, MCP stages were calculated based on operating criteria in RDEIS

Increased Risk of Flooding from Spring Rise

In response to the U.S. Fish and Wildlife Service recommendations, the Corps of Engineers (Corps) has proposed four new plans for the management of the Missouri River that include an artificial increase in flow releases from Gavins Point Dam for 30 days between May 1 and June 15 ("spring rise"). Two of the proposed new plans include a flow increase of 15,000 cubic feet per second (cfs) above full navigation flows and the other two include an increase of 20,000 cfs.

During average flow conditions, a 20,000 cfs spring rise would increase the river stage by 2.1 to 3.6 feet at various locations along the Missouri River. The greatest stage increase would occur at the upper most Missouri gauges, decreasing as you approach the Mississippi River. A 20,000 cfs rise on the Mississippi River at St. Louis, Missouri and Chester, Illinois would increase the river stage during average flow conditions by approximately 1.5 feet. Higher stages during spring will have an adverse impact on bottomland farmers. The higher flows would increase the risk of flooding, cause higher groundwater levels, and impede interior drainage throughout the lower basin. In addition, additional spring releases could potentially compound the effects of large rainfall events downstream of Gavins Point Dam.

The proposed May 1 to June 15 spring rise will increase the risk of flooding on both the Missouri and Mississippi Rivers by adding water over current releases during periods of high precipitation and tributary inflow. Due to the several day travel time from Gavins Point Dam to various locations in Missouri, the rise would still have to make its way out of the system even if the spring rise was cut back due to flood targets (see table for travel times). During flood flows, a rise of 15,000 cfs would increase Missouri River stages between 1.1 to 1.7 feet and on the Mississippi River at St. Louis, Missouri and at Chester, Illinois the stage would increase 0.6 and 0.7 feet. (A 20,000 cfs rise would increase Missouri River stages by 1.4 to 2.1 feet and would increase the Mississippi River by 0.8 and 0.9 feet at St. Louis, Missouri and Chester, Illinois.)

Targets for when a Reduction in Spring Rise Will Occur

Location	Current Flood Targets	+15 kcfs Flood Targets	+20 kcfs Flood Targets
Omaha	41 kcfs	56 kcfs	61 kcfs
Nebraska City	47 kcfs	62 kcfs	67 kcfs
Kansas City	71 kcfs	86 kcfs	91 kcfs

Note: When flow exceeds flood target, releases are reduced either to full service or flood target amount, whichever is less of a reduction in release.

Decrease in "Usable Water at Kansas City

Difference From Current Water Control Plan

Future Depletions	Million Acre-Feet per 100-years	
Million Acre-Feet per year	GP1528	GP2021
0	37.5	44.5
0.8	41.8	50.7
1.6	45.7	49.9
2.4	42.4	46.6
3.2	52.0	54.8

Based on COE modeled daily flow at Kansas City, March 27 to November 26

Spring Rise Impacts to Agricultural Lands

In response to the U.S. Fish and Wildlife Service recommendations, the Corps of Engineers (Corps) has proposed four new plans for the management of the Missouri River that include an artificial increase in flow releases from Gavins Point Dam for 30 days between May 1 and June 15 ("spring rise"). Two of the proposed new plans include a flow increase of 15,000 cubic feet per second (cfs) above full navigation flows and the other two include an increase of 20,000 cfs.

During average flows, a rise of 15,000 cfs would increase the river stage at St. Joseph, Missouri by 2.8 feet and a rise of 20,000 cfs would increase the river stage by 3.6 feet. A 'spring rise' will have an adverse impact on bottomland farmers. The higher flows would increase the risk of flooding, cause higher groundwater levels, and impede interior drainage throughout the lower basin. In addition, these additional spring releases could potentially compound the effects of large rainfall events downstream of Gavins Point Dam. During flood flows, a rise of 15,000 cfs would increase the river stage at St. Joseph, Missouri by 1.6 feet and a rise of 20,000 cfs would increase the river stage by 2.1 feet.

We disagree with the Corps statement in the Summary RDEIS that the impacts to flood control are insignificant (RDEIS Summary page 14).

Missouri River bottom farmers are accustomed to dealing with wet fields and spring floods in most years. However, much of the flooding they experience is high water for a few days and then back down. This allows levied lands to drain by gravity through gated outlets. When river stages are high for extended periods of time, fields do not drain and the amount of pumping is increased to remove interior water. With a four-foot increase in the river stage (RDEIS summary) gravity drainage outlets would be blocked. Outlets that are inoperable for 30 days will significantly increase groundwater and interior drainage problems for the bottomland farmers.

The Corps' flood damage analysis shows a relatively small increase ($4.9 million) in average annual flood damages between the CWCP and GP2028. However, the analysis does not breakdown damages by floodplain uses nor does it account for damages to agricultural lands from impeded drainage or excess groundwater. Since agricultural levees are constructed to provide a lesser level of flood protection, one would surmise that agricultural lands would be impacted greater than residential or commercial properties. The flood damage analysis also does not include interior or groundwater damages to the lower basin. Instead the Corps analyzed six representative levee districts for interior drainage impacts and four districts for groundwater damages. These damage analyses were not projected to depict basin-wide impacts nor were they included in the National Economic Develop (NED) account. However, these representative analyses do show that the higher spring flows found in all of the GP plans increase both interior drainage and groundwater damages by as much as 10 percent. If these increases in damages were to be expanded to all of the lower river floodplain and included in the flood control benefit analysis, it is apparent that the CWCP would have significantly more flood control benefits than any of the proposed GP plans.

Stage Rise from a +15 kcfs Spring Rise (in Feet)

Location	Long Term Annual Average Flow	Flood Stage
Missouri River		
St. Joseph, Missouri	+ 2.8	+ 1.7
Kansas City, Missouri	+ 2.8	+ 1.1
Waverly, Missouri	+ 2.1	+ 1.5
Boonville, Missouri	+ 1.7	+ 1.2
Hermann, Missouri	+ 1.6	+ 1.1
Mississippi River		
St. Louis, Missouri	+ 1.3	+ 0.7
Chester Ill. (near Perryville, Mo.)	+ 1.1	+ 0.7

Stage Rise from a +20 kcfs Spring Rise (in Feet)

Location	Long Term Annual Average Flow	Flood Stage
Missouri River		
St. Joseph, Missouri	+ 3.6	+ 2.1
Kansas City, Missouri	+ 3.7	+ 1.5
Waverly, Missouri	+ 2.7	+ 1.9
Boonville, Missouri	+ 2.3	+ 1.4
Hermann, Missouri	+ 2.1	+ 1.4
Mississippi River		
St. Louis, Missouri	+ 1.7	+ 0.9
Chester Ill. (near Perryville, Mo.)	+ 1.5	+ 0.9

In conclusion, prior to any decision being made that would increase spring flows below Gavins Point Dam, the total impacts to the bottomland farming community must be fully considered.

Targets for when a Reduction in Spring Rise Will Occur

Location	Current Flood Targets	+15 kcfs Flood Targets	+20 kcfs Flood Targets
Omaha	41 kcfs	56 kcfs	61 kcfs
Nebraska City	47 kcfs	62 kcfs	67 kcfs
Kansas City	71 kcfs	86 kcfs	91 kcfs

Note: When flow exceeds flood target, releases are reduced either to full service or flood target amount, whichever is less of a reduction in release.

Stage Rise from a +15 kcfs Spring Rise (in Feet)

Location	Long Term Annual Average Flow	Flood Stage
Missouri River		
St. Joseph, Missouri	+ 2.8	+ 1.7
Kansas City, Missouri	+ 2.8	+ 1.1
Waverly, Missouri	+ 2.1	+ 1.5
Boonville, Missouri	+ 1.7	+ 1.2
Hermann, Missouri	+ 1.6	+ 1.1
Mississippi River		
St. Louis, Missouri	+ 1.2	+ 0.6
Chester Ill. (near Perryville, Mo.)	+ 1.1	+ 0.7

Stage Rise from a +20 kcfs Spring Rise (in Feet)

Location	Long Term Annual Average Flow	Flood Stage
Missouri River		
St. Joseph, Missouri	+ 3.6	+ 2.1
Kansas City, Missouri	+ 3.7	+ 1.5
Waverly, Missouri	+ 2.7	+ 1.9
Boonville, Missouri	+ 2.3	+ 1.4
Hermann, Missouri	+ 2.1	+ 1.4
Mississippi River		
St. Louis, Missouri	+ 1.6	+ 0.8
Chester Ill. (near Perryville, Mo.)	+ 1.5	+ 0.9

Spring Rise and Pallid Sturgeon

One of the most contentious issues surrounding the revision of the Master Manual for managing the Missouri River is the proposed artificial spring rise. The increase in flows is purportedly necessary to provide a spawning cue for the pallid sturgeon, a rare and endangered fish, and re-connect the river with the floodplain. The pallid sturgeon has historically been found in larger river systems such as the Missouri, Mississippi, Arkansas, Red, and Atchafalaya and possibly never existed in very great numbers. The U.S. Fish and Wildlife Service listed the pallid sturgeon as an endangered species in 1990. During Endangered Species Act consultation with the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service recommended an increase in flows of 15,000 to 20,000 cubic feet per second (cfs) below Gavins Point Dam during the month of May, to avoid jeopardizing the continued existence of the pallid sturgeon. This recommendation was included in the U.S Fish and Wildlife Service's Biological Opinion on the operation of the Missouri River Main Stem Reservoir System (USFWS 2001. Final Biological Opinion on the Missouri River Main Stem Reservoir System, Operation and Maintenance of the Missouri River Bank Stabilization and Navigation Project, and Operation of the Kansas River Reservoir System).

The Biological Opinion states that the proposed spring rise "would" trigger spawning activity in the pallid sturgeon and other native fishes and reconnect potential riverine and floodplain habitats. However, an analysis of the proposed flow changes by the state of Missouri and the United States Army Corps of Engineers has shown that the recommended spring rise provides very little additional connectivity between the river and the floodplain. Since the Missouri River below the confluence with the Platte River already provides a spring rise, the artificial release from Gavins Point Dam at best would add a spawning cue to approximately 200 miles of river. It is widely accepted within the scientific community that there are many unknowns regarding the life requirements of the pallid sturgeon especially what is needed for a successful spawning. Factors other than a lack of flow pulse may be contributing to the decline of the species, such as food availability (e.g. benthic invertebrates, habitat, etc.) (National Academy of Sciences, 2002. *Missouri River Ecosystem: Exploring the Prospects for Recovery.*).

The proposed 15,000 to 20,000 cfs spring rise below Gavins Point Dam approximately thirty-three percent of the time will only increase water levels by approximately two feet above those experienced with normal releases. This reach may not have been channelized but the river below Gavins Point is deeply incised. The proposed spring rise (15,000 or 20,000 cfs) is well below levels needed for substantial re-connectivity with the floodplain (MDNR 2001 Comments on the 2001 Draft Biological Opinion). The reservoir releases creating a spring rise are to occur only when the Missouri River main stem reservoirs contain storage in excess of 54.5 Million acre-feet (MAF) on May 15. Releases would be curtailed when downstream flood targets (plus spring rise amount) are exceeded at Omaha, Nebraska City, or Kansas City. Therefore this operation would be limited to non-drought years in the upper basin and limited by downstream flooding.

Since there are so many assumptions or unknowns about the successful reproduction and recruitment of pallid sturgeon, to put so much emphasis on such a small segment of the historical range, approximately 200 miles form Gavins Point to the Platte River, does not seem to be a reasonable and prudent plan. The pallid sturgeon's range is approximately 3,500 miles (USFWS 1993. Recovery Plan for the Pallid Sturgeon *(Scaphirhynchus albus)*) of which spring rises already occur over much of this range. For example, there are approximately 1,350 miles of river between Kansas City and New Orleans that currently has a spring rise. The lack of success of pallid sturgeon in this long reach of river indicates that factors other than a lack of a flood pulse may be contributing to the decline of the pallid sturgeon. The factors may include habitat loss and degradation due to channelization and impoundments, commercial harvest of sturgeon, effects of pollution and contaminates, and competition with introduced species.

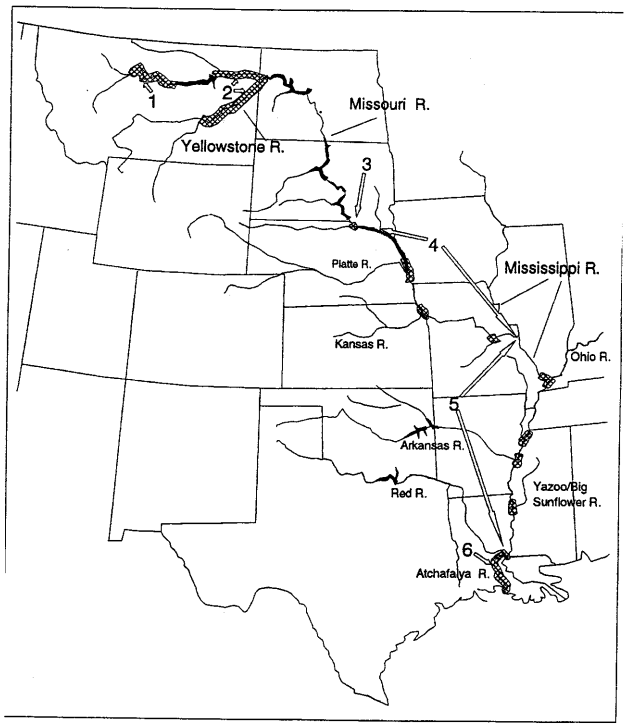


Figure 4. Recovery-priority management areas -

— Reach between Gavins Point Dam and the Platte River, lacking spring rise.

Adapted from: USFWS. 1993. Pallid sturgeon recovery plan. U.S. Fish and Wildlife Service, Bismarck, North Dakota. 55pp.

Limited Gains in Least Tern and Piping Plover Habitat

The U.S. Army Corps of Engineers estimates the amount of tern and plover habitat for each of the plans. These results are reported in average annual acres.

The tern and plover habitat estimate for the Current Water Control Plan (CWCP) is 221 acres.

Reservoir unbalancing is an operation that shifts water within the three largest reservoirs (Ft. Peck, Sakakawea, and Oahe). This operation is included in all five of the new plans (including GP2021). This operation could be added to any plan including the Current Water Control Plan. If it were added to the Current Water Control Plan, the Corps' estimates that 58 acres of tern and plover habitat would be gained (personal communication Roy McAllister). Therefore, by adding reservoir unbalancing to the Current Water Control Plan, there would be 279 acres of tern and plover habitat.

Gavins Point 2021 (GP2021) provides the most tern and plover habitat of any of the five new plans. The Corps' estimate of tern and plover habitat for GP2021 is 385 acres. This is only 106 acres more than the Current Water Control Plan with unbalancing added.

Below Gavins Point dam, the Corps reports that GP2021 would provide 77 acres, while the Current Water Control Plan would provide 40 acres; 37 acres less than GP2021.

The RDEIS does not estimate acreage of tern and plover habitat around the reservoirs even though surveys indicate that both terns and plovers utilize shoreline habitat (survey attached). This is a substantial omission since over 55 percent of the adult plover and approximately 24 percent of the adult interior least terns reside around the reservoirs on average over the past five years. Both the U.S. Fish and Wildlife Service and the Army Corps of Engineers recognize the value of the habitat around the reservoirs especially during periods of reservoir draw-down or drought. The Fish and Wildlife Service state in their 2000 Biological Opinion, *"that reservoir habitats provide a vital resource for the birds,* (Interior Least Tern and Piping Plover) *especially during periods of substantial pool fluctuation as have occurred since the mid-1990's"*(FWS 2000, Biological Opinion, page 246).

Since the writing of the 2000 Biological Opinion, the final rule for critical habitat for the northern great plains breeding population of piping plover is being developed. The Fish and Wildlife Service in their proposal has currently designated large areas around the main-stem reservoirs as critical habitat for this federally threatened bird. The Corps proposal for higher and more stable reservoirs could negatively affected this critical habitat, which has not been addressed in the RDEIS. It would show an amazing lack of foresight and planning if the Corps, after over a decade of revising the Master Manual, would choose a Preferred Alternative which would have a substantial negative impact on this critical habitat.

Since the RDEIS does not address tern and plover habitat around the reservoirs, we used the Corps estimates on wetland and riparian habitat relative to the reservoirs to get a feel of what the affect might be on tern and plover habitat if it would have been analyzed. In comparing the GP2021 plan with the MCP plan, 300 acres of riparian habitat is lost and 1,000 acres of wetland

habitat are lost in the reservoir deltas. This 1,300 acre lost habitat estimate does not include the entire system, it is based on 42 representative sites (RDEIS page 7-35 & 7-38). It should also be noted that GP2021 provides 3,100 less acres of wetland and riparian habitat in the reservoir deltas than the Current Water Control Plan.

Total Acres of Tern and Plover Habitat

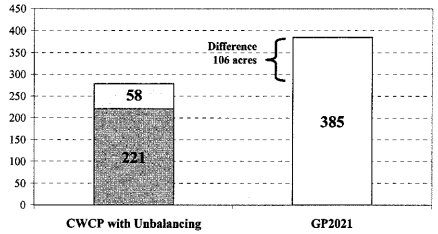


Table 7.6-1. Average annual tern and plover habitat downstream of mainstem dams (acres).

	1898 to 1997				
Alternative	**Total**	**Fort Peck**	**Garrison**	**Fort Randall**	**Gavins Point**
CWCP	**220.5**	50.3	97.9	32.7	39.5
MCP	**315.6**	81.3	152.1	38.7	43.4
GP1528	**356.4**	28.7	205.0	52.4	70.3
GP2021	**384.7**	35.4	207.8	64.6	76.9
GP1521	**370.0**	36.0	193.5	66.4	74.0
GP2028	**353.1**	27.4	201.5	53.3	70.9

Table 7.5-1. Average annual wetland habitat (thousands of acres).[1/]

	1898 to 1997			
Alternative	**Total**	**Lake Deltas**	**Upper River**	**Lower River**
CWCP	**156.1**	35.1	44.2	76.8
MCP	**157.4**	33.1	47.2	77.1
GP1528	**157.5**	30.5	47.5	79.6
GP2021	**158.4**	32.6	47.5	78.3
GP1521	**158.5**	32.4	46.7	79.3
GP2028	**158.4**	30.8	47.8	79.9

1/ Based on 42 representative sites.

Table 7.5-3. Average annual riparian habitat (thousands of acres).[1/]

	1898 to 1997			
Alternative	**Total**	**Lake Deltas**	**Upper River**	**Lower River**
CWCP	**108.1**	12.0	41.9	54.1
MCP	**105.8**	11.7	40.2	53.8
GP1528	**103.3**	11.7	39.8	51.8
GP2021	**103.6**	11.4	39.9	52.3
GP1521	**103.9**	11.3	40.2	52.4
GP2028	**102.5**	11.7	39.5	51.3

1/ Based on 42 representative sites.

U.S. Army Corps of Engineers Threatened and Endangered Species Data Management System 2001 Census and Fledge

Missouri River

	Piping Plover			Least Tern		
Reach	Census	Fledged	Fledge Ratio	Census	Fledged	Fledge Ratio
Fort Peck Reservoir	4	2	1	0	0	0
Fort Peck River	3	2	1.33	39	19	0.97
Lake Sakakawea	424	265	1.25	34	13	0.76
Garrison River	149	114	1.53	125	79	1.26
Lake Oahe	184	130	1.41	94	63	1.34
Fort Randall River	38	14	0.74	71	5	0.14
Lewis and Clark Lake	34	12	0.71	58	34	1.17
Gavins Point River	218	202	1.85	232	127	1.09
Total	1054	741	1.41	653	340	1.04

Proposed Gavins Point Flow Plans Do Not Follow the "Natural Hydrograph"

Some proponents of a split season have claimed a natural hydrograph as an argument to support their position. It is clear from examining the "unregulated flow data, that low flow did not occur during the June through July period. However, this is the timing of the split that has been proposed under the Gavins Point flow plans. These plans also create very high flow in the fall, a pattern that does not exist in the "natural hydrograph".

The RDEIS includes four alternatives with a mid-June through August low flow period among their alternatives selected for detailed analysis. The Corps in the RDEIS seems to parrot the Fish and Wildlife Service rhetoric that these low flows tend to "mimic the natural hydrograph". The RDEIS (pages 2-10 and 2-11) hints that "water conservation" is the primary reason for the reduced service or no service split, not to generate a more natural hydrograph.

"Decreased service levels during the remainder of the navigation season [post spring rise] *were included in the alternatives with spring increases for two reasons. First, in many of the years there is only enough inflow of water into the Mainstem Reservoir System on an annual basis to provide the required water for an 8 month, full service season. Second, native rive fish benefit from this change because the higher flows followed by much lower flows cause the annual flow pattern for the Lower River to more closely mimic the natural hydrograph."*

To illustrate our point that the GP alternatives do NOT resemble or "mimic" the natural hydrograph, we have attached the graphs which compare the long-term daily median flows for the 100-year period of record (1897-1998) for unregulated flows (EVQ2) and each of the proposed spring rise / summer low alternatives (GP alternatives).

Table XII
Missouri River Main Stem
Least Tern and Piping Plover Survey Data

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Fort Peck Lake													
Adults	3	4	6	10	0	7	9	2	0	0	4	0	0
Fledglings/Pair	0	3.00	0	0.40	0	0	0.44	0	0	0	0	0	0
Fort Peck Lake to Lake Sakakawea													
Adults	18	48	92	66	110	31	58	95	138	162	25	40	13
Fledglings/Pair	0.33	0	0.17	0.58	0.25	0.48	1.41	0.99	0.33	0.53	1.52	1.70	0.15
Lake Sakakawea													
Adults	7	15	6	8	20	17	35	7	27	2	23	9	10
Fledglings/Pair	0	0	0	0	0.83	0.12	0	0	0.15	0	1.04	0.67	0.30
Garrison to Lake Oahe													
Adults	142	121	174	195	198	146	217	304	105	41	141	105	105
Fledglings/Pair	0.93	0.43	0.41	0.58	0.48	0.26	0.54	0.91	0.08	0.30	1.52	1.50	1.03
Lake Oahe													
Adults	82	97	100	143	134	125	160	84	74	101	110	57	85
Fledglings/Pair	0	0	0	0	0.42	0	0.06	0	0.24	0.16	1.29	0.88	1.01
Ft. Randall to Niobrara													
Adults	0	4	26	32	13	38	43	10	2	0	61	151	72
Fledglings/Pair	0	0	0.31	0.63	0.46	0	0	0	0	0	0.04	1.03	1.28
Lake Lewis and Clark													
Adults	45	29	63	55	29	76	44	14	38	81	133	76	44
Fledglings/Pair	0.13	0.62	0.35	0	1.39	0.97	0	0	0	1.57	2.33	0.21	0.38
Gavins Point to Ponca													
Adults	252	210	167	193	187	272	211	93	82	115	148	164	149
Fledglings/Pair	0.49	0.55	0.46	0.26	0.21	0.88	0.48	0.40	0.27	0.90	2.27	2.41	1.72
Total Adults	549	538	634	702	690	711	777	591	446	481	635	572	551
Fledglings/Pair	0.59	0.54	0.38	0.41	0.42	0.59	0.41	0.67	0.31	0.66	1.73	1.62	1.22

Interior Least Tern

Ten Year Interior Least Tern Fledge Ratio Goal= 0.70

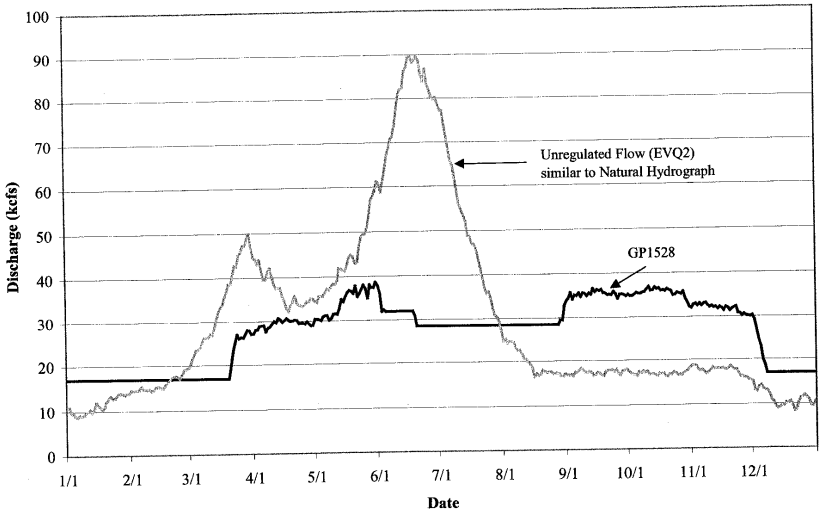
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Piping Plover													
1992	20	12	22	25	26	39	4	5	0	0	0	4	2
1993	1.20	1.50	3.18	1.20	1.00	0.60	1.50	1.20	0	0	0	2.00	0
1994	5	11	17	13	0	4	9	20	34	33	4	5	4
1995	0	0.18	0	0	0	0	0	3.50	1.00	0.87	1.00	0	0
1996	143	57	132	150	108	8	45	34	70	3	119	83	277
1997	0	0	0	0	1.50	8.50	1.24	0	0.57	0.67	1.20	1.25	1.61
1998	113	84	71	124	77	127	119	261	45	6	74	130	99
1999	0.97	0.26	1.04	1.13	1.01	0.54	0.87	0.87	0.09	0	1.84	0.88	1.41
2000	55	140	88	87	141	66	86	30	21	31	98	46	141
2001	0	0	0	0	0.07	0.33	0.09	0.93	0.29	1.20	1.66	0.50	1.45
2002	0	0	0.67	0.48	0.75	0	0	17	0	0	33	51	62
2003	31	18	30	33	6	32	12	4	6	32	84	67	28
2004	0.06	0.56	0.67	0	0	0.06	0.33	0	0	1.25	2.45	0.30	0.5
2005	212	122	148	166	112	109	62	63	22	22	49	141	186
2006	0.62	0.21	0.39	0.35	0.34	1.06	0.61	0.16	0	0	2.20	1.60	2.17
2007	570	444	521	623	480	388	283	497	191	117	465	534	707
2008	0.73	0.33	0.76	0.42	0.94	0.76	0.61	0.84	0.39	0.07	1.61	1.01	1.58

Fifteen Year Piping Plover Fledge Ratio Goal= 1.44

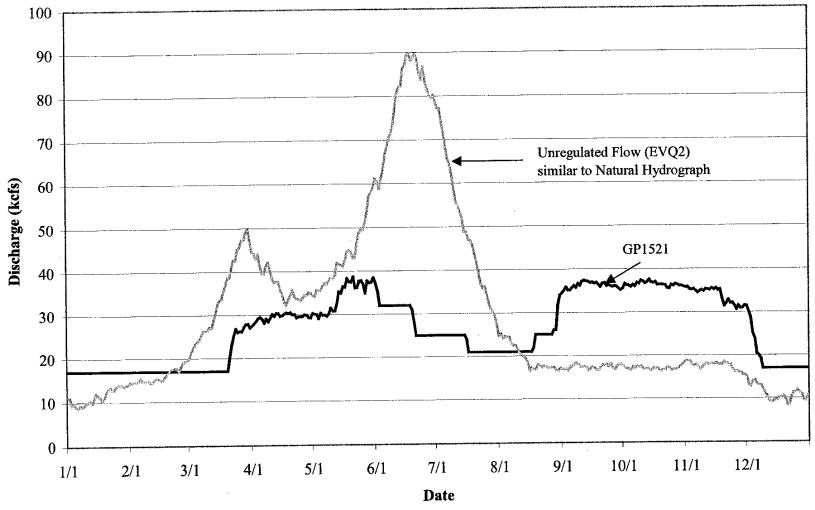
- Data not collected
* Partial Survey Results
(1) No Birds Found
+ Subsampling of Selected Nesting Areas

This data does not include least terns and piping plovers raised in captivity. The data represents only wild fledged birds.

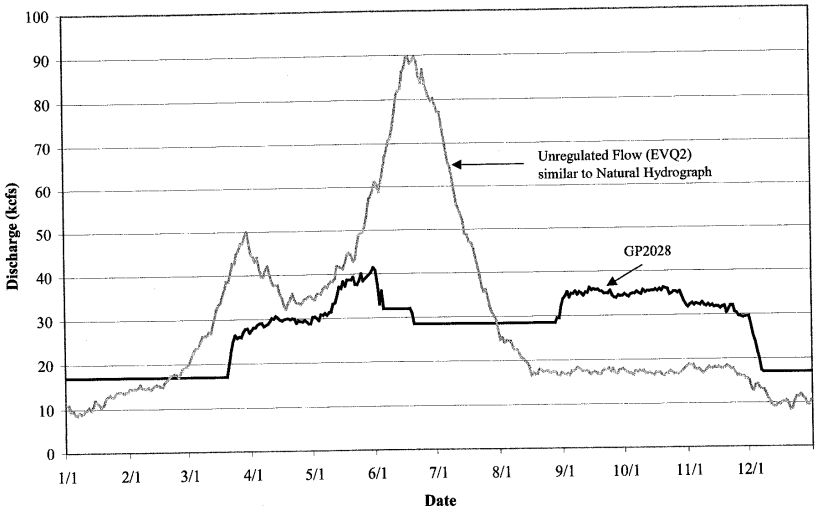
Unregulated Flow versus GP 1528
Missouri River at Gavins Point
Long Term Daily Discharge (1898-1997)



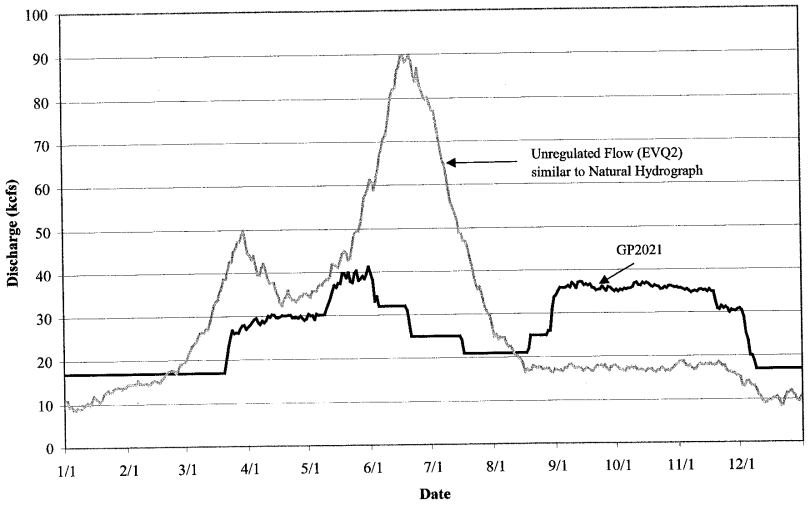
Unregulated Flow versus GP 1521
Missouri River at Gavins Point
Long Term Daily Discharge (1898-1997)



Unregulated Flow versus GP 2028
Missouri River at Gavins Point
Long Term Daily Discharge (1898-1997)



Unregulated Flow versus GP 2021
Missouri River at Gavins Point
Long Term Daily Discharge (1898-1997)



RDEIS Fails to Adequately Analyze Plans for Future Depletions

Supporting studies leading to the development of the current Master Manual were conducted as early as the 1950s. Beginning in 1953, projected annual system operation for the year ahead was developed to make recommendations on system operation for the upcoming year (Corps 1999-2000 Missouri River AOP). The current Master Manual was first published in December of 1960 and was most recently revised in 1979 approximately 23 years ago. At the urging of the upstream states, the Master Manual has been undergoing review for the past 12 years (since November 1989). Given the magnitude, time, and expense of this undertaking it is very unlikely that the Corps will open the Master Manual again for review and update for at least another several decades (i.e. 25-50 years). Therefore, it is imperative to include and plan for reasonably foreseeable future conditions, such as future depletion levels.

According to the RDEIS there have been approximately 13.7 MAF of depletions per year at the mouth. Consumptive use and other sources of depletions continue to grow (see attached chart). The Garrison Diversion alone could add almost one MAF of depletions when it is fully operational and the Northwest water supply project has the capacity to divert (out of basin) approximately 0.3 MAF per year. Thus, it appears that future depletions could easily be 3 MAF during the life of this Master Manual. Any plan under consideration should have been analyzed under these potential conditions.

Incomplete analysis
The RDEIS fails to conduct detailed analysis that included modeling with future depletions for all of the six plans that were presented for detailed analysis. By not including depletion analysis for the Modified Conservation Plan (MCP), the public is not provided with the opportunity to evaluate the effects of future depletions and "drought conservation" measures, limiting their ability to comment. This analysis has been requested repeatedly by the state of Missouri. It should have been included in the RDEIS.

Since "Adaptive Management" is part of all of the proposed new plans, the Gavins Point flow modifications may change over time. The drought conservation measures appear to be fixed over time since the Corps presented a range of Gavins Point flow modifications, but did not present a range of conservation measures.

Fatally flawed depletion analysis; wrong criteria used.
Secondly, the depletion analysis that was provided in the RDEIS is technically flawed. All of the plans include reservoir-operating criteria that are generally considered "drought conservation" measures. These criteria include reservoir system storage checks that trigger an operational measure (such as shortening the navigation season length). The Navigation Preclude is one of these operational measures. According to the RDEIS (page 2-9):

> *"a navigation "preclude" was included in the DRM simulation of all alternatives. Navigation service would not be provided in years that the March 15 storage level was less than the specified storage volume.*

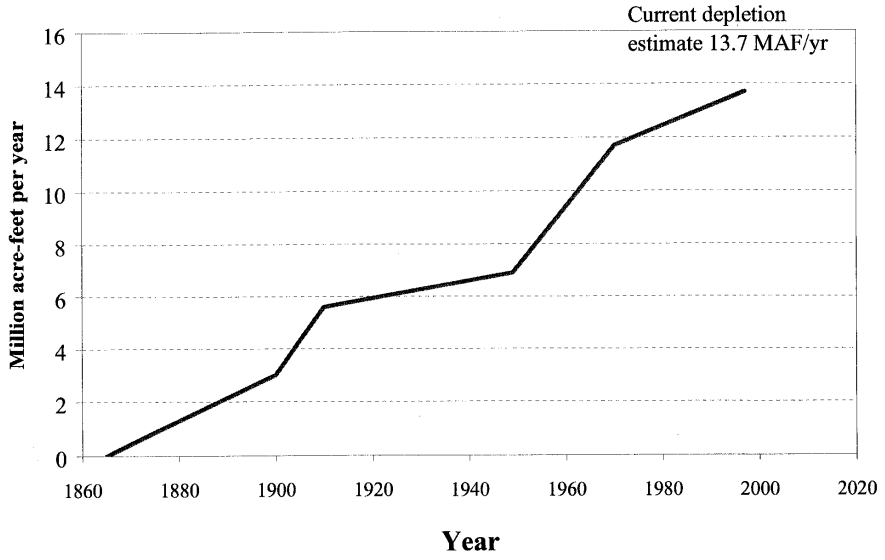
Page 7-173 of the RDEIS indicates that the navigation preclude is 31 MAF. Therefore, if system storage is greater than 31 MAF on March 15 of a given year, navigation service should be provided. From examining Corps data, the model runs that include future depletions have a higher navigation preclude than 31 MAF, cutting off navigation support in years when it should have been supported. This not only affects the navigation analysis it also would affect other analysis (i.e. recreation, hydropower, etc.). The Corps must explain this inconsistency or revise the model analysis and provide the results to the public before selecting a Preferred Alternative.

As an example, GP2021 with 3.2 MAF future depletions, has 18 years with no support to navigation. In 12 of these years, system storage on March 15 was greater than 31 MAF. It appears from the data that the navigation preclude for GP2021 with 3.2 MAF of future depletions is about 40 MAF, not 31 MAF. Attached is a table that lists the no service years and corresponding March storage for this plan. (Note: March 15 system storage data was not provided by the Corps, therefore minimum monthly storage for March was used.)

The consequence of inconsistent navigation precludes is that we do not know the impacts on a particular use or resource, for any given plan with future depletions. Changing the navigation preclude substantially changes the plan.

Missouri River Basin

Depletion Data used by Corps of Engineers



Sources: 1979, COE Master Manual, & 1998 COE, PRDEIS Volume

Navigation Preclude Comparison
GP 2021 with 3.2 MAF of future depletions

No Service Years[1]	Minimum March Storage (kac-ft)[2]
1932	**35,540**
1933	**38,397**
1934	**39,630**
1935	**33,107**
1936	**31,503**
1937	27,908
1938	26,117
1939	30,208
1940	30,719
1941	27,263
1942	28,821
1943	**38,832**
1957	**38,405**
1959	**39,349**
1962	**33,351**
1990	**39,126**
1991	**39,195**
1993	**38,811**

Note: According to RDEIS (page 7-173) navigation support is suspended in years when system storage falls below the navigation preclude level (31,000 kac-ft).

1. Data extracted from M20214.NVY data file, U.S. Army Corps of Engineers
2. Data extracted from M20214.SGM data file, U.S. Army Corps of Engineers

Several Key Technical Studies will be Completed After the RDEIS

There are several key technical studies under way that the Corps has indicated will not be finished until after the RDEIS public comment period is over. These studies are key for the Corps and the public to more accurately evaluate the impacts and assess the benefits of the proposed alternatives. Since these supplemental technical studies will be coming out after the RDEIS comment period is over, this forces the public to comment on what often is outdated, erroneous, and arbitrary results.

The Corps provided a listing of seven technical studies that will be completed after the RDEIS comment period (attached). This does not allow the pubic or agencies to incorporate comments that relate to these studies into the record during the public comment period prior to the Corps selecting a Preferred Alternative. These new analyses could greatly alter the current understanding of impacts. In addition to the attached list, there are other ongoing state and federal studies, which could also provide valuable information in this process. For example the Upper Mississippi River System Flow Frequency Study which is being conducted by the Mississippi Valley Division, Rock Island District to update the discharge frequency relations and water surface elevations for the Mississippi River above Cairo, Illinois and the Missouri River downstream from Gavins Point Dam.

Post-RDEIS Technical Analyses

New Model/Runs	Who is doing Work?	Who Asked for Work?	Why is it being Done?	Description of Work
Tern and Plover - Lakes	Casey Kruse and Bruce Vanderlee	State of Missouri	RDEIS Comment and a large portion of plovers are nesting on bare sand in Sak/Oahe	A model is being developed that tracks bare sand changes as lake levels drop and vegetation eventually grows in bare sand after a set number of years.
Navigation - Missouri River	Tennessee Valley Authority	NWD	To better identify the impacts of summer minimum service and split-season alternatives	TVA is looking at all of the movements of commodities and determining if the movements could continue based on economics of alternative modes.
Navigation - Mississippi River	Tennessee Valley Authority	NWD	To determine if the current MVN analysis accounts for all of the increased costs at low flows on the Mississippi River (influx of movements within the Middle and Lower River reaches)	TVA is looking at the effects of the 1990's Mississippi River flows on the ability to move commodities in and out of three major terminals (St. Louis, Memphis, and Vicksburg).
Navigation - Mississippi River	New Orleans District (MVN)	MVD	To better understand what 1939 means relative to rest of period of analysis	MVN staff is looking at the return frequency the 1939 costs may have as they are dramatically greater than cost in all other years. This analysis will help determine if increased inefficiency costs in all years of depletion runs, etc. are appropriate. Some runs have lower costs in some years even though one would expect flows to be lower in all years with increased depletions.
Dredging - Mississippi River	St. Louis District (MVS)	MVS	To add to the brief analysis (with costs) that was completed for the RDEIS	MVS staff will be looking at each year's stage data to determine the potential dredging costs associated with this more detailed analysis.

Environmental Effects - Middle Mississippi River	St. Louis District (MVS)	MVD and NWD	Chutes - Changed Missouri River flow may conflict with Mississippi River BiOp and not all chutes have been evaluated for effects Other resources may also be affected.	All of the chutes are being evaluated for the six Chapter 7 alternatives, and MVS will be attempting to identify which change (summer or fall) is the more important of the changes among the alternatives. A statistical analysis is being conducted to determine if other resources should be evaluated.
Power at Risk	NWD (Chuck Hillerson under contract)	NWD as discussed with Power Consumer (MECA) group	To determine extent of minimum monthly flows on the amount of thermal capacity and energy that may be at risk.	Current analysis is based on average flow in the mid-July to mid-August timeframe. Another analysis will be done on the minimum flows in the same timeframe.

The RDEIS Fails to Analyze Each Component Proposed in the Alternatives Selected for Detailed Analysis

The alternatives that the Corps has selected for detailed analysis have several new components, which are not a part of the Current Water Control Plan. These components include: 1) drought conservation measures, 2) reservoir unbalancing, 3) Ft. Peck spring rise, 4) Gavins Point spring rise, 5) Gavins Point summer low flow and 6) non-navigation releases. Also needed are the margin of error or other descriptors of the accuracy and precision of the results.

In order for the public to adequately assess the environmental, social, and economic impacts of these plans each component or change needs to be evaluated individually and each combination of components needs to be analyzed. In addition, the results need to include sensitivity or margin of error analysis that would help the public understand the significance of the results. This analysis is necessary for gaining an understanding of how each component affects the environmental or economic benefits and damages. The affects of the interrelations of these components are largely unknown by both the Corps and the general public. The interrelation of these components could have a positive, negative, additive or even a synergistic affect on the desired outcome. This analysis could help in optimizing the benefits for both the endangered species and the authorized uses of the system. It would also aid in identifying components that cause a high degree of damages with minimal gain so that other more effective changes could be made.

In order for the Corps to fully assess the proposed changes an analysis of components and a combination of components are necessary. This analysis is necessary to fully assess the impacts caused by the proposed changes.

Plan Criteria Not Well Defined

The RDEIS does not clearly define the specific criteria of a spring rise. Consequently, it is difficult to determine if the impacts of the spring rise, if adopted in a new Master Manual, have been adequately evaluated.

The Gavins Point plans reportedly include either a 15,000 cfs or 20,000 cfs spring rise above full service (RDEIS pages 6-3). *Under the GP Options, Gavins Point Dam spring rise is attempted every year. Two factors were allowed to limit the years in which spring rises would occur. First Gavins Point Dam releases to Lower River are limited when flood control constraints (see Chapter 2) are exceeded....* The second factor that limits a spring rise, which was omitted in the RDEIS, is when System Storage falls below 54.5 million acre-feet on March 15 (personal communication Roy McAllister/ Mike Swenson). *The spring rise would occur on an average of once every three years between May 1 and June 15, as conditions allow* (RDEIS Summary, page 11, REDIS page 6-2).

The only mention of the duration of the spring rise in the RDEIS was that the spring rise was *modeled as running for four weeks* (RDEIS page 6-2), however this is not apparent examining the data. The spring rise in the Biological Opinion is two weeks with flows ramping up and down on either side of the rise (FWS Biological Opinion, page 234).

The Corps did not seem to achieve the stated frequency for a spring rise, once every three years or 33 percent. Flow data (Q2D files) were queried to determine over the 100-year period modeled, how often Gavins Point flows exceeded 15,000 cfs or 20,000 cfs over full service flows, for 14 consecutive days, during the May 1 to June 15 period. For the 15,000 cfs rise alternatives, GP1528 and GP1521 achieved the rise (described above) in 23 out of the 100-years. For the 20,000 cfs rise alternatives, GP2028 achieved the rise in 18-years and GP2021 achieved it in 19-years out of 100-years.

In contrast the Kansas City reach satisfies the 20,000 cfs rise criteria from tributary inflow in 50-years out of 100-years (20,000 cfs over full service, for 14 consecutive days, May 1 to June 15). The Kansas City reach achieves the 15,000 cfs rise criteria in 55-years out of 100-years. This is well in excess of the one out of three average as recommended by the Fish and Wildlife Service.

The RDEIS fails to clearly link the spring rise criteria, the evaluation of impacts, and the determination of success. Will a rise occur every year, one year in two, one in three, one in five, or every year? What is the duration or magnitude of the rise? Will this create a condition from mid- May to mid-June where bottomland farmers experience higher water due to spring rise in some years and higher water in others because of downstream inflow and flood targets being exceeded?

Shortfall in Meeting Kansas City Navigation Target

Gavins Point dam releases are designed to meet navigation targets at downstream locations. Kansas City is the only navigation target location in Missouri. A flow of 41,000 cfs represents full-service navigation and 35,000 cfs represents minimum-service. All of the plans that received detailed analysis have a period of fixed releases for various reasons. The Current Water Control Plan and the Modified Conservation Plan have fixed releases mid-May through late August and Gavins Point flow plans have a fixed release from late-June through August. The basic premise is that during the fixed release period, reservoir releases are set high enough to meet downstream targets in most situations.

Analysis of the Current Water Control Plan, the Modified Conservation Plan, Gavins Point GP1528 and Gavins Point GP2028 indicates that there is a problem (either in the models or the operating criteria). The problem entails many days and major flow discrepancies. The Kansas City target is missed a large percentage of the time (approximately 25 to 30 percent of the time). When targets are not met, they are deficient by a large amount (averages approximately 5,000 cfs). To illustrate missing the target, a plot of the flow data for one year (1970) has been included.

Current Water Control Plan and Modified Conservation Plan were analyzed during the July-August part of the fixed flow period (May 10 to August 20). Service levels were determined using the navigation data files (NVY). July 6 to August 25 were analyzed at Kansas City, allowing 5-day travel time from Gavins Point to Kansas City. Each daily flow was compared to the service level (35,000 to 41,000 cfs). Shortfalls were tallied. Since there are not navigation targets in non-navigation years, those years were excluded from the analysis.

The Gavins Point Flow Plans GP1528 and GP2028 have a fixed release from Gavins Point from June 20 through September 1. Allowing for 5-day travel time from Gavins Point to Kansas City, the period of June 25 to September 6 were analyzed for flows less than the minimum service target (35,000 cfs at Kansas City). Shortfalls were tallied. Again, non-navigation years were not included in the analysis. Since GP1521 and GP2021 plans do not support navigation during the low flow period, they were not analyzed.

Missouri River at Kansas City

Analysis of Service Level Targets During Fixed Release Period

(June 25 to September 6)

Includes 94 years with navigation service

(6 non-navigation years not included)

GP2028

Percent of days target not met

26%

Number out of 94-years targets not met

54 years

Average shortfall

4,900 cfs

Percent of days miss target by more than 3,000 cfs

17%

Targets based on Minimum Service Flow (35 kcfs)
Utilizes MR2028.Q2D

Missouri River at Kansas City

Analysis of Service Level Targets During Fixed Release Period

(July 6 to August 25)

Includes 95 years with navigation service

(5 non-navigation years not included)

Modified Conservation Plan

Percent of days target not met

29%

Number out of 99-years targets not met

51 years

Average shortfall

5,100 cfs

Percent of days miss target by more than 3,000 cfs

20%

Targets based on Modified Conservation Plan July 1st Service Level
Kansas City service targets ranged from 35 kcfs to 41 kcfs
Utilized CORP00.Q2D and CORP00.NVY data files

Missouri River at Kansas City

Analysis of Service Level Targets During Fixed Release Period

(July 6 to August 25)

Includes 99 years with navigation service

(1 non-navigation year not included)

Current Water Control Plan

Percent of days target not met

31%

Number out of 99-years targets not met

53 years

Average shortfall

5,300 cfs

Percent of days miss target by more than 3,000 cfs

21%

Targets based on Current Water Control Plan July 1st Service Level Storage Check
Kansas City service targets ranged from 35 kcfs to 41 kcfs
Utilized CWCP00.Q2D and CWCP00.NVY data files

Missouri River at Kansas City

Analysis of Service Level Targets During Fixed Release Period

(June 25 to September 6)

Includes 94 years with navigation service

(6 non-navigation years not included)

GP1528

Percent of days target not met

26%

Number out of 94-years targets not met

53 years

Average shortfall

4,900 cfs

Percent of days miss target by more than 3,000 cfs

17%

Targets based on Minimum Service Flow (35 kcfs)
Utilizes MR1528.Q2D

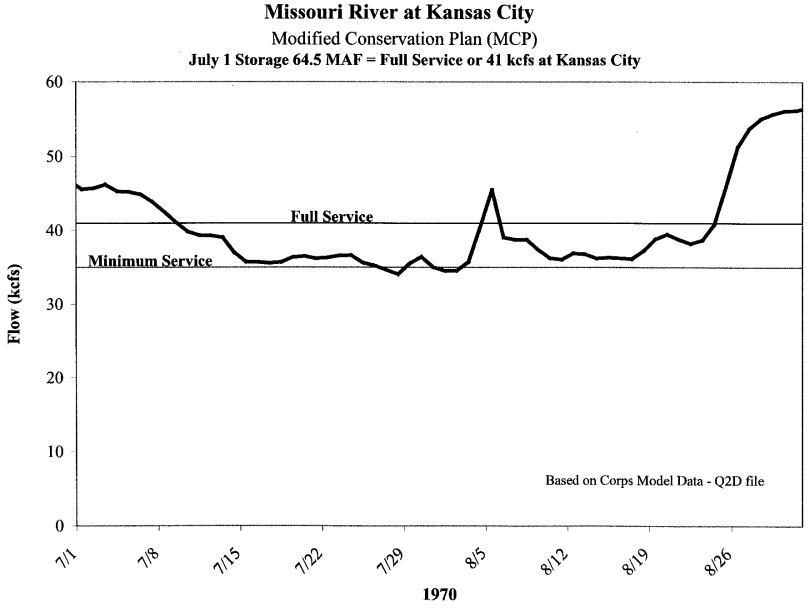
National Economic Development (NED) Analysis is Incomplete and Misleading

The average annual NED benefits data presented in the Total NED Economics section and summarized in Table 7.13-1 is very misleading. The section only presents a portion of the total economic benefits, evaluates economic resource values differently across uses, and does not present losses in revenues as a damage or negative impact. To sum the different economic uses provides an erroneous conclusion since each use had a varying degree of accuracy, uses such as navigation presented only a portion of the benefits, and economic impacts such as interior drainage and groundwater were totally omitted.

The information presented in the table indicates that GP1528 produces the highest NED benefits with $15.9 million more in average annual benefits than the Current Water Control Plan (CWCP). The Corps analysis shows that GP1528 has the greatest net economic return mainly due to the amount of hydropower benefits it purportedly generates. The data is misleading in that hydropower NED benefits for all of the GP alternatives did not include loss of revenue to the Western Area Power Administration (WAPA) in the NED calculations. The analysis of hydropower benefits does not reflect potential impacts to the WAPA and its firm customers. The decision that loss of revenues to WAPA are only regional economic impacts and are not to be included as part of the NED calculations is contradictory to the procedures outlined in "Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies" (Principles and Guidelines) for calculating and displaying NED benefits. When compared to the net revenues of the CWCP, the GP alternatives provide from $8.2 million to $29.7 million fewer revenues. If this comparison of potential loss in revenues had been included as part of the NED benefit analysis, it is obvious that the alternatives would have been arrayed differently based on net economic return.

It also is interesting to note that in the RDEIS, the Corps concluded that *"hydropower benefits being highly variable during the entire period of analysis and none of the alternatives performs consistently better or worse than any of the others"* (RDEIS, page 7-145). Based on these conclusions, hydropower benefits should have been omitted from the table.

It is apparent that the NED benefits analysis does not include all of the benefits to navigation on either the Missouri or Mississippi River. The RDEIS does not include water compelled or fuel (air quality) benefits in the NED analysis. In the Corps' 1998 technical report entitled "Economic Studies—Navigation Economics (Revised)" both water compelled and air quality benefits were included in the analysis for the Missouri River. These analyses show that the water compelled benefits on the Missouri River range between $70 million and $200 million annually. The air quality benefits shown in the referenced technical report shows average annual benefits to the CWCP of approximately $1.9 million. This is approximately one million less than was in the original study. The reason cited for reducing the benefits was a new Clean Air regulation for locomotives, which once implemented would reduce nitrogen oxide and particulate matter emissions. However, the costs of reducing locomotive emissions should have been included in the NED benefit analysis. Missouri River impacts to the Mississippi River's water compelled rates or air quality emission standards have not been evaluated.



The RDEIS is not clear on how operation and maintenance (O&M) costs were handled in the NED analysis. As an example, it appears that O&M costs were not included in the economic analysis for recreation but were included for navigation. According to the information presented on page 7-171, O&M costs were deducted from all of the navigation alternatives except the GP alternatives that did not support navigation. However, the referenced technical report (Economic Studies—Navigation Economics) shows that the O&M costs for GP2028 is $5.18 million greater than the O&M costs for the CWCP. It is apparent that there is a discrepancy in the way this information is displayed in Table 7.12-1 since the net difference in NED benefits between the CWCP ($6.97 million) and GP2028 ($5.28) is only $1.69 million.

September System Storage Check Was Not Evaluated/Options Explored

The Missouri River Main Stem Reservoirs and the Master Manual that guides their operation was designed to provide water during droughts. The Carryover Multiple Purpose Zone, ranging from approximately 18 MAF (MAF) to 57 MAF (39 MAF in all) would be drawn upon to provide water during a drought.

Winter flows can be the lowest of the year and problems can be compounded by ice. Public water supplies, power plants, Mississippi River navigation and others can experience problems due to wintertime low water. Under all of the proposed plans selected for detailed analysis, a Gavins Point release of 12,000 cfs has been identified as the minimum winter release.

The Master Manual uses system storage checks on specific dates to guide how much will be released from the Reservoir System (and service level to authorized purposes). Navigation support is determined using March 15 and July 1 system storage. Winter releases are determined by system storage on September 1 of each year. Under the Current Master Manual, as long as the September 1 does not fall below 58 MAF, full service flows are provided in the winter months. It appears from the models that the Modified Conservation Plan and Gavins Point flow plans also use 58 MAF as the September 1 storage trigger. Also in the Corps of Engineers models, full service flows relate to a 17,000 cfs release from Gavins Point dam, December through February. Winter releases are incrementally reduced as September 1 system storage falls below 58 MAF, until minimum winter releases (Gavins Point release of 12,000 cfs) are reached. (The minimum flow storage trigger was not found in the RDEIS and no attempt was made to estimate it from the model data.)

By making 17,000 cfs releases through the winter months, the reservoirs can be drawn down below the March 1 storage goal (57.1 MAF or Base of Annual Flood Control and Multiple Use Zone). Based on Corps data, the Modified Conservation Plan (MCP) had full service releases in 28 years out of 100-years, that resulted in March storage below 57.1 MAF. In 1967 the March 1 storage was approximately 53 MAF, 4 MAF below the storage goal. Reducing releases from 17,000 cfs to 12,000 cfs would retain almost one MAF of additional water in the reservoirs over a 90-day period.

Attached is a table that lists March 1 storage (model output is actually end-of-month system storage for February), September 1 storage (model output is actually end-of-month system storage for August), and annual runoff for the Modified Conservation Plan. Years have been highlighted in bold when September 1 storage is above 58 MAF (17,000 cfs winter release) and March 1 storage is below 57.1 MAF.

For the 2000-2001 Annual Operating Plan, the Corps did not use the September 1 system storage check to trigger winter release operations. Instead, if the forecasted March 1 system storage was below 57.1 MAF, a 12,000 cfs winter release was used. Because of concerns about wintertime low water impacts and lack of information in the RDEIS, it is not apparent whether the September storage trigger should be changed.

Modified Conservation Plan

Year	System Storage (MAF) March 1st	System Storage (MAF) September 1st	Runoff (MAF)	Year	System Storage (MAF) March 1st	System Storage (MAF) September 1st	Runoff (MAF)
1898	56.5	**62.2**	28.1	1948	**56.0**	**63.5**	28.4
1899	**56.1**	**66.6**	32.4	1949	**55.7**	**58.7**	22.7
1900	**56.9**	**60.0**	23.2	1950	**53.4**	**62.7**	29.1
1901	**55.8**	**60.0**	24.6	1951	**57.0**	63.1	29.1
1902	**55.2**	57.5	20.9	1952	57.4	**63.2**	34.1
1903	54.2	58.5	24.6	1953	**56.0**	**61.2**	25.4
1904	57.7	**63.7**	25.5	1954	**55.5**	54.0	19.1
1905	**56.2**	**58.1**	19.8	1955	51.3	50.9	16.3
1906	**53.6**	60.1	28.7	1956	49.5	50.2	19.5
1907	57.3	66.2	34.7	1957	47.4	50.2	22.0
1908	57.9	65.1	32.7	1958	49.4	49.1	17.0
1909	57.6	66.3	34.9	1959	47.1	48.7	19.9
1910	57.1	**60.2**	23.2	1960	47.8	51.1	20.3
1911	**54.2**	56.0	22.7	1961	48.4	44.1	12.5
1912	55.4	64.0	33.6	1962	42.7	53.4	30.2
1913	57.7	63.0	29.5	1963	52.3	55.4	20.4
1914	57.4	61.5	27.9	1964	52.4	**58.3**	23.7
1915	57.7	65.5	32.8	1965	**55.9**	64.7	32.4
1916	58.6	65.5	33.0	1966	57.3	**58.1**	19.7
1917	57.3	65.3	33.3	1967	**52.9**	62.2	31.2
1918	57.3	63.0	26.3	1968	57.5	**59.5**	23.6
1919	57.2	53.8	13.9	1969	**57.0**	63.2	30.1
1920	50.7	**61.6**	29.2	1970	57.5	62.6	27.3
1921	**56.7**	**60.3**	22.8	1971	57.8	62.1	33.1
1922	**55.0**	**60.4**	24.1	1972	57.1	63.3	32.9
1923	**54.5**	61.3	31.1	1973	58.0	57.8	23.1
1924	59.0	62.0	27.1	1974	56.2	**59.9**	25.0
1925	57.5	62.3	26.5	1975	**55.6**	65.3	35.4
1926	57.2	57.5	22.0	1976	58.0	**61.5**	27.8
1927	54.9	65.8	37.0	1977	**55.6**	52.9	16.2
1928	57.6	**63.7**	30.3	1978	51.8	**65.7**	40.6
1929	**56.7**	**61.6**	24.8	1979	**56.9**	**62.7**	29.5
1930	**55.8**	55.5	18.5	1980	56.9	55.8	18.8
1931	53.0	46.7	10.6	1981	54.3	54.8	19.3
1932	42.6	45.8	19.5	1982	52.9	64.1	33.3
1933	42.1	42.2	18.2	1983	58.4	62.5	27.1
1934	38.9	32.7	11.1	1984	58.5	64.1	30.8
1935	28.2	31.8	14.3	1985	57.5	55.8	18.6
1936	30.3	32.1	14.1	1986	55.7	63.9	36.3
1937	30.2	33.3	14.6	1987	58.7	**60.5**	21.3
1938	31.9	34.2	20.6	1988	**55.5**	51.1	12.4
1939	31.5	31.5	17.0	1989	47.6	48.1	17.7
1940	27.2	27.7	12.0	1990	46.4	45.4	16.7
1941	27.4	29.9	16.7	1991	43.4	47.7	22.3
1942	32.6	39.8	25.2	1992	46.2	44.4	16.4
1943	38.6	50.7	31.5	1993	43.2	55.9	36.2
1944	48.2	**58.6**	29.8	1994	56.4	**59.4**	23.9
1945	**56.2**	**58.8**	22.8	1995	**56.0**	65.2	37.2
1946	**53.9**	53.1	20.3	1996	59.5	64.9	35.6
1947	52.8	**61.5**	28.3	1997	59.5	68.4	49.0

Additional Water From Maintaining Adequate Tern and Plover Habitat

The Corps has included an operation, from approximately May 10 to August 20, which is implemented to protect tern and plover nesting in the reach immediately below Gavins Point dam. This operation is present in Corps models of the Current Water Control Plan and the Modified Conservation Plan, as well as actual operations during the 1988-1993 drought, the Corps increased releases from Gavins Point dam when terns and plovers begin to nest in early May. Typically, releases required to meet downstream targets are not as high in May and June as they are in July and August. Releases are increased in order to keep the terns and plovers nesting adequately high on the sandbars so that they are not impacted during releases which the Corps anticipates will be required in July and August.

Based on actual operations this past year, this operation may not be necessary as long as adequate habitat exists. Providing adequate habitat is a long-term recovery goal (which could be accomplished through many means). Suspension of this operation would retain additional water in the reservoirs each year it is implemented, offsetting the need to make cutbacks in releases at other times (i.e. season shortening). The water-savings from suspending this operation should be considered by the Corps in the development of a long-term operational plan.

The following is a quote from the 2001-2002 Annual Operating Plan, U.S. Army Corps of Engineers, December 2001:

> *"Gavins Point. For the Upper Quartile and below scenarios, based on the results of last year's operation, releases will not be increased in May when terns and plovers begin to initiate nesting. The release rate will be based on an assessment of flows needed to support the immediate navigation target. This will result in increased flow during the nesting season. Based on 2001 nesting season results, it is anticipated that sufficient habitat will be available above the release rates to provide for successful nesting thereby saving water in the upstream reservoirs."*

As reported in the 2001-2002 Annual Operating Plan, if there is sufficient tern and plover habitat available, this operation is not necessary. Based on Table II, "Gavins Point Releases Necessary to Meet Navigation Requirements 1950-1996" (Page 5, 2001-2002 Annual Operating Plan, December 2001), May and June release requirements are 3,000 cfs to 5,000 cfs less than July and August requirements. Over a two-month period this translates into approximately 350,000 to 600,000 acre-feet more water retained in the reservoirs. The additional water should help offset the need for cutbacks in releases to the lower river.

Cold Water Fisheries Analysis:
Lake Sakakawea is a Marginal Cold Water Fishery

After construction of Lake Sakakawea, a cold water fishery was established in the reservoir. The volume of cold water fish habitat in these reservoirs was analyzed as part of the RDEIS.

The minimum cold water fish habitat volume available from July through October in the upper three main stem lakes was estimated for each year of the 100-year simulation period. According to the Corps' analytical data, Lake Sakakawea had periods where the cold water habitat was eliminated (Fort Peck and Lake Oahe maintained cold water habitat through this period). The loss of cold water habitat in Lake Sakakawea occurred in both 1961 and 1991 (Corps 1994 RDEIS, Volume 7A: Reservoir Fisheries). During these periods, Lake Sakakawea had average end of June through end of October elevations of 1821 and 1826 ft. msl. for the years 1961 and 1991 respectively. In other words, the cold water fishery in Lake Sakakawea collapses when storage is still in the top 20% or the top 11.4 feet of the carryover multiple use pool.

North Dakota's Governor John Hoeven recognized the marginal condition of the Lake Sakakawea cold water fishery when he testified to General Fastabend this past October at the Missouri River Master Manual Hearing in Bismarck, North Dakota. He stated that, "If the elevation of Lake Sakakawea falls below 1825 during mid to late summer…" it would put the "…sport fishery… in serious jeopardy."

Although the proposed alternatives will reduce the frequency of the problems with Lake Sakakawea's cold water fishery, the new plans are only a temporary fix, because future growth in upstream water depletion will diminish cold water habitat and once again the cold water fishery will regularly be in trouble. The Corps estimates a total of 1.0 million acre-feet (MAF) of future depletion to be attributed to Lake Sakakawea for the Indian Tribal allocations (1994 RDEIS, Volume2, page 17-1). The nearly completed Garrison Diversion will have the capacity to divert (out of basin) approximately 1.0 MAF per year out of Lake Sakakawea. The approved Northwest water supply project has the capacity to divert (out of basin) approximately 0.3 MAF per year out of Lake Sakakawea (Governor Hoeven, June 04, 2001 Press Release).

Examining the depletion runs that the Corps has provided for two alternatives indicate that Lake Sakakawea's cold water fishery will once again be at its current frequency of population crashes at around 0.8 MAF additional depletions. At 1.6 MAF additional depletions the frequency of crashes of the cold water fishery population exceeds that of the current plan. It is very important to note that these results are based on modeling in which the navigation preclude increased with increasing depletions, which would under estimate the frequency of impacts to the cold water fishery (see our navigation preclude comments).

Given these analyses it seems illogical and short-sighted to propose re-regulation of the country's largest reservoir system to benefit a cold water fishery which is doomed to repetitive failure. In a reservoir such as Lake Sakakawea, the Corps needs to decide if it is essential to attempt to maintain water elevations for a non-native cold water fishery to achieve their fish/wildlife project purpose. Instead of operating Lake Sakakawea for cold water fishery, the Corps should use this re-regulation opportunity to enhance other uses and to further benefit the native species. For example, operations could optimize conditions for terns and plovers around Lake Sakakawea and the reach between Garrison Dam and Lake Oahe.

S0400001

BOARD OF
MISSISSIPPI LEVEE COMMISSIONERS
FRED A. BALLARD, JR., PRESIDENT
P. O. BOX 637
GREENVILLE, MISSISSIPPI 38702-0637
(662) 334-4813
(662) 332-6732
FAX # 378-9592
E-MAIL mslevee@tecinfo.com
WEB PAGE www.msleveeboard.com

COMMISSIONERS
JAMES W. HOUSE, JR., BOLIVAR COUNTY
NOTT WHEELER, JR., BOLIVAR COUNTY
FRED A. BALLARD, JR., WASHINGTON COUNTY
JOHNNY ROBINSON, WASHINGTON COUNTY
KENNETH RODGERS, HUMPHREYS COUNTY
ROY NICHOLS, ISSAQUENA COUNTY
LAURANCE CARTER, SHARKEY COUNTY

OFFICERS
JAMES E. WANAMAKER, CHIEF ENGINEER
PETER NIMROD, ASSISTANT ENGINEER
CHARLES S. TINDALL, III, ATTORNEY
JUDY B. ROSS, TREASURER
GINGER MORLINO, SECRETARY
PATRICK BOLLS, MAINTENANCE SUPERINTENDENT
RICK BOYD, ENGINEERING TECHNICIAN

November 27, 2001

U.S. Army Corps of Engineers, Northwestern Division
Attention: Missouri River Master Manual RDEIS
12565 West Center Road
Omaha, NE 68144-3869

Please include the attached statement in the official record being compiled on the proposed changes to the current Master Water Control Plan for the Missouri River.

BOARD OF MISSISSIPPI
LEVEE COMMISSIONERS

James E. Wanamaker, P.E. P.L.S.
Chief Engineer

JEW/gm

F:\WP60\FILES\MEM11-26

STATEMENT
JAMES E. WANAMAKER, CHIEF ENGINEER
BOARD OF MISSISSIPPI LEVEE COMMISSIONERS

MISSOURI RIVER MASTER MANUAL RDEIS

The Board of Mississippi Levee Commissioners was organized in 1865 following the Civil War to construct a system of levees along the Mississippi River. Our sister Levee Board to the North was organized in 1884 and together the two Levee Boards constructed, operated, and maintained a system of levees along the Mississippi River. As history reflects, the Levee Districts did not have the financial resources to provide adequate protection from flood waters originating in 31 States and 2 Provinces of Canada. Following the disastrous Flood of 1927, the Congress passed the Flood Control Act of 1928 acknowledging Federal responsibility to assist in providing protection to the Lower Mississippi Valley from flood waters of 41% of the continental United States.

The Board of Mississippi Levee Commissioners is funded solely from local funds obtained from the counties within their District. These counties are Bolivar, Washington, Issaquena, Sharkey, and parts of Humphreys and Warren counties. The Board of Mississippi Levee Commissioners operates and maintains 176 miles of Mainline Mississippi River Levee, along with 8 miles of the Greenville Harbor Dike and 28 miles of the Yazoo Backwater Levee extending up the west bank of the Yazoo River from the Mississippi River.

The Boards' primary concern regarding changes to the Missouri River Master Water Control Manual would be impacts to high waters along its levee system and to backwater flooding. Until the pumping plant feature of the Yazoo Backwater Project is completed, over 600,000 acres in the South Delta of Mississippi are impacted by flooding. Releases from the Gavins Point Dam takes approximately 3 weeks to reach Vicksburg (also the mouth of the Yazoo River) at the lower end of our District. A review of the proposed spring flood indicate that changes would impact flood stages by +0.1 foot at Vicksburg. The average slope on land in the Mississippi Delta averages a half a foot per mile. With this in mind, a tenth of a foot change in stages could move the water surface of a flood pool an additional 1,000 feet around this entire perimeter. During most high waters, this can amount to an additional 3000-4000 acres of flooded lands. This may seem insignificant to most, but in the Delta 0.1 foot can impact thousands of acres. This 0.1 foot changes perspective to an individual whose home lacks less than an inch to being flooded or whose lively hood depends on that 3000-4000 acres.

FC 8

We must also point out that the Backwater Levees along the Lower Mississippi River are fuse plug levees which the Congressional authorization prohibits being elevated. Again a tenth of a foot could be critical as to whether this levee might be over topped during a flood.

FC 8

The Board has also been informed that the reduced flows during the summer months could lower stages as much as a half a foot along the Lower Mississippi River which would be a major impact to navigation in years such as 1988, 1999, and 2000. It is apparent that the reduced tonnage on the Missouri River during this period of time would negatively impact tonnages of cargo along other reaches of the Mississippi River System expanding economic losses far beyond the Lower Missouri River Area.

Miss 4, 24

It is our understanding that the proposed change to the Master Water Control Plan was initiated by the recreation interest on the lakes on the Upper Missouri River. More recent impacts to endangered species has also become involved in the effort to modify the Master Water Control Plan. In reviewing the desire of the recreational interest on the lakes, we must not forget the primary purpose for constructing the dams on the Missouri River. It is very apparent that the recreational industry could never provide the economic benefits to justify the construction of these dams. Recreation would not be an issue in this area had it not been for the economic benefits obtained from flood control, navigation, and hydropower. These recreational benefits developed on these lakes utilizing the current Master Water Control Plan and will continue to prosper without changes to the Plan.

Rec 3

Information provided at the public meeting in Memphis, Tennessee indicate that the U S Fish & Wildlife Service is relying solely on the management of water levels to provide what they consider to be the required habitat for the sturgeon, plover, and tern. I did not see any review of alternatives for providing habitat other than modifying water releases from the dams. I would ask that the U S Fish & Wildlife Service and the Corps of Engineers consider the construction of artificial habitat. It would appear that sand could be dredged to existing sandbars elevating these areas to mirror the flooded and dry frequencies to provide the vegetation control for bare ground areas utilizing flows from the Current Water Control Plan. It would also appear that secondary channels, artificial pools, etc. could be dredged or created to assist in the spawning of the sturgeon and warm water species.

WRH 4

The Board of Mississippi Levee Commissioners joins with Governor Ronnie Musgrove and the State of Mississippi in opposing any change to the Current Water Control Plan.

11/27/01

S0400002

Melissa Myers, Interim Director
Tammy Gray, Administrative Assistant
Phone: 501-682-1173
Fax: 501-682-1196
Email: melissa.myers@mail.state.ar.us
Website: www.waterways.dina.org

Arkansas Waterways Commission

101 E. Capitol Avenue, Suite 370
Little Rock, Arkansas 72201

...a transportation and economic development agency of the state of Arkansas

October 25, 2001

Brigadier General Carl A. Strock
U.S. Army Corps of Engineers
Northwestern Division Engineer
Attention: Missouri River Master Manual RDEIS
12565 West Center Road
Omaha, NE 68144-3869

Dear Brigadier General Strock:

As the interim director for the Arkansas Waterways Commission, I would like to address Missouri River navigation category of the Missouri River Master Manual Revised Draft Environmental Impact Statement.

Billions of dollars in cargo move through Arkansas from the Mississippi River each year. Indeed, more than 1000 miles of navigable waterways along five rivers are located within the borders of Arkansas. Our Commission feels strongly that navigation interests for all rivers should work together to ensure continued support of navigation. We are proud of the work the Corps of Engineers has done to build and maintain a national navigation system, and we want to ensure the continued effectiveness of our navigation system.

As the Corps stated in the RDEIS summary, commercial barge traffic from Sioux City to St. Louis amounted to 1.5 million tons in 1994. In total, operators of 140 terminals and docks depend on navigation to operate. Agricultural interests depend on the river for reliable, efficient, inexpensive transport of grains. Industry depends on the river to move bulk cargo. As our highways become more congested and world trade increases, waterways remain an ideal route for transportation needs. From the alternatives provided in the RDEIS, the current water control plan remains the most feasible method of operating the Missouri River. River traffic would obviously be adversely affected by a flow regimes that includes a 3.3 to 4.4 foot spring rise and a negative 1.3 to 3 foot summer flow reduction along with higher reservoir levels. The Gavins Point releases will have a 32 to 86 percent negative impact on navigation compared to the current water control plan. The other alternatives may result in a large-scale reduction of navigation on the Missouri River due to decreased reliability. A negative effect of this magnitude on the Missouri River will only add to the Mississippi River bottleneck and cause major disruption in commerce on the Missisippi River.

Nav 1, 12, 23
Miss 5

Congressional actions clearly show a lack of support for a spring rise. A disruption in navigation days on the Missouri River will result in less utilization of the river for navigation. We applaud the Corps' efforts to balance the need for flood control, recreation, hydropower, wildlife resources, and water supply, but ask that the needs for navigation are met through this process.

Sincerely,

Melissa Myers
Interim Director

The mission of the Arkansas Waterways Commission is to develop, promote, and protect the commercially navigable waterways of Arkansas for waterborne transportation and economic development for the welfare of the people of Arkansas.

S0400003

Missouri
Department
of Transportation

MoDOT

Henry Hungerbeeler, Director

105 West Capitol Avenue
P.O. Box 270
Jefferson City, MO 65102
(573) 751-2551
Fax (573) 751-6555
www.modot.state.mo.us

December 17, 2001

U.S. Army Corps of Engineers
Northwestern Division
Attn: MO River Master Manual RDEIS
12565 W. Center Road
Omaha, NE 68144-3869

To Whom It May Concern:

On behalf of the Missouri Department of Transportation, I would like to submit comments on the Revised Draft Environmental Impact Statement for the Missouri River Master Water Control Manual. From the perspective of transportation, we are very concerned about the potential negative impact on navigation that could result from the proposed alternatives. The waterways of Missouri are vital to our transportation system and maintaining their navigational viability is not only a transportation issue but also an economic issue.

In 1999, Missouri shipped and received more than 38.5 million tons of waterborne commodities with a value of more than $4.1 billion. More than 10 million tons moved within the state, mostly aggregates for the construction industry. Coal valued at $155 million accounted for nearly 38% of the commodities arriving in Missouri by water transportation and provided the fuel for numerous utilities throughout Missouri. Other major commodities arriving in Missouri include petroleum products, fertilizers and aluminum ores.

The inland waterways also provide an efficient and economical way for Missouri to export commodities. Missouri farmers depend heavily on the inland waterways to export their grain to the world market. Grain valued at over $966 million accounted for one-third of Missouri's commercial river shipments. Other major commodities exported by Missouri include gravel, sand and Portland cement.

Inland waterways are an integral part of Missouri's intermodal transportation system. Waterborne shipments are generally heavy, bulky, uncontainerized commodities. The transportation cost for bulk shipments per ton-mile is one-third that of rail or truck based on USDOT National Transportation Statistics. A fifteen-barge tow on the river is equivalent to 870 trucks. Agribusiness, the construction industry and all consumers of utilities and petroleum products, from large manufacturers to homeowners, benefit from the economical efficiency of

the barge industry. It is not prudent to contemplate any Missouri River alternative that has a detrimental impact on both waterway transportation and Missouri's economy. Nav 26

Freight tonnage along the Missouri River has grown 4.5 percent since 1989. If current flow volumes are maintained on the river and season length is maintained, freight tonnage carried on the waterways can be expected to increase in the future. Nav 27

Missouri River flow also has a significant impact on Mississippi River navigation. At the confluence of the Missouri and the Mississippi Rivers, seventeen (17) miles north of the City of St. Louis, the Missouri provides a significant amount of the flow that keeps the Mississippi navigable. The volume of tonnage through the Port of the City of St. Louis ranks second in the country for inland ports at 32.7 million tons in 1999. Reduction in flows from the Missouri River has the potential to create multiple problems with port operations including reduced access to shipping facilities, inability to fully load barges, reductions in the size of tows, and an increased need for dredging. These impacts will have a detrimental effect on not only waterway transportation, but on the economy of the State of Missouri. Miss 5

MoDOT would expect the Corps of Engineers to carefully evaluate the transportation impacts of the proposed alternatives, and that any decision would not have a negative impact on transportation. Nav 28, 6

Sincerely,

Henry Hungerbeeler
Director

hh/js-mo

Copy: Steve Mahfood, MDNR

MISSOURI
DEPARTMENT OF TRANSPORTATION
P. O. BOX 270
JEFFERSON CITY, MISSOURI 65102

U.S. Army Corps of Engineers
Northwestern Division
Attn: MO River Master Manual RDEIS
12565 W. Center Road
Omaha, NE 68144-3869

S0400004

Missouri
Department
of Transportation

MoDOT

Henry Hungerbeeler, Director

105 West Capitol Avenue
P.O. Box 270
Jefferson City, MO 65102
(573) 751-2551
Fax (573) 751-6555
www.modot.state.mo.us

February 27, 2002

Brigadier General David A. Fastabend
Commander, Northwest Division
U.S. Army Corps of Engineers
P.O. Box 2870
Portland, OR 97208-2870

Dear General Fastabend:

On behalf of the Missouri Department of Transportation, I would like to submit comments on the Revised Draft Environmental Impact Statement for the Missouri River Master Water Control Manual. From the perspective of transportation, we are very concerned about the potential negative impact on navigation that could result from the proposed alternatives. The waterways of Missouri are vital to our transportation system and maintaining their navigational viability is not only a transportation issue but also an economic issue.

In 1999, Missouri shipped and received more than 38.5 million tons of waterborne commodities with a value of more than $4.1 billion. More than 10 million tons moved within the state, mostly aggregates for the construction industry. Coal valued at $155 million accounted for nearly 38% of the commodities arriving in Missouri by water transportation and provided the fuel for numerous utilities throughout Missouri. Other major commodities arriving in Missouri include petroleum products, fertilizers and aluminum ores.

The inland waterways also provide an efficient and economical way for Missouri to export commodities. Missouri farmers depend heavily on the inland waterways to export their grain to the world market. Grain valued at over $966 million accounted for one-third of Missouri's commercial river shipments. Other major commodities exported by Missouri include gravel, sand and Portland cement.

Inland waterways are an integral part of Missouri's intermodal transportation system. Waterborne shipments are generally heavy, bulky, uncontainerized commodities. The transportation cost for bulk shipments per ton-mile is one-third that of rail or truck based on USDOT National Transportation Statistics. A fifteen-barge tow on the river is equivalent to 870 trucks. Agribusiness, the construction industry and all consumers of utilities and petroleum products, from large manufacturers to homeowners, benefit from the economical efficiency of

the barge industry. It is not prudent to contemplate any Missouri River alternative that has a detrimental impact on both waterway transportation and Missouri's economy.

Freight tonnage along the Missouri River has grown 4.5 percent since 1989. If current flow volumes are maintained on the river and season length is maintained, freight tonnage carried on the waterways can be expected to increase in the future. Each of the proposed alternatives to the Current Water Control Plan would undeniably threaten the long-term viability of navigation on the Missouri River.

In addition, Missouri River flow also has a significant impact on Mississippi River navigation. At the confluence of the Missouri and the Mississippi Rivers, seventeen (17) miles north of the City of St. Louis, the Missouri provides a significant amount of the flow that keeps the Mississippi navigable. The volume of tonnage through the Port of the City of St. Louis ranks second in the country for inland ports at 32.7 million tons in 1999. Reduction in flows from the Missouri River has the potential to create multiple problems with port operations including reduced access to shipping facilities, inability to fully load barges, reductions in the size of tows, and an increased need for dredging.

Miss 4

The so-called "conservation measures" included in all of the new alternatives currently under consideration by the Corps would negatively impact both Missouri and Mississippi River commerce. While the "conservation measures" were proposed to benefit recreation on upstream reservoirs, they would hamper Missouri and Mississippi River commerce by restricting downstream flows more frequently. For example, had the Corps' Modified Conservation Plan (MCP) alternative been in place in the years 2000 and 2001, navigation restrictions would have been imposed in each of those years on both the Missouri and Mississippi Rivers. To adequately avoid these detrimental impacts to the nation's inland waterway system, the Corps must drastically scale back the "conservation measures" proposed.

Miss 4
Nav 6, 28

These impacts will have a detrimental effect on not only waterway transportation, but on the economy of the State of Missouri. MoDOT will expect the Corps of Engineers to carefully evaluate the transportation impacts of the proposed alternatives, and reject any decision would not have a negative impact on transportation.

Sincerely,

Henry Hungerbeeler
Director

hh/js-mo

cc: Norman Y. Mineta, Secretary of Transportation
Mike Parker, Assistant Secretary for Civil Works, Department of the Army

MDOT

S0400005

Mississippi Department of Transportation / P.O. Box 1850 / Jackson, Mississippi 39215-1850 / Telephone (601) 359-7001 / FAX (601) 359-7110

February 22, 2002

Brigadier General David A. Fastabend
Commander, Northwestern Division
US Army Corps of Engineers
12565 W. Center Road
Omaha, Nebraska 68144-3869

Dear General Fastabend:

The Mississippi Department of Transportation respectfully forwards to you the attached Resolution of the Mississippi Transportation Commission, and solicits your support of the Commission's position that additional analysis is needed before the Missouri River Water Control Plan is finalized.

The Mississippi Transportation Commission supports the Missouri Department of Transportation in their request, a copy of which is also attached, that the US Army Corps of Engineers should conduct some additional analysis prior to finalization of the Missouri River Water Control Plan. In particular, the analysis should assess the impact of potential future depletions at reasonable levels from the Missouri River. We believe that the assumption of reasonable future depletions will demonstrate that adverse impacts to navigation on the Mississippi River are understated in the current analyses.

Miss 5

The Commission strongly supports the preservation of the environment and conservation of our natural resources. The Commission also recognizes the vital importance of the continued health of navigation on the inland waterways to the national economy and the Mississippi State economy. Tradeoffs between environmental and navigational interests, while difficult, must be made from a fair and accurate portrayal of the costs and benefits. Failure to include potential future depletions precludes the accurate portrayal of the costs of maintaining navigation on the Mississippi River. Therefore, we believe that the request to reexamine the analysis of the impact of future depletions is reasonable.

Miss 5

We appreciate your attention in this matter, and also appreciate the working relationship that the Mississippi Department of Transportation enjoys with the Corps. If you have any questions or require additional information, please contact me at any time.

Larry L. Brown
Executive Director

Attachment

EXCERPT FROM THE MINUTES OF THE MEETING OF THE
MISSISSIPPI TRANSPORTATION COMMISSION, FEBRUARY 12, 2002

Upon motion duly made with Commissioners Wayne H. Brown, Zack Stewart and Dick Hall each voting yes, under the authority of the Commission, in conformity with and as spread on its minutes, the following resolution is hereby adopted:

A RESOLUTION IN SUPPORT OF THE MISSOURI DEPARTMENT OF TRANSPORTATION CALLING UPON THE CORPS OF ENGINEERS TO RE-EXAMINE CERTAIN ASPECTS OF THE MISSOURI RIVER WATER CONTROL PLAN

WHEREAS, the Mississippi Transportation Commission, recognizing the critical importance of navigation on the Mississippi River to the economy of the State of Mississippi, as well as the national economy; and

WHEREAS, the volume of flow from the Missouri River is critical to the maintenance of adequate depths for navigation in the Mississippi River, especially in the reaches between St. Louis, Missouri, and Cairo, Illinois; and

WHEREAS, the Missouri Department of Transportation and the Missouri Department of Natural Resources have posited that the Corps of Engineers analyses of the Revision of the Missouri River Water Control Plan have failed to adequately address certain issues affecting the future of navigation on the Mississippi River, in that the Corps of Engineers analyses fail to address reasonably anticipated future depletions out of the Missouri River, and the impact of those depletion on the Mississippi River System; and

WHEREAS, the Mississippi Transportation Commission concurs with the position of the Missouri Department of Transportation that the Corps of Engineers should consider future Missouri River depletions, since at least thirteen million acre feet of depletions occurred during the life of the current Missouri River Control Plan, and it is reasonable to consider that additional depletions will continue to occur; and

NOW, THEREFORE, BE IT RESOLVED BY THE MISSISSIPPI TRANSPORTATION COMMISSION, that the Commission supports The Missouri Department of Transportation in requesting that the Corps of Engineers examine the impact on Mississippi River navigation of reasonably expected future depletions of water from the Missouri River System, and hereby authorizes the Executive Director to convey this resolution to the Commander of the Mississippi Valley Division, US Army Corps of Engineers, and to the Assistant Secretary of the Army (Civil Works).

****

STATE OF MISSISSIPPI

COUNTY OF HINDS

I, Linda O. Ferrell, Secretary, Mississippi Transportation Commission, do hereby certify that the above and foregoing is a true and correct copy of an Order of the Mississippi Transportation Commission of record in Minute Book 9, Page 928, of the Official Minutes of said Commission on file in its offices in the City of Jackson, Mississippi. duly adopted on the 12th day of February, A.D., 2002.

Witness my hand and official seal this the 19th day of February A.D., 2002.

Linda O. Ferrell

LINDA O. FERRELL, SECRETARY
TRANSPORTATION COMMISSION
STATE OF MISSISSIPPI

Missouri Department of Transportation

MoDOT

Henry Hungerbeeler, Director

105 West Capitol Avenue
P.O. Box 270
Jefferson City, MO 65102
(573) 751-2551
Fax (573) 751-6555
www.modot.state.mo.us

January 10, 2002

Brigadier General Edwin J. Arnold, Jr.
Commander
Mississippi Valley Division
U.S. Corps of Engineers
P. O. Box 80
Vicksburg, MS 39181-0080

Dear General Arnold:

On March 22, 2001, the Governors of nine Mississippi River states, including Kentucky, Tennessee, Louisiana, Mississippi, Illinois, Arkansas, Wisconsin, Minnesota and Missouri, wrote to President Bush requesting that he direct the U.S. Army Corps of Engineers to analyze all proposed operating alternatives for the Missouri River Master Manual to determine the economic and environmental impacts to the Mississippi River. Specifically, the Governors called on the Corps to include in their analysis reasonably anticipated future depletions out of the Missouri River system and their impacts on the entire Mississippi River system. Unfortunately, no such analysis has been conducted.

At least 13 million acre feet (MAF) of depletions have already occurred on the Missouri River and approximately 3 MAF on the Mississippi above the confluence with the Missouri River. As a result, the Missouri River enters the Mississippi River with less than 80 percent of its natural flows and the Mississippi River flows through the Port of St. Louis with less than 90 percent of its natural pre-European settlement flows. This problem will only become more acute in the future as additional depletions occur.

The Council on Environmental Quality's regulations implementing the National Environmental Policy Act (NEPA) require that reasonably foreseeable future conditions be analyzed as a part of the cumulative impacts of a proposed action (40 C.F.R. Section 1508.7). The recently revived Garrison Diversion project that would transfer water from the Missouri River Basin into the Red River Basin highlights the increasing demand for water in basins adjoining or adjacent to the Missouri River basin. There are other specific proposed projects that would also increase demand within and without the Missouri River basin. In addition, very large quantified and unquantified claims exist on the part of Mni Sose Intertribal Water Rights Coalition, Inc. The Native American tribes assert that it is their right to market water within and without the basin.

440.302.02.100.0001

Therefore, we assert that it is improper to proceed with proposed changes in operations of the Missouri River system without a clear understanding of the impacts of future reasonably anticipated Missouri River depletions on the entire Inland Waterways System.

The current Missouri River Master Manual was completed in 1960 after many years of analysis. It is very reasonable to expect that a new Master Manual, if adopted, will be in place for at least the next thirty, forty or even fifty years. Therefore, it is imperative to our nation that all anticipated social and economic impacts of existing and anticipated depletions on the entire Missouri and Mississippi River systems be considered.

In closing, we take this opportunity to reiterate the standing request for the Corps to conduct a reasonably anticipated future depletion analysis for each alternative currently being considered for management of the Missouri River to determine the impacts of each on the entire Mississippi River system. Subsequent to such an analysis, Mississippi River states should be provided the opportunity for meaningful input. Thank you for your consideration of our request.

Sincerely,

Henry Hungerbeeler, Director
Missouri Department of Transportation

Sincerely,

Stephen Mahfood, Director
Missouri Department of Natural Resources

Copy: The Honorable Paul E. Patton, Governor of Kentucky
The Honorable Don Sundquist, Governor of Tennessee
The Honorable M.J. "Mike" Foster, Jr., Governor of Louisiana
The Honorable Ronnie Musgrove, Governor of Mississippi
The Honorable George H. Ryan, Governor of Illinois
The Honorable Bob Holden, Governor of Missouri
The Honorable Mike Huckabee, Governor of Arkansas
The Honorable Scott McCallum, Governor of Wisconsin
The Honorable Jessie Ventura, Governor of Minnesota

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

(P.O. Box 1850, Jackson, MS 39215-1850)

MDOT

To: Brigadier General David A. Fastabend
Commander, Northwestern Division
US Army Corps of Engineers
12565 W. Center Road
Omaha, Nebraska 68144-3869

☑ FIRST CLASS ☐ FOURTH CLASS

S0400006

North Dakota State Water Commission
900 EAST BOULEVARD AVENUE, DEPT 770 • BISMARCK, NORTH DAKOTA 58505-0850 • 701-328-2750
TDD 701-328-2750 • FAX 701-328-3696 • INTERNET: http://www.swc.state.nd.us/

February 28, 2002

General BG David A. Fastabend
Commander, Northwestern Division
US Army Corps of Engineers
P.O. Box 2870
Portland, OR 97208-2807

Dear General Fastabend:

In addition to the comments provided in the cover letter signed by natural resource agency directors, I have the following technical comments. It should be noted that while some of these comments describe shortcomings of the document, I am not suggesting that additional work is required prior to implementing a new Master Manual that addresses the need for drought conservation measures. The Master Manual review has been under way for over 12 years, and it is clear that change is long overdue.

The impact of the alternatives on key uses is the critical information necessary for decision making. Some of these areas are modeled and presented more accurately than others. For example, the economic numbers appear to be well modeled and presented with the exception of the impacts on hydropower. While the amount of power generated under each alternative and the timing of that generation is well developed, the value of that power is poorly presented and appears to indicate that the modeling may be incomplete. It is explained that power generated in the summer and winter has more value than power generated in the spring. However, the economic numbers provided in the summaries do not take this into account. The explanation of the increased cost to power users as a result of the seasonal value of power is not adequate to allow a complete understanding of the impacts of the alternatives on hydropower.

HPower 11

The impacts on historic properties should be further evaluated. Because only known sites were used, and these sites are generally above the normal pool level of the reservoirs, the historic properties index rewards low pool levels that would actually expose sites. The injunction against lowering Lake Oahe last winter is certainly an indication that this index is flawed.

CR 2,3

The draft EIS also does not take into account the impacts of warm water release over the Fort Peck spillway on the coldwater fish habitat in river reaches. While this should have been included in the draft EIS, it can be monitored during the demonstration period recommended in the cover letter.

Fish 6

We have always understood that the draft EIS includes six alternatives, the current water control plan (CWCP), the modified conservation plan (MCP), and four Gavins Point plans. However, parts of the draft EIS imply that there are three alternatives, the CWCP, the MCP, and a Gavins Point alternative with adaptive management available through the whole range. This should be clarified.

Other 4

While I support adaptive management, it is critical that citizens of the Missouri River basin have a clear understanding of the range of river operations. That is why we agreed with the MRBA recommendation of a ten-year demonstration of adaptive management essentially bracketed by MCP and GP1528. It is also critical that all stakeholders have input to adaptive management decisions.

Other 4,5,6

Table 7.3-1 on page 7-24 states, "Rate of bank erosion in all of the reaches is declining with time. Trends are not indicating that all the banks are stable. Rather, the volume being eroded in one reach will equal the volume being added to the banks in another location." I disagree with a couple of points made in this statement. While the rate of bank erosion has been declining, that is in part due to the number of protection structures that have been constructed eliminating some of the worst bank erosion areas. The statement that the volume eroded is equal to the volume being added to the banks is not true. Very little of the eroded material is added to the banks, the majority of it is added to the delta being formed in each of the reservoirs. The small amount of material being added to the banks is at a low elevation as the water surface rarely, if ever, reaches the top of bank elevation. This results in the formation of sandbars that have a value for fish and wildlife and recreation, but add little if anything to the value of the bank from the landowners perspective.

ErSd 1

Table 7.12-2 is confusing as it shows that GP2021 and GP1521 provide more years of full service navigation than any of the other alternatives even though these alternatives include a split season with no service. The GP1528 and GP2028 are shown as providing minimum service during the lower summer flow period, using that logic GP2021 and GP1521 should show no service in all years. The alternatives should be analyzed consistently.

Nav 29

While the above comments indicate some areas where the draft EIS can be clarified and some areas that will require additional monitoring as adaptive management is implemented, there is no question that the EIS clearly illustrates the need for change in the operation of the Missouri River. The conservation measures proposed by the MRBA and included in the MCP alternative are critical for equitable distribution of benefits throughout the basin. The EIS clearly shows an increase in the National Economic benefits of these conservation measures over the current operations, benefitting not only North Dakota and the Missouri River basin but the entire country. The Master Manual revision must be completed as scheduled and these conservation measures implemented in 2003, if not earlier.

Other 7

S0400007

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
P. O. Box 94245
Baton Rouge, Louisiana 70804-9245

M. J. "MIKE" FOSTER, JR.
GOVERNOR

KAM K. MOVASSAGHI
SECRETARY

November 27, 2001

Colonel David A. Fastabend
Division Engineer
Northwestern Division
U.S. Army Corps of Engineers
12565 West Center Road
Omaha, Nebraska 68144

SUBJECT: Missouri River Master Manual, RDEIS

Dear Colonel Fastabend:

This is to advise you that although this Department has been on record as an interested party to the subject study, it was not until November 14, 2001, that this Department was put on notice that a Workshop and Public Hearing was to be held in New Orleans, Louisiana at the Pontchartrain Hotel on November 15, 2001. The notice received was a fax sent out by the Mississippi Valley Flood Control Association. This Department is charged with representing the State of Louisiana in all matters concerning flood control and navigation. Mr. Curtis Patterson, former Assistant Secretary of the Department, has addressed numerous letters and presented oral statements concerning the negative affects of changing the current Water Control Plan on the Missouri River. It would be useless to repeat all of these statements here. Governor Mike Foster and former Governor Edwin W. Edwards have both expressed their concerns for the suggested changes. From the cursory review that the Department has made, due to the limited time available, it appears that none of these concerns have been adequately addressed.

Miss- 1

It is the opinion of this Department that your scheduling of this "Public Meeting" was not in the best interest of the "Public". The Pontchartrain Hotel is an old line hotel on congested St. Charles Avenue with limited access and inadequate parking facilities. It is not the proper place for a "Public Meeting." A far better facility would be the large meeting room at the New Orleans District Corps of Engineers Headquarters.

Other- 96

In summation, we state that:

(1) The November 14, 2001, Public Meeting was not properly advertised and does not represent the local views adequately,
(2) The Pontchartrain Hotel is not conducive to a Public Meeting,
(3) The Department wishes to reiterate its total opposition to any change in the current Water Control Plan that would have a negative impact on navigation, flood control, water quality and quantity impacts, excessive nitrogen loading, and environmental impacts on the lower Mississippi River.

Miss- 1, 18

AN EQUAL OPPORTUNITY EMPLOYER
A DRUG-FREE W...

Dec. 19. 2001 2:04PM PROGRAMS MANAGEMENT No. 2260 P. 2/3

General BG David A. Fastabend
Page 3
February 28, 2002

The draft EIS also illustrates the need for change to allow the recovery of threatened and endangered species. Unfortunately, it is much more difficult to determine the degree of change necessary to protect these species. The adaptive management discussed in the EIS will allow the impact of the flow changes on these species to be monitored. Therefore, I fully support the recommendations made by the MRBA of a ten-year test program of spring releases from Gavins Point and Fort Peck dams along with low summer releases from Gavins Point.

Other- 61

Sincerely,

Dale L. Frink
State Engineer

c: Larry Cieslik
Rose Hargrave
Richard Opper
ND Congressional Delegation

02.28.02/14:19:25

\\Bengel\PROJECTS\masterman\lowcocom.wpd

S0500001

BOB HOLDEN
GOVERNOR

DEPARTMENT *of* AGRICULTURE
STATE OF MISSOURI
JEFFERSON CITY

Serving, promoting and protecting the agricultural producers, processors and consumers of Missouri's food, fuel and fiber products.

LOWELL MOHLER
DIRECTOR

February 27, 2002

Brigadier General David A. Fastabend
Commander, Northwest Division
U.S. Army Corps of Engineers
P. O. Box 2870
Portland, Oregon 97208-2870

Dear General Fastabend:

As you've clearly heard at the many hearings held over the past months, the challenges of balancing the many uses, and protecting the many natural and economic resources, of the Missouri river is of paramount importance to Missouri, the Midwest and arguably the nation as a whole. Recognition of these consequences is critical in deliberations surrounding changing the river's current management plan. While there is not agreement in all corners on the relative importance of the issues, nor the science that drives many of the opinions, it is clear that this important resource can - and must - be maximized to protect its many uses, be they transportation, recreation, species protection or habitat improvement.

One of the historical uses of the river and its floodplain has been agriculture. Those of us who work the land in the river's basin and use it's water to move product, or as a lever against other modes, gain significant competitive advantage by the river's resource. Changes in the river will have consequences - in some cases dire consequences - for this industry.

Specifically, Missouri agriculture will be affected by any major change in the current flow level or pattern. We believe that significant deviations including additional release of water to create a spring rise, sequestration of water in upper basins during summer and its implications to transportation on both the Missouri and Mississippi Rivers and diversions of water from upper basin areas to areas outside the Missouri system will create a very negative climate for agricultural producers. From an agricultural perspective the following are our major concerns:

Ph. (573) 751-3359 • 1616 Missouri Boulevard • P.O. Box 630 • Jefferson City, MO 65102-0630 • FAX (573) 751-1784 • E-mail: www.mda.state.mo.us

Colonel David A. Fastabend
November 27, 2001
Page -2-

We feel that a properly scheduled meeting at which all interested parties can be notified with adequate time to study the proposed plans, should be held sometime in the future.

Sincerely,

Edmond J. Preau, Jr., P.E.
Acting Assistant Secretary
Public Works and Intermodal Transportation

The Spring Rise

Missouri bottoms already receive a spring rise. It happens every year. Tributary flows down river from Gavin's Point often contribute to water levels topping levees in Missouri. The dangers of flooding will increase dramatically with the incorporation of a programmed spring rise. With water taking approximately 10 days to reach St. Louis the dangers of these annual peaks become ever more present.

FC 8

Spring flooding keeps farmers out of their field during planting season and higher groundwater reduces yields - yields that often make the difference between profit and loss in today's depressed commodity prices. Current proposals incorporation of a spring yield could increase breached levees, areas of non-agricultural flooding, and will contribute to higher groundwater levels, saturation, and inadequate drainage throughout the basin.

GW 2
IntD 1

Scientific evidence provides that habitat improvements expected from additional water in spring can be achieved through other means. In light of the tributary derived rise currently found in the lower stretches of the Missouri Basin, additional rise would likely provide little improvement for riverine species when balanced against the consequences to those whose livelihood is inextricably linked to the management of the basin.

EnSp 5, 17

Water Sequestration and Split Navigation

Navigation of the Missouri river is critical to the health of agriculture in Missouri, and in the entire Midwest. While discussions of changes in the Missouri River Master Manual have centered on the health of the river, its species and those who derive economic and entertainment benefits from it, the issue is of much larger scope. It is clear that the flow, and ability to navigate the Missouri, provides direct benefits to movers of bulk commodities in the system. What is often not taken into consideration is the interdependence of the Mississippi River System on the Missouri, and the significant contribution of water the Missouri provides. It is as simple as this: If care is not taken in the programming of flow at the nexus of the two great rivers, the potential of impact to navigation of the Mississippi between St. Louis and Cairo, Illinois exists. This would force a much larger issue, and potentially much graver.

Miss 4

The Missouri provides a two-fold asset. First, as described above, it offers significant amounts of water for the all-important Mississippi. Second, the Missouri allows not only for transport of goods on its waters, but as a hedge against other modes of transportation. Prices of rail and over the road transportation are linked to the availability of river shipment. If river is eliminated as an option, the cost of shipment will limit options of farmers and movers of bulk commodities within the system and ultimately costs farmers millions of dollars.

Nav 8
Miss 25

As a result, Missouri believes that any acceptable alternative must be water neutral. We continue to oppose any proposals that reduce the amount of water released to downstream states.

Out of Basis Transfer

While seemingly not an issue directly effecting Missouri agriculture, out of basin transfers have long-run pernicious consequences to down river producers and dependents. Missouri, and consequentially Missouri agriculture, unequivocally oppose out of basin transfers. Such transfers constitute economic and ecological threats given the existing demands for water within the basin and the needs of species dependant on the river for their survival. They simply do not belong in discussions of the health and resource management and enhancement of the Missouri.

Other - 89

In conclusion, the decisions made regarding the management of this critical resource will have long-term and wide-ranging impact on the economic and environmental health of Missouri and its neighbors. It is our sincere hope that these critical areas will be taken into consideration during final analysis of alternatives - both within the existing preferred alternatives or within new options.

Sincerely,

Lowell Mohler
Director of Agriculture

LM:sk

State Historical Society of North Dakota
Since 1895

S0600002

28 February 2002

BG David A. Fastabend
Commander, Northwestern Division
US Army Corps of Engineers
PO Box 2870
Portland, OR 97208-2807

Dear General Fastabend:

Our primary concern is that archeological sites are eroding and slumping into the impounded water at an alarming rate along the seemingly ever-widening shoreline (including islands) of the mainstem reservoirs. Previous measures have not been enough and serious resource loss continues. We urge that future plans for management of these reservoirs take this into account and prescribe effective ways to deal with this problem as a priority issue. We would like to see additional work done to stop erosion at key sites and to excavate those portions of sites where erosion control is not possible.

These archeological sites represent over 10,000 years of human occupation. These sites are a nonrenewable resource. Many sites are gone and many more are washing away. Stipulations in the 1994 Programmatic Agreement among the Omaha District and Missouri River Division, U.S. Army Corps of Engineers, the Advisory Council on Historic Preservation, and the State Historic Preservation Officers of Montana, North Dakota, South Dakota and Nebraska regarding the effects of operation and management of the six Missouri River Mainstem Reservoirs as integrated components of the basin-wide comprehensive Missouri Basin Plan have not been carried out. These and others need to be incorporated in the Master Manual.

CR 11

Change in the operation of the Missouri River is essential. The model presented for cultural resources for the alternatives is inadequate. Evaluating the impacts on historic properties based on the model for the alternatives is dubious at best.

CR 12

Thank you for the opportunity to comment and your consideration of the protection of these nonrenewable resources. If you have any questions regarding these comments please feel free to contact Fern Swenson, Director of Historic Preservation Division, at 701-328-3575.

Sincerely,

for Merlan E. Paaverud
State Historic Preservation Officer
(North Dakota)

North Dakota Heritage Center • 612 East Boulevard Avenue, Bismarck, ND 58505-0830 • Phone: 701-328-2666 • Fax: 701-328-3710
Email: histsoc@state.nd.us • Web site: http://www.state.nd.us/hist • TTY: 1-800-366-6888

S0600003

MONTANA HISTORICAL SOCIETY
225 North Roberts ❖ P.O. Box 201201 ❖ Helena, MT 59620-1201
❖ (406) 444-2694 ❖ FAX (406) 444-2696 ❖ www.montanahistoricalsociety.org ❖

Thursday, February 28, 2002

FAXED 2/28/2002 Rick & Rose to @ 402-697-2677

Other 148
Legal 32

Rick Moore
Rose Hargraves
Army COE NW DIV
Missouri River Water Management Division
12565 West Center Road
Omaha NE 68144-3869

RE: Missouri River Master Water Control Manual RDEIS

Dear Mr. Moore and Ms. Hargraves:

Thank you for submitting a copy of the above referenced document for our review. It certainly is an overwhelmingly large and complex document, reflecting the complexity of the issues you face. Our comments however are restricted to the lack of consideration given to Historic Properties. It seems clear in this document that Historic Properties do not faire well in the mix of resource issues analyzed.

Unfortunately for Historic Properties, as a resource class, the lack of information about those resources severely handicaps attempts to analyze adverse effects or other impacts to those resources or properties. The RDEIS tacitly acknowledges this fact by ultimately relying on a concept termed "average site value (Vol. 7H: 11)." We find this concept lacking in many facets but first and foremost believe it undermines the very core and statutory intent of the National Historic Preservation Act and its implementing regulations. All cultural resources are in fact not equal. The National Register and the Criteria of Evaluation are not only based on this statutory recognition, but also provide a means of assessing the various values different cultural resources might reflect.

Further, the concept of average site value when combined with the preceding leap in effect assessment - "Any historic property which is adversely affected, or will potentially be adversely affected by water management under one alternative, is subject to the same kind of effect under all other alternatives examined (Vol. 7H: 11)" is the nexus of our belief that this RDEIS can not meet the requirements of 36CFR800, and possibly not the National Environmental Protection Act in the absence of other regulation or agreement. Under any alternative, irretrievable and irreversible commitments and impacts, including adverse affects, will occur to an unknown number of cultural resources, many of which have not been evaluated for National Register eligibility, and in the vast majority of cases where adverse affects have not been assessed. Beyond the statutory or regulatory failings of this approach, it also results in a failure to provide even baseline information necessary for mundane resource management, effective planning or appropriate mitigation.

STATE HISTORIC PRESERVATION OFFICE ❖ 1410 8th Ave ❖ P.O. Box 201202 ❖ Helena, MT 59620-1202
❖ (406) 444-7715 ❖ FAX (406) 444-6575

In our experience the appropriate means to address the requirements of the NHPA and 36 CFR 800 in undertakings where a decision is made which may have unassessed affects on as of yet unknown historic properties is a Programmatic Agreement which gives the ACHP and Tribes an opportunity to comment on the proposed identification, assessment and treatment of any eligible properties which might subsequently be determined in an adequate management plan.

It is our opinion that the previous COE-ACHP PA (1993-4) is no longer, and has not been, valid. The COE has not, to the best of our knowledge, met any of the requirements of that agreement under section IV. We have no evidence that either the Fort Peck inventory or the HPMP were initiated, completed or submitted as required under the agreement.

Under these circumstances we can not agree that the RDEIS is an adequate document on which to base a Record of Decision, nor is there any indication that the requirements of 36 CFR 800 have been addressed, or that those regulations could be met though the use of this document without an approved PA.

Sincerely,

Stan Wilmoth, Ph.D.
State Archaeologist/Deputy SHPO

CC: Margie Nowick/ACHP

COE MISSOURI RIVER

The Historical Division of the Department of Cultural Affairs

S0600004

STATE HISTORICAL SOCIETY OF IOWA

Where past meets future

Other 148

March 13, 2002

In reply refer to:
R&C#: 010900036

U.S. Army Corps of Engineers
Attn: Missouri River Master Manual RDEIS
Northwestern Division
12565 W Center Road
Omaha, NE 68144-3869

American Gothic House
Eldon

Blood Run NHL
Larchwood

Centennial Building
Iowa City

Matthew Edel Blacksmith Shop
Marshalltown

Abbie Gardner Cabin
Arnolds Park

Iowa Historical Building
Des Moines

Montauk Governor's Home
Union Sunday School
Clermont Museum
Clermont

Plum Grove Governor's Home
Iowa City

Toolesboro Indian Mounds
Toolesboro

Western Historic Trails Center
Council Bluffs

RE: COE – WOODBURY, HARRISON, MILLS, MONONA, POTTAWATTAMIE, AND FREMONT COUNTIES, IOWA – US CORPS OF ENGINEERS NORTHWESTERN DIVISION – SUMMARY MISSOUIR RIVER REVISED DRAFT EIS MASTER WATER CONTROLL MANUAL, REVIEW & UPDATE – ADDITIONAL CORRESPONDENCE – DRAFT EIS

Dear Colleagues,

I have had an opportunity to review sections of the *Missouri River Master Water Control Manual Revised Draft Environmental Impact State August 2001* pertaining to cultural resources and the effects that the Corps' undertaking will have upon them. The majority of discussions centered on impact modeling of known cultural resources located within the basins of the four upper lakes of the Missouri Stem Reservoir System, those being Fort Peck Lake, Lake Sakakawea, Lake Oahe, and Lake Sharpe. All of these are outside of the review jurisdiction of the Iowa State Historic Preservation Office.

Iowa's interest relates to the open river portions of the Missouri River Mainstem Reservoir System between Nebraska and Iowa, which extend from Woodbury County to Mills County. I was unable to locate any modeling information relating to these areas except for statements on pages 5-137 and 7-183, which maintain that,

> "Data concerning historic properties along open river reaches are inadequate for general analysis, but the river reaches are unlikely to measurably influence the index values established for the northernmost lakes."

It seems to me that the Corps has not adequately addressed the entire area of potential effects of this undertaking or the effects that fluctuating release-levels and barge traffic will have on historic properties situated in these downstream areas. We would like additional information. Specifically:

- What known historic properties lie within the Iowa portion of the project area of potential effects, what will be the project effects upon them, and how will those effects be mitigated?
- How does the Corps propose identify and evaluate unknown historic properties in these same areas?

Please forward clarification to me at your earliest convenience. I will also be raising these points during the Corps' partnering meeting in Des Moines scheduled for Friday, March 22.

Feel free to contact me at (515) 281-8744 if you have any questions or if you would like to discuss this further.

Sincerely,

Daniel K. Higginbottom, Archaeologist
Iowa State Historic Preservation Office

IOWA HISTORICAL BUILDING
600 East Locust • Des Moines, Iowa 50319-0290
Phone: (515) 281-6412 • Fax: (515) 242-6498 or (515) 282-0502
www.iowahistory.org