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Iowa, Greg Gelwicks

Some instream flow related activities in Iowa:

State Water Plan 2008- Early in 2008 the Iowa DNR began development of the 2008 Water Plan for Iowa. This is an update of the last comprehensive water planning effort that was completed in the late 1970's. The plan addresses all water topics, ranging from transportation and water recreation to water quality and quantity, and floodplain management. This calendar year, water supply and allocation and floodplain management will be addressed. With additional funding from the Iowa General Assembly, the DNR created a 10-year strategy to better determine the amount of water available for use in subsurface aquifers and rivers. In addition the DNR is reviewing water allocation and conservation policies included in the Code of Iowa and DNR rules to determine if the current law needs to be updated.

Statewide LiDAR Coverage- In 2007, the Iowa DNR began an effort to obtain statewide elevation data using LiDAR (Light Detection and Ranging). The technology is similar to sonar, and produces geo-referenced elevation data with accompanying aerial photographs. Accuracy is ± 8 inches compared to current elevation data which is accurate to ± 5 ft. Data will be made available from a state website at no charge for all Iowans. This data will have many uses including infrastructure planning, watershed modeling, runoff and erosion modeling, floodplain delineation, etc. Data collection is expected to be completed by 2010. A more detailed description of the project is attached.

Kansas, Mark Van Scoyoc

Kansas Instream flow & stream management activities for 2008

The Upper Arkansas River Conservation Reserve Enhancement Program (CREP) is perhaps the most significant program/activity currently being implemented that KDWP is involved with at the moment. The program is attempting to enroll 20,000 acres or eligible irrigated or non-irrigated cropland in 14 to 15 year contracts within the project area. The primary goals of this program are to conserve irrigation water and improve water quality by removing land from agricultural production by terminating water rights connected to the land enrolled in CREP and establish permanent vegetative cover as well as other conservation practices. The overall intent is to enhance the aquifer and boost water supplies to the Arkansas River and hopefully enhance habitat for various land and water species, conserve energy and reduce erosion. As part of this program, the KDWP Stream Survey Program will monitor 5 sites within the project area, annually, for the next 15 years to track the program's progress.

KDWP is also participating in other projects statewide, most notably acquiring grant money that will be applied toward fish passage projects/issues. Of particular interest is the Neosho river basin, which has already removed some low head structures. It is hoped that several more structures will potentially be removed.

The Kansas Water Office has undertaken a project relating to reservoir sustainability within the State, that addresses issues contributing to the premature aging of our federal reservoirs. The

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focus has been on those inputs into our water bodies and what can be done to restore and/or enhance the riparian/buffer zones along rivers and streams flowing into these areas of concern. At this time it is unknown what KDWP's role will be, but we certainly foresee the opportunity to assess and monitor the biological communities in these systems.

Missouri, Del Lobb

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Osage River

The Osage Hydroelectric Project FERC license was issued in 2007. Ongoing project-related activities are installation of a fish exclusion net to prevent entrainment through turbines, upgrading turbines to meet dissolved oxygen standards, assessment of variable minimum flow effects on access to islands for agricultural activities, and conducting a five-year study of the fish community to monitor effects of minimum flows and dissolved oxygen enhancement. We also are working with other agencies to acquire funding for modifying Lock and Dam #1, which is not in operation, to improve fish passage between the Missouri and Osage rivers.

Taum Sauk Pumped-Storage Hydroelectric Project

We continue to participate in FERC relicensing effort and collaborating with the power company and the DNR on evaluating water management protocols. We are conducting habitat measurements and fish sampling to evaluate use of MesoHABSIM and monitoring temperature and dissolved oxygen to aid development of strategies to protect aquatic resources.

Ecological Stream Flow Task Force

This Missouri Department of Conservation Task Force was established to develop a Department policy on instream flows (now termed Ecological Stream Flows). A Task Force working group is evaluating preliminary stream classification results and software developed under a Hydroecological Integrity Assessment Process (HIP) done for Missouri streams. The working group also has been meeting regularly with DNR staff to discuss mutual interests and information needs.

Minnesota, Ian Chisholm

FY 2008, Minnesota's Stream Habitat Program, Division of Ecological Resources

Example activities and involvement

Ongoing program activities;

- long-term (since 1987) fish sampling,
- continued development of fish HSI library
http://files.dnr.state.mn.us/publications/fisheries/special_reports/162.pdf
- statewide mussel survey, host fish research, Mississippi River mussel propagation work,

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- administer capital bonding project monies via coordinated priority list for stream restorations (e.g. Jackson Dam); stream restoration projects, technical consultations (>> e.g., river ecology, monitoring protocols),
- data analysis and journal article preparation (Impacts of ‘rip and run’ dam removal on mussel community in the Kettle River, Minnesota; Spatial and temporal diversity patterns of stream fish in Minnesota)
- web-based Watershed Assessment Tool development, (http://www.dnr.state.mn.us/watershed_tool/index.html)
- training courses (three one-week long courses in a series) on stream geomorphology (Rosgen’s stream classification; stream monitoring and assessment; stream restoration using Natural Channel Design),
- inter-divisional (with Division of Waters) brochure on “Understanding our streams and rivers” ,
- watershed-wide sediment monitoring study on Whitewater River,
- long-term (12 plus years) channel monitoring on Kettle, Whitewater and Root rivers
- continue effort to inform people on benefits of removing Ford Dam at Lock and Dam 1 on Mississippi River in St. Paul, MN

Nebraska, Larry Hutchinson

NEBRASKA GAME AND PARKS COMMISSION (NGPC)

Stream Projects

October 3, 2008

Missouri River

NGPC staff is heavily involved with a variety of Missouri River issues associated with the Corps of Engineers operations of mainstem reservoirs and the navigation channel below Sioux City, Nebraska. The Missouri River Research Program has a staff of approximately 20, most of whom are funded by COE grants to NGPC for specific studies such as monitoring and evaluating mitigations sites within the channelized navigation reach for ecosystem restoration, shallow-water habitat creation within the channelized navigation channel, pallid sturgeon movement through electronic tracking and monitoring for spawning activity, and paddlefish research on the Missouri River and Lewis and Clark Reservoir. Due to implementation of a recovery plan the COE initiated a one component spring rise in the spring of 2006 to simulate in part a more natural hydrograph. There was insufficient water in main-stem storage in 2007 to repeat a spring rise. Next spring (March and May 2009) the first operational bi-model spring rise is anticipated to better simulate a natural hydrograph.

Lower Platte Biological Opinion

In 2007 and continuing through 2008 NGPC initiated developing a state biological opinion (biop) regarding flows of the lower Platte River for state and federal listed pallid sturgeon piping plover, least tern. The basic premise of the opinion is to no more depletions to the lower Platte River hydrograph without causing jeopardy or adverse harm to the species. Research described in NGPC’s Technical Series No. 18 (see below) and a report by Dr. Jim Parham “*Analysis of the lower Platte River from 1954 – 2002*” are key documents in the biop development. An internal staff committee has engaged various parties representing water users to help address

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opportunities and concerns for ongoing water development needs. NGPC is also including the U.S. Fish & Wildlife Service and the Nebraska Department of Natural Resources (Nebraska's surface water regulatory agency) in discussions. The current focus is on developing programmatic biop plans to deal with surface water requests for irrigation and temporary water permits for infrastructure construction (e.g. roads, pipeline pressure testing)

Lower Platte Sturgeon Tech. Series Publication

The Nebraska Game and Parks Commission published "*Ecology and Management of Sturgeon in the lower Platte River, Nebraska*" in the agency's Technical Series No. 18. This report culminated five years of lower Platte River research by Dr. Ed Peters (retired) of the University of Nebraska as Federal Aid in Sport Fish Restoration, Project F-141-R, Nebraska. The publications includes chapters on: methods; ambient river conditions; habitat use, movement and population characteristics of pallid sturgeon; food habits of shovelnose sturgeon; habitat use and population characteristics of chub species; phenology and relative abundance of larval fishes; creel survey; GIS models of habitat type availability, river connectivity and discharge in the lower Platte River; and management recommendation for sturgeon and chub in the lower Platte River.

Platte River Research by University of Nebraska

Dr. Mark Pegg, fisheries professor at the University of Nebraska has two fishery studies on the Platte River contracted by NGPC with Federal Aid in Sport Fish Restorations. One project focuses on channel catfish of the Platte River and the other on sturgeon.

Assessment of Catfish Populations in the Platte River

The purpose of this project is to gain an understanding of catfish population dynamics to facilitate proper sportfish management in the Platte River System. The specific objectives of this project are:

Objective 1: Determine present status of channel catfish and flathead catfish populations in the central and lower Platte River and evaluate gear efficiencies of commonly used catfish collection techniques. This objective includes assessing many of the critical aspects of population dynamics including abundance (Layher and Maughn 1985), survival (Gerhardt and Hubert 1991), as well as age and growth (Buckmeier et al. 2002). Many studies have evaluated gear selectivity and perceived efficiency issues surrounding capture techniques that include variations of trap nets, electrofishing, and angling. However, most of these studies have put an emphasis on size ranges and total numbers of individuals caught rather than estimating how effective the gears are to representatively sample populations. Accurate estimates of channel catfish, flathead catfish, and associated species abundances are critical to make meaningful decisions pertaining to management of the catfish fishery in the Platte River. Sturgeon Management in the Platte River, Nebraska: Implications to a Declining Sportfish Population

The purpose of this project is to gain an understanding of shovelnose sturgeon population dynamics in the Platte River System for proper sportfish management. The specific objective of this project is to:

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Objective 1: Establish shovelnose sturgeon abundance, distribution, and population dynamics data for the Platte River. This objective will include an estimate of shovelnose sturgeon population size using new and existing data for future long-term population trend information, modeling the effects of angler harvest from angler creel survey based harvest data and population dynamics data (e.g., survival, recruitment, growth, etc.), and investigate techniques for effectively catching larval and young-of-year sturgeon in the Platte River. This study will also use Platte River data collected during Segments I-V, concurrent studies (e.g., Platte River Implementation Recovery projects), and data from previous studies (e.g., Peters and Parham 2008) to build habitat availability and use patterns for identification and management of future habitat needs. Finally, this study will begin to evaluate the inter-dependence of Platte River and Missouri River sturgeon populations in collaboration with concurrent work on the Missouri River through mark-recapture and genetics efforts.

Lower Platte Cumulative Impact Study (LPCIS)

The Cumulative Impacts Study (CIS) project, a geographically-based mapping project, seeks to manage and protect the unique and valuable Lower Platte River Corridor ecosystem by collecting and organizing the necessary data and information to evaluate ecosystem and land use changes over time. Future phases of this project will look at developing predictive models and tools for evaluating/predicting the impacts of future activities and projects. To do this, geospatial analysis methods will be employed to assess long-term ecosystem changes and determine the risk and impacts associated with individual large-scale infrastructure and development projects, as well as the combined effect of the many activities in the Lower Platte River Corridor.

The CIS project is multi-faceted in nature, focusing on the interaction of the land, water, and biological communities, and how changes have shaped the ecosystem of the Lower Platte River Corridor. This proposal has the support of, and is coordinated with, federal, state, and local agencies as well as Nebraska Government Organizations in an attempt to provide a regional framework to understand and evaluate the impact of growth, land use, and habitat changes in the river corridor, while protecting the ecological integrity of the area.

The need for a cumulative impact study is based on the recognition that the Lower Platte River is located in the most heavily populated part of Nebraska. The National Environmental Policy Act (NEPA) defines cumulative impact as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, 40 CFR Part 1508.7 It was also recognized that no single community should be responsible for the cumulative impact study but rather that it was better undertaken as the responsibility of the various agencies associated with the basin.

1. Partners – Corps of Engineers (COE), Lower Platte South Natural Resources District (LPSNRD), Lower Platte North Natural Resources District (LPNNRD), Nebraska Game and Parks Commission (NEGPC), Metropolitan Utilities District (MUD),

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Nebraska Department of Roads (DOR), US Fish and Wildlife Service (USF&WS),
US Geological Survey (USGS),

To undertake this task, the Cumulative Impacts Study Working Group was created through a cooperative agreement signed in September of 2003 between the U.S. Army Corps of Engineers and the Nebraska Game and Parks Commission. An interlocal agreement was formed between the NGPC and participants in the study including the Nebraska Department of Roads, 3 Natural Resource Districts – the Lower Platte South NRD, the Lower Platte North NRD, the Papio-Missouri River NRD, and the State Department of Natural Resources (although they are member of LPRCA). Other partners who have joined since then include the Lower Platte River Corridor Alliance, the Nebraska Land Trust, the US Geological Survey, the US Fish and Wildlife Service, Metropolitan Utilities District, and occasional participation by the University of Nebraska. The group has held a series of meetings designed to clarify the goals and parameters of the study.

The group, which consists of a variety of disciplines (including cartographers), selected the aerial photographs from the 1938, 1950s, 1970s, 1993, and 2003 time frames as the best suited for studying the cumulative impacts along the Platte River. Later, the Government Land Office maps from 1857 were added to the layers of coverage. While these are not aerial photos, it was decided that the information from the river shoreline, in combination with the surveyors notes, were valuable sources of early channel and environmental data.

Loup Public Power District FERC Relicensing

Loup Public Power system was constructed in the late 1930's by diverting water from the Loup River through a canal with a small hydro facility then to a small storage reservoir, and finally through a second hydro-power plant. The project has a water right to divert up to 3,500 cfs from the Loup River approximated 50 miles upstream of the confluence with the Platte River. Associated with this diversion is a need to dredge up to 1 to 1.5 million cubic yards of sediment (mostly sand) from the stilling basin for nearby storage. Discharge from the last hydro units passed through a tailrace canal that discharged into the Platte River about one mile below the confluence of the Loup River to the Platte River near Columbus, Nebraska. Hydro-peaking routinely occurs that influences the hydrograph of the lower 100 miles of the Platte River. State and federal listed piping plover and least terns use the dredged sand piles, the lower Loup River, and the lower Platte River for nesting and rearing. In addition endangered pallid sturgeon use the lower Platte 35 miles of the Platte River. Early in 2008 preliminary meetings were initiated with LPPD officials, U.S. Fish and Wildlife staff and NGPC staff to discuss FERC relicensing environmental issues (including hydrologic and sediment supply) and seek conditions for a new license before the current license expires in 2014.

Niobrara Instream Flow Initiative

In May 2006 the Nebraska Game and Parks Commission (Commission) passed a resolution for an agency initiative to develop recommendations for instream appropriations in the Niobrara River for fish, wildlife and recreation needs. The Niobrara River is approximately 690 km long, rising in the High Plains in eastern Wyoming, then flows east across northern Nebraska to the Missouri River on Nebraska's northeast border. The Commission established a series of planning teams to initiate a collaborative multi-disciplinary approach for the Niobrara River Initiative. These include a Core Team that coordinates project development and progress, a

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Science Team, a Partnership Team, a Public Outreach Team, an Education Team, and a Legal Team. The Core Team provides status reports to an Internal Oversight Team of agency administrators. Funding is provided from three major sources; Federal Aid to Sport Fish Restoration and Wildlife funds for staff time, Nebraska Environmental Trust two-year grant for contracted studies and public outreach efforts, and a National Park Service grant to cost-share selected studies. The National Park Service has a strong presence on the river due to their management of the National Scenic and Recreation River reaches. Contracted studies currently include: Hydrologic and water budget analyses of the Niobrara River using the USGS HIP software and climate data by the University of Nebraska-Lincoln (UNL); a bibliography of reports and literature on the basin by UNL; Hydraulic geometry and macro-scale habitat evaluations of the river by the U.S. Geological Service (USGS); Flows and recreational floating on the Scenic River reach by Confluence Research and Consulting (CRC); and Socio-economics of recreational floating and irrigation uses in the Niobrara River basin by University of Nebraska-Omaha (UNO). The Commission plans to help fund a U.S. Fish and Wildlife Service fishery study on the lower 48 km of the Niobrara River. Early results show the river hydrology has been affected by irrigation development; geospatial data and macro-scale habitats classifications are identified; scenic reach optimal flows for canoeing, tubing, and some whitewater kayaking have been evaluated.. Additional depletions of 50-100 cfs would reduce days of acceptable recreational floating. Discussions and meetings are planned for later in 2008 for funding new fishery studies and geomorphology studies in the middle and lower Niobrara for 2009 and on. Methods of assessing flow needs for fishery and wildlife needs are ongoing. Nebraska's first instream application for a recreation appropriation for canoeing should be filed during 2009, pending completion of ongoing studies. In addition the Commission is planning for fish and wildlife studies for later Niobrara River Initiative instream appropriations.

As a footnote to the Niobrara Initiative, concerns by a local government official and a local state senator to Nebraska's legislature is prompting efforts to make changes in Nebraska's instream flow statutes in spite of collaborative efforts by NGPC.

North Dakota, Bruce Kreft

North Dakota's instream flow activities have been fairly limited over the past couple of years; however we have not been totally stagnant.

The North Dakota Game and Fish Department has been involved with a sensitive, yet contentious issue involving the USFWS Partners for Wildlife Program. On February 28, 2008, our Director, Terry Steinwand sent a letter to the State Partners for Wildlife Coordinator outlining several concerns over wetland creations and conversions in western North Dakota. The program primarily consists of constructing earthen dams on beaded streams, intermittent streams and slope wetlands mainly to create small 2-5 acre impoundments. Some of the specific concerns outlined were cumulative impacts to stream connectivity, habitat fragmentation, altering wetland hydrology and permanency, primary productivity, stream discharge and water quality. We are trying to work cooperatively with Partners staff to develop criteria for the placement of these dams that addresses our concerns; however, none have been agreed to at this time.

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The Department has been working as a cooperative agency with the Bureau of Reclamation (BOR) on developing environmental flows associated with a water transfer project. The Red River Valley Water Supply Project would move water from the Missouri River to the Red River Valley in eastern North Dakota for municipal, residential and industrial uses. The project proposes to utilize a biota treatment plant, a pipeline and a natural water course to convey the water to its destination. The Department has not supported an alternative but has provided technical information to include environmental flows into the alternative analysis. The BOR's preferred alternative included our environmental flow recommendation and will be implemented provided the project proceeds.

The Department routinely comments on North Dakota Water Appropriation Permit applications. On select surface water withdrawal applications, we include verbiage to protect the available instream flow and to cease water withdrawal once the river recedes to the agreed upon flow. We have had little to no success with this strategy due to the interpretation our water laws but continue to promote and encourage our State Engineer to incorporate instream flows into the permitting process.

Ohio, John Navarro

Ohio has not done anything in the past two years with respect to Instream Flow.

South Dakota, Ron Koth

SD does not have an active instream flow program, however, in the last year due to an ongoing FERC licensing action at a 4MW hydro on Spearfish Creek in the northern Black Hills a Delphi type instream flow study was conducted. The goal of the study was to determine the appropriate bypass flow for a 3.5 mile reach of Spearfish Creek below the hydro diversion while at the same time having no measureable effect on the reach of stream downstream of the hydro-discharge. A consensus was reached by the members of the Delphi team which were all professional fishery biologists and submitted to the applicant for their use in development of the license application. The Delphi recommendation was not used; therefore an interesting dynamic is now in play due to the specific circumstances which provide the US Forest Service with 4(e) mandatory conditioning authority on the license. The US Forest Service was included in the make-up of the Delphi team. Time will tell the ultimate results as the license application was submitted to FERC on in early September 2008.

Wisconsin, Martin Griffin

Here is a summary of some of our states activities via Wisconsin Department of Natural Resources.

FERC Relicensing of Dams

- The state has always taken this responsibility seriously and when relicensing happens (since it doesn't happen very often) views it as an opportunity to incorporate in stream flow requirements. When dealing with FERC relicensing projects, the only way the state

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can require the applicant to perform an instream flow study is if the dam operation violated the State's public interest in the waterway (in other words we have to have a reason under our State's public trust doctrine). Fortunately, activities that affect fish and wildlife habitat are included in those that are protected under the public trust doctrine. 2 major recent projects stand out.

1. In a recent relicensing on the Fox River during the relicensing process the utility company (Kaukauna Utilities) informed us that they were moving to a larger power capacity that that would use considerably more water from the river. Using this information we were able to get FERC to require an instream flow study. I have a copy of the letter sent to KU from FERC outlining the requirements if anyone is interested. Assuming that the instream flow study actually moves forward, using the results from the instream flow study, now the State's role becomes that of the negotiator on the appropriate flows for the side channels and the main stem of the river. Aside from relicensing we do not always have an opportunity to deal with flows that are related to dam operation since most dams do not have operating orders and if they do they just say 'operate with run of river flows', which is easy to see how difficult that is to interpret.
2. In a recent relicensing on the Flambeau River, we were able to use an instream flow study to come up with great language for a water quality certification that is sometimes required to be issued under the clean water act when dealing with FERC licensing. Some of the language includes provisions on Seasonal operation – *Dairyland proposed to continue its existing seasonal reservoir drawdown operation in late winter and early spring to moderate floods and the accumulation of ice on the upstream face of the spillway gates; Dairyland has discretion to lower the reservoir level up to 3 feet after February 1, provided that normal pool elevation is restored by May 1; Normal Operation - *Dairyland proposes to maintain the reservoir elevation between 1182.48 and 1183.48 feet MSL; Under the settlement agreement in normal operations, Dairyland would re-regulate peaking flows from upstream by discharging inflow to the Big Falls Project and minimizing changes in the elevation of Flambeau Reservoir.* -if anyone is interested in seeing a copy if the certification I can provide it.*

Fish passage

- In addition to instream flow studies we have also been taking the opportunities address fish passage on dams on the Menominee River to develop a fish passage plan in consultation with the agencies. We're working on that plan with the goal of passing lake sturgeon and other species. This action was actually stipulated some of these dam licenses that the utility operators were issued 10 years ago (you can see how long it takes to implement stipulations and articles in these FREC licenses).