

RESPONSES TO STUDY REQUESTS

WHOOPING CRANE POWER LINE IMPACT EVALUATION

RESPONSE 1.0 WHOOPING CRANE POWER LINE IMPACT EVALUATION

The District provided the following response to the U.S. Fish and Wildlife Service's (USFWS's) study request submitted on February 9, 2009. In Scoping Document 2 (SD2), FERC agreed with the District that the transmission and distribution lines referenced by USFWS are unrelated to FERC's licensing action. The Project does not have any primary transmission lines and FERC has no authority to require any modifications to the District's other transmission and distribution lines to reduce or mitigate any potential adverse effect on whooping cranes. Moreover, the District's other transmission and distribution lines would continue to transmit and distribute power regardless of whether the Project exists or would continue to operate under a new license; therefore, they are independent of FERC's action.

Based on the following factors, the District proposes that the transmission and distribution line impact evaluation, as recommended by the U.S. Fish and Wildlife Service (USFWS), is not necessary to facilitate Project relicensing:

1. The District does not own any overhead transmission voltage lines (lines with a voltage above 115 kilovolts [kV]). The sub-transmission and distribution lines that the District owns are independent of the Project (are not interrelated or interdependent). These power lines would remain in use regardless of Project relicensing. The District's only overhead sub-transmission and distribution lines interrelated to Project operations are those located within the Project Boundary¹ that are used to provide power to the Project Headworks and developed recreation areas.
2. No whooping crane sightings have been documented within the Project Boundary. The nearest point of the Project Boundary is located approximately 35 miles east of the whooping crane's primary migration corridor,² as defined by the U.S. Geological Survey (USGS) (USGS, August 3, 2006), the Nebraska Game and Parks Commission (NGPC) (NGPC, November 2002), and USFWS (Stehn, June 1, 2007). This primary migration corridor is also referred to as the 100-mile-wide migration corridor by USFWS (Stehn, June 1, 2007). Maps showing these corridors are included at the end of this response.
3. Throughout the entire 100-mile-wide migration corridor, which spans from northern Alberta Canada to southern Texas, the USFWS report has not documented any whooping crane collisions with power lines east of the

¹ The Project Boundary is defined and shown in Figure 4-1, Sheets 1-14, in the PAD.

² All references in this document to whooping cranes and the whooping crane migration corridor are specific to the Aransas-Wood Buffalo National Park population, which migrates between Wood Buffalo National Park in northern Alberta Canada and the Aransas Wildlife Refuge in southeast Texas (Canadian Wildlife Service and USFWS, March 2007).

USFWS-delineated 100-mile-wide migration corridor (Stehn, June 1, 2007). The Project Boundary is located east of the migration corridor.

1.1 USFWS STUDY REQUEST

In response to the District's Pre-Application Document (PAD) (Loup Power District, October 16, 2008) and FERC's Scoping Document 1 (FERC, December 12, 2008), USFWS issued comments on these documents on February 9, 2009. On page 2 of its comment letter, USFWS recommended that the District evaluate all transmission and distribution lines owned and maintained by the District and/or power lines that are located within the Project Boundary for their potential to impact migrating whooping cranes.

1.2 DISTRICT RESPONSE TO STUDY REQUEST

The following sections detail the District's justification for proposing that the transmission and distribution line impact evaluation as proposed by USFWS is not necessary to facilitate Project relicensing.

1.2.1 Project-Associated Transmission Lines

Consistent with the following excerpt from Section 4.2.21 of the PAD, no overhead transmission voltage lines are included in the Project or contingent upon relicensing:

All power produced at the Monroe and Columbus powerhouses is sold at the on-site substations to NPPD. For this reason, no overhead transmission voltage lines are associated with the Project license. The District does own and maintain extensive overhead distribution voltage lines to serve customers throughout its four-county service area.

However, none of these lines are directly associated with the Project.

FERC defines transmission lines as being 115 kV and above. According to this definition, the District does not own any transmission lines. All transmission lines previously owned by the District were sold to the Nebraska Public Power District (NPPD) in November 1981. All lines currently owned by the District are sub-transmission or distribution lines.

The overhead sub-transmission and distribution lines associated with the District's four-county service area are independent of Project relicensing. These lines distribute power purchased from NPPD to the four-county area regardless of whether the power is generated at the Project or another power generating facility.

The only overhead power lines directly related to Project relicensing are the sub-transmission and distribution lines that provide power to the Project Headworks and developed recreation areas that are located inside the Project Boundary.

1.2.2 Whooping Crane Occurrences in the Project Boundary

There are no documented whooping crane sightings in the Project Boundary (NGPC, October 2, 2008).

The nearest point of the Project Boundary lays approximately 35 miles east of the USGS-delineated whooping crane primary migration corridor, an area in which 82 percent of all confirmed post-1949 sightings in Nebraska occur (USGS, August 3, 2006)³. USGS determined the primary migration corridor through Nebraska to be between 100 and 120 miles wide by plotting all of the confirmed sightings in the state during the last 30 years and drawing straight lines to enclose 70 to 100 percent of the sightings at each latitude (USGS, August 3, 2006). USGS goes on to state that “the remaining sightings [outside of the primary migration corridor] are primarily to the west [of the primary migration corridor].” As stated previously, the Project Boundary is 35 miles east of the primary migration corridor.

In its February 9, 2009, comment letter, USFWS states that the Project Diversion Weir lies within the migration corridor of the whooping crane. USFWS then provides the three whooping crane sightings nearest, but not within, the Project Boundary. The District provides the following clarifications to these statements:

- Concerning the USFWS definition of whooping crane migration corridor, USFWS is consistent with USGS and NGPC in assigning a 100-mile-wide migration corridor in which USFWS states that 82 percent of all known sightings have occurred (Stehn, June 1, 2007). The Project Boundary is approximately 35 miles east of this 100-mile-wide migration corridor, as defined by USFWS. Beyond the 100-mile-wide migration corridor agreed upon by multiple agencies, USFWS also defines a more liberal 200-mile-wide corridor in which an additional 12 percent of all known sightings have occurred (total of 94 percent of all known sightings) (Stehn, June 1, 2007). The Project is located within this expanded, 200-mile-wide corridor.
- The three documented sightings noted by USFWS represent isolated occurrences that span a 12-year time frame. The closest sighting was 3 miles west of the Project Boundary.

1.2.3 Whooping Crane Power Line Collisions

In a draft document by Mr. Tom Stehn, USFWS Whooping Crane Coordinator, titled “Whooping Cranes and Wind Farms – Guidance for Assessment of Impacts,” dated June 1, 2007, Mr. Stehn not only discusses the potential for whooping crane collisions with wind turbines, but also the potential for collisions with associated power lines

³ NGPC has delineated a primary migration corridor which is very consistent with that delineated by USGS. NGPC also states that 80 percent of confirmed sightings occur within this corridor (NGPC, February 2002).

(Stehn, June 1, 2007). Mr. Stehn states that along the entire 200-mile-wide migration corridor (Alberta to Texas), there are nine documented whooping crane collisions with power lines. Based on the location of the documented collisions in relation to the 100- and 200-mile-wide corridors, Mr. Stehn states that “The chance for a whooping crane colliding with a [wind] turbine or associated power line is much greater within the main 100-mile whooping crane migration corridor, less in the 100 to 200 mile-wide corridor, and negligible outside the 200-mile corridor” (Stehn, June 1, 2007). More specifically, the document provides the following collision data:

- Seven of the nine collisions (77 percent) occurred within the 100-mile-wide corridor.
- One of the nine collisions (11 percent) occurred within the 200-mile-wide corridor, west of the 100-mile-wide corridor.
- One of the nine collisions (11 percent) occurred west of the 200-mile-wide corridor.

In summary, over the entire length of the primary migration corridor, there are no documented whooping crane collisions with power lines east of that corridor. The Project is located 35 miles east of the primary migration corridor.

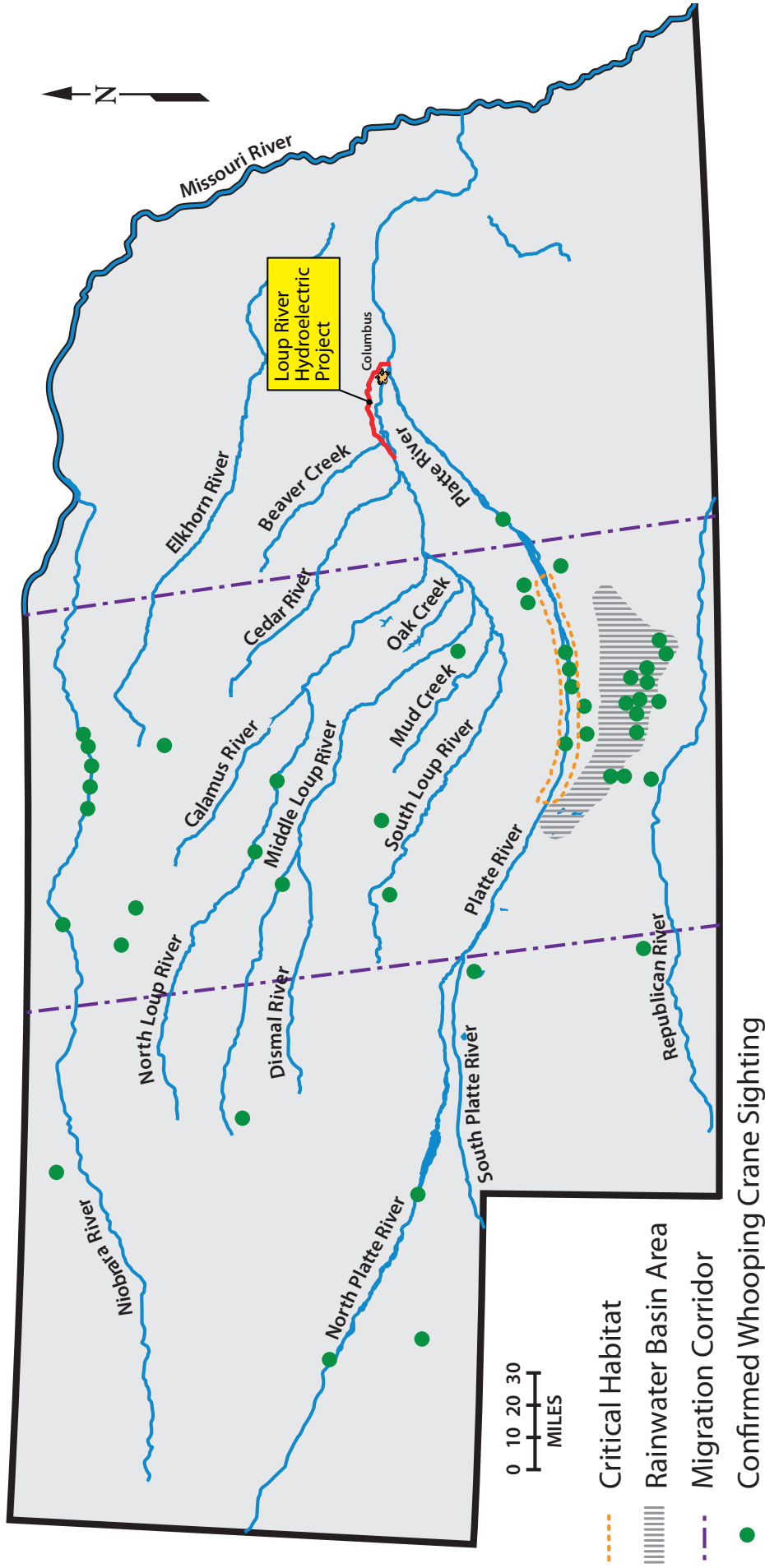
1.3 REFERENCES

- Canadian Wildlife Service and USFWS. March 2007. International Recovery Plan for the Whooping Crane (*Grus americana*). Ottawa: Recovery of Nationally Endangered Wildlife (RENEW) and U.S. Fish and Wildlife Service, Albuquerque, New Mexico. Available online at http://ecos.fws.gov/docs/recovery_plan/070604_v4.pdf.
- FERC. December 12, 2008. Scoping of Environmental Issues for Relicensing the Loup River Hydroelectric Project. Office of Energy Projects. Washington D.C.
- Loup Power District. October 16, 2008. Pre-Application Document. Volume 1. Loup River Hydroelectric Project. FERC Project No. 1256.
- NGPC. November 2002. Whooping crane (*Grus americana*): Migration Distribution in Nebraska – February 2002. NE T.G. Notice 522, Section II, NRCS.
- NGPC. October 2, 2008. Personal communication (email) from Krystal Stoner, Environmental Analyst Supervisor, Nebraska Natural Heritage Program, Nebraska Game and Parks Commission, to Melissa Marinovich, Environmental Scientist, HDR.
- Stehn, Tom. June 1, 2007. “Whooping Cranes and Wind Farms – Guidance for Assessment of Impacts.” U.S. Fish and Wildlife Service, Whooping Crane Coordinator. Available online at <http://www.neo.ne.gov/renew/wind-working-group/wind-whoopingcranes.pdf>.

USFWS. February 9, 2009. Letter from June M. DeWeese, Nebraska Field Supervisor, to Ms. Kimberly Bose, Federal Energy Regulatory Commission, regarding comments on the Pre-Application and Scoping Documents for the Loup River Hydroelectric Project.

USGS. August 3, 2006. “Platte River Ecology Study: Whooping Cranes.” *Northern Prairie Wildlife Research Center*.
<http://www.npwrc.usgs.gov/resource/habitat/plriveco/wcranes.htm>.

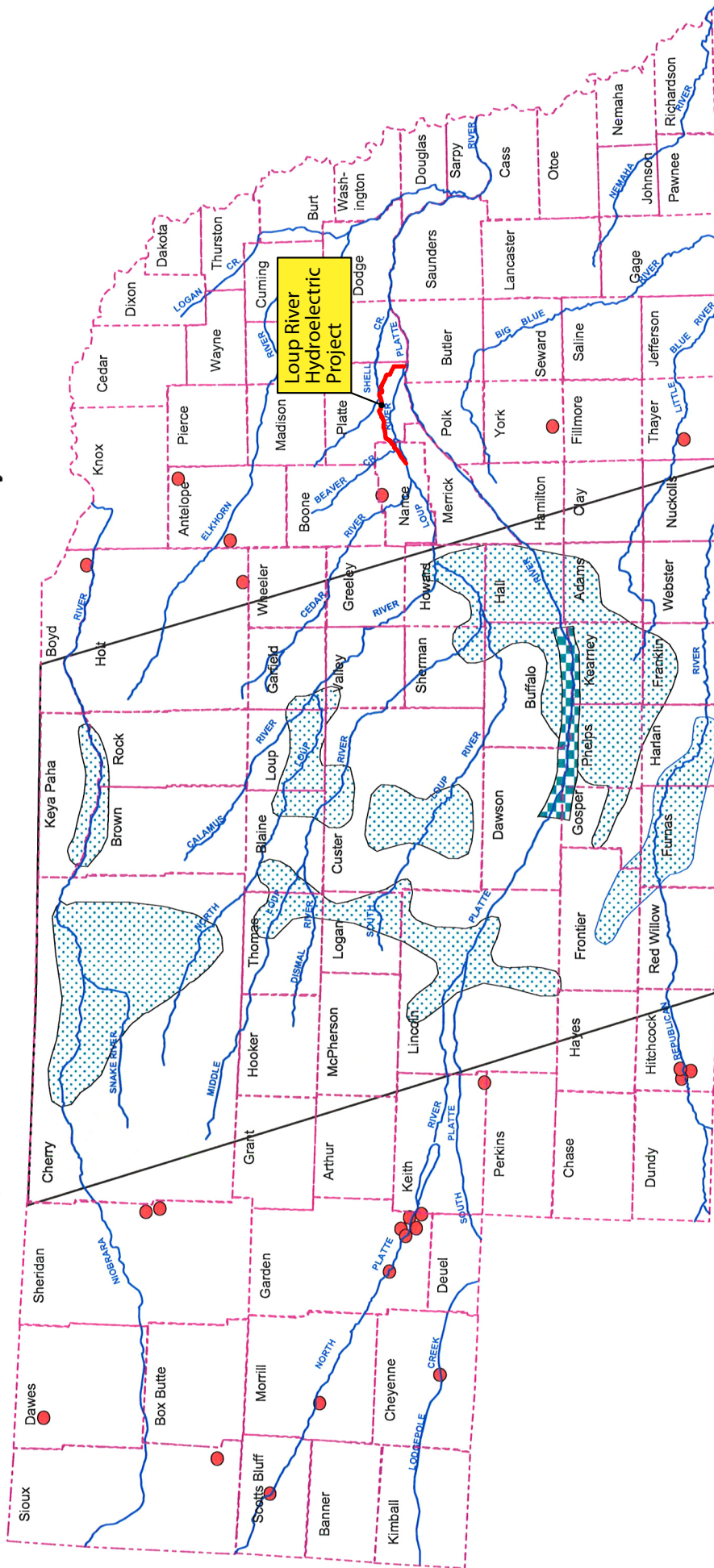
Loup River Hydroelectric Project location relative to whooping crane migration corridor and confirmed sightings (1950-spring 1980) in Nebraska.



Source: Basemap - USGS Platte River Ecology Study, Figure 13, accessed from <http://www.npwrc.usgs.gov/resource/habitat/plriveco/figures/fig13.htm>

Whooping Crane (*Grus americana*)

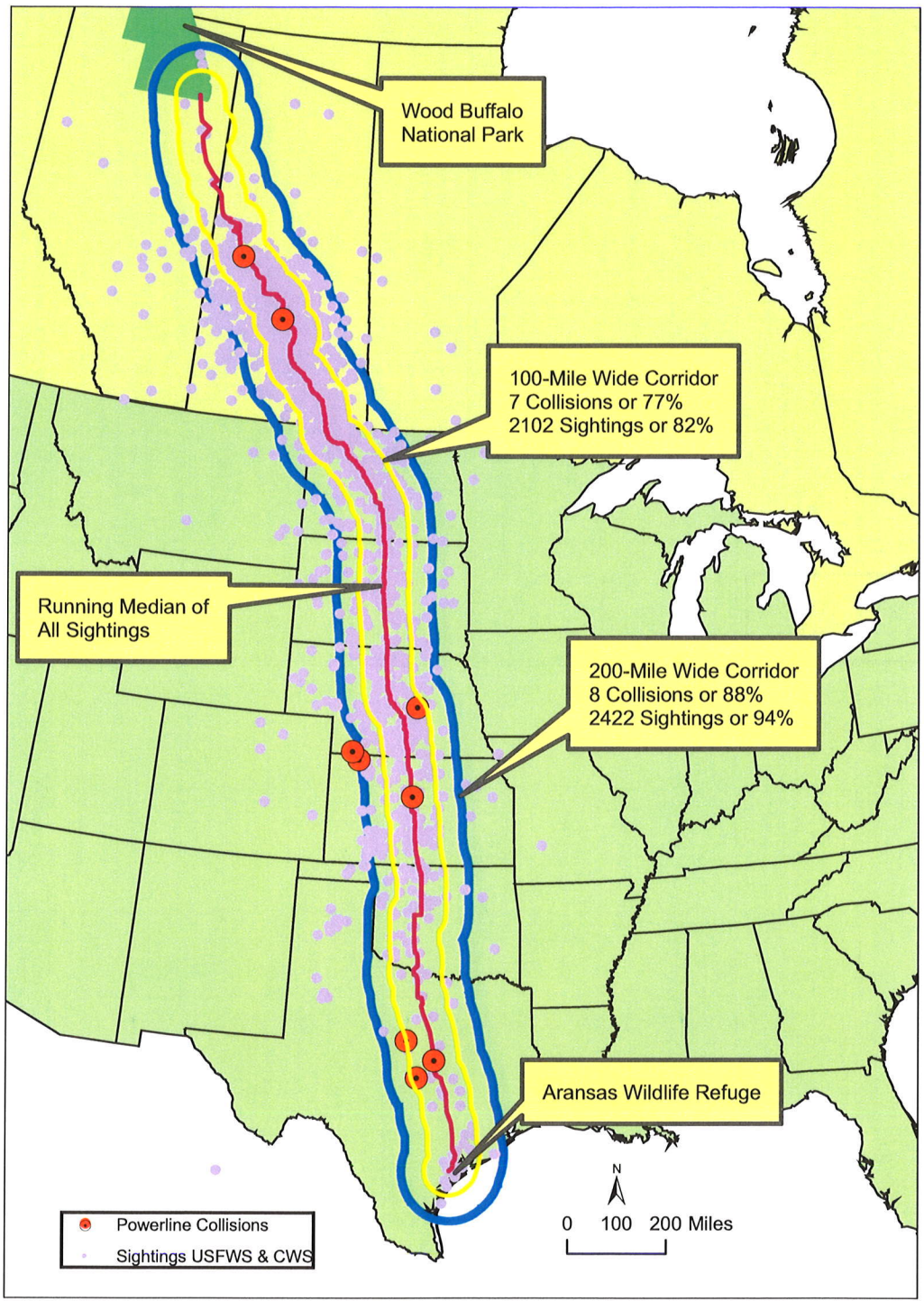
Migration Distribution in Nebraska - February 2002



-  PRIMARY USE AREAS DURING MIGRATION
-  80% OF CONFIRMED SIGHTINGS AND PRIMARY MIGRATION CORRIDOR
-  CRITICAL HABITAT
-  ISOLATED SIGHTINGS

NE T.G. Notice 522
Section II
NRCS-NOVEMBER 2002

NOTE: Loup River Hydroelectric Project has been superimposed on whooping crane migration corridor base map from Nebraska Game and Parks Commission.



Created by Tom Wassenich – Revised 2005

FLOW DEPLETIONS IN THE LOUP RIVER EVALUATION

RESPONSE 2.0 FLOW DEPLETIONS IN THE LOUP RIVER EVALUATION

Based on the discussion to follow, the District proposes that no study or further issue discussion is warranted during Project relicensing related to flow depletions in the Loup River upstream of the Project.

2.1 USFWS STUDY REQUEST

In response to the District's Pre-Application Document (PAD) (Loup Power District, October 16, 2008) and FERC's Scoping Document 1 (FERC, December 12, 2008), USFWS issued comments on these documents on February 9, 2009. On pages 10 and 11 of its comment letter, USFWS recommended that the District study the possible cumulative impacts of future water depletions on the Loup River above the Diversion Weir at Genoa on Federally listed species. At the May 27-28, 2009, Study Plan Meeting, USFWS restated this as a request to evaluate potential future changes in hydrology related to flow depletions.

2.2 DISTRICT RESPONSE TO STUDY REQUEST

With regard to the study requested by USFWS and how this issue relates to Federal project review under the Endangered Species Act of 1973 (16 USC 1531 et seq.) and the National Environmental Policy Act (42 USC 4321-4347), the District provides the following information.

As noted in the PAD, Nebraska water law uses a priority and preference system to determine order of use for water. Priority is typically based on date of application, and preference is based on type of use. Under Nebraska's water preference system, domestic and agricultural water use outranks water used for industrial and power generation purposes. Therefore, although the District has the senior water right in most cases, it cannot prevent consumptive uses upstream of the point of diversion for water uses with a higher preference, nor can it speculate as to the amount and location of future uses.

Furthermore, the District understands that the evaluation of potential future changes in hydrology (flow depletions or flow increases) related to other reasonably foreseeable future actions will be conducted as part of the cumulative effects analysis included in the license application and environmental assessment. The District does not intend to speculate on future flow scenarios related to other actions as part of the relicensing studies.

In evaluating the cumulative effects of the Project for Endangered Species Act compliance in relation to other reasonably foreseeable future actions, the District would consult with USFWS to identify those actions that have completed Section 7 consultation. The USFWS evaluation of these other reasonably foreseeable future actions would include identification of impacts, and the District would compare these

impacts to the Project's impacts on the same resources and determine if there are overlapping, or cumulative, effects.

In evaluating the cumulative effects of the project for NEPA compliance in relation to other reasonably foreseeable future actions, the District will apply the standard that the future action would have to have sufficient definition that it could be evaluated and have sufficient progress toward implementation that it could be judged to be reasonably foreseeable to occur. Use of this standard precludes the inclusion of actions for which future implementation is too speculative to be reasonably foreseeable.

Note: In the PSP, the District included information relative to the December 2008, preliminary determination of the lower Platte River basin as fully appropriated by the Nebraska Department of Natural Resources (NDNR). Since submittal of the PSP, NDNR has rescinded its preliminary full appropriation determination and declared that the lower Platte River is not fully appropriated at the present time. Without additional constraints on the water supply, NDNR analysis of future water supplies in the lower Platte River basin indicates that the lower Platte River basin may become fully appropriated in the future; however, the Nebraska State legislature enacted legislation (LB 483) that sets limits on future water appropriations within the lower Platte River basin (including the Loup River basin) and established requirements for local jurisdictions to develop water management practices.

2.3 REFERENCES

FERC. December 12, 2008. Scoping of Environmental Issues for Relicensing the Loup River Hydroelectric Project. Office of Energy Projects. Washington D.C.

Loup Power District. October 16, 2008. Pre-Application Document. Volume 1. Loup River Hydroelectric Project. FERC Project No. 1256.

USFWS. February 9, 2009. Letter from June M. DeWeese, Nebraska Field Supervisor, to Ms. Kimberly Bose, Federal Energy Regulatory Commission, regarding comments on the Pre-Application and Scoping Documents for the Loup River Hydroelectric Project.

RESPONSE 3.0

WATER QUALITY EVALUATION

RESPONSE 3.0 WATER QUALITY EVALUATION

Based on the multiple factors discussed in this document, the District proposes that the detailed water quality study of District waters, as proposed by the U.S. Fish and Wildlife Service (USFWS) during Project scoping and following the submittal of the District's Proposed Study Plan, is neither necessary for Project relicensing nor is in the best interest of downstream water users. Instead, the District proposes to facilitate Nebraska Department of Environmental Quality (NDEQ) polychlorinated biphenyl (PCB) fish tissue sampling of Lake Babcock in 2009 in association with NDEQ's regularly scheduled 2009 PCB fish tissue sampling in the Tailrace Canal at the U.S. Highway 30 bridge.

This response includes a summary of USFWS's study requests; the District's response to those study requests; a water quality issue brought forth by FERC in its Scoping Document 2; the District's proposal for PCB sampling; a summary of USFWS comments related to a proposed study plan for PCB sampling; and the District's response to those comments.

3.1 USFWS STUDY REQUESTS

In response to the District's Pre-Application Document (PAD) (Loup Power District, October 16, 2008) and FERC's Scoping Document 1 (FERC, December 12, 2008), USFWS issued comments on these documents on February 9, 2009. On pages 14 through 16 of its comment letter, USFWS requests that the District perform the following studies in association with the relicensing process:

- A "robust sampling survey" to evaluate total PCBs within the Project area and immediately downstream. The survey should be designed to evaluate PCB exposure and effects on fish and aquatic or aquatic-dependent wildlife by sampling to evaluate exposure pathways including water, sediment, and food items.
- A study on non-source pollutant exposure pathways into the Project area. The study should be aimed at identifying strategies to reduce non-point source pollution (nutrients, pH, *Escherichia coli* bacteria, and atrazine) before it enters the Project area or is discharged from the Project area into the Platte River.

3.2 DISTRICT RESPONSE TO STUDY REQUESTS

The District disagrees with USFWS's request for a detailed water quality study. The District believes that a detailed study is neither necessary for Project relicensing nor is in the best interest of downstream water users. The District's response to USFWS's requests for a PCB survey and a study on non-source pollutants is provided below.

3.2.1 Shared Position of NDEQ and the District on a PCB Survey

NDEQ is tasked with administering the water quality program in the State of Nebraska. As stated below, NDEQ is opposed to PCB sampling as proposed by USFWS and beyond what is already being performed in accordance with standard state water quality assessment methodologies. The District supports NDEQ's position.

During the January 12, 2009, agency scoping meeting for the Project and in the context of PCB-related issues and status at the state level, Mr. John Bender, NDEQ Water Quality Standards Coordinator, stated:

PCBs, mercury, and dieldrin are the three contaminants that we [NDEQ] find statewide as giving us a problem with fish tissue. Not necessarily in this locale [Loup Power Canal], but throughout the state. PCBs are in any part of the state. It's not just restricted to the Columbus area. We've got it in the lower Platte region. We've got it in the Elkhorn. We've got it in the Missouri River. We've even got it out near North Platte.

NDEQ has not identified a source or a responsible party for the PCBs detected in the Loup Power Canal.

During the same agency scoping meeting and in the context of concentration trends of PCB sampling performed in the Loup Power Canal to date, Mr. Bender stated:

In my mind the [PCB] levels that we're finding [in the Loup Power Canal] are decreasing. If we had a null hypothesis, it would be that we wouldn't find PCBs this summer,¹ and then we could remove that impairment from our 303(d) list.

Also during the agency scoping meeting and concerning the risks associated with performing extensive PCB sampling beyond the fish tissue sampling already being performed, Mr. Bender stated:

I guess even if we did find low levels of PCBs that triggered continued listing [on the state's 303(d) list], what we know about this compound is that it's probably better leave it in place rather than digging up the countryside and remobilizing it. So the end result in my mind, at least from the environmental agency, would be to leave it in place and accept the low level of leaching because we are not using it. It's been banned [the manufacture of PCBs was stopped in the U.S. in 1977]. We don't have it in use anymore, and the only projection is that in the future, it

¹ NDEQ is scheduled to perform its standard fish tissue sampling of the Loup Power Canal during the summer of 2009. Data collected during this sampling event will determine if a fish consumption advisory will remain in effect for the Loup Power Canal.

will degrade. It's better to accept the low level of it rather than mobilize it and get an extreme amount over a short period of time.

3.2.2 Analysis of Existing NDEQ Fish Tissue Sampling Data

USFWS makes several references to NDEQ's existing PCB fish tissue sampling data on page 15 of its February 9, 2009, comment letter. These data are provided in Table 1.

Table 1. NDEQ Fish Tissue PCB Sample Results

Waterbody	Date	PCB-1248 ^a (mg/kg)	PCB-1254 ^a (mg/kg)	PCB-1260 ^a (mg/kg)	Total PCBs (mg/kg)
Loup Power Canal	10-18-93	0.087	0.059	0.027	0.173
	08-07-94	0.084	U	U	0.084
	08-07-94	0.240	U	U	0.240
	08-07-94	0.260	0.035	U	0.295
	09-16-98	U	U	U	0.000
	08-04-99	0.058	U	0.031	0.089
	08-04-99	0.059	U	0.029	0.088
	08-04-99	0.053	U	U	0.053
	09-29-04	U	U	U	0.000
	08-12-05	U	0.061	U	0.061
	08-12-05	U	U	U	0.000
	08-12-05	U	0.042	U	0.042

Source: NDEQ, November 24, 2008, Sample Data, PCB Concentrations of Fish Tissue in the Loup Power Canal, provided via email from John Bender, NDEQ, to Matt Pillard, HDR.

Note:

^a U = non-detect = 0.00 for mean calculations as defined below in this Section 3.2.2, Analysis of Existing NDEQ Fish Tissue Sampling Data, below.

The District provides the following clarifications with regards to the analysis of this data, as provided by USFWS:

1. USFWS mistakenly states that the highest PCB concentrations collected in the Loup Power Canal (295 µg/kg) were sampled in 1998. This concentration was actually sampled in 1994. This clarification that the highest PCB concentration was sampled 4 years earlier than the date cited by USFWS, and during only the second year of PCB sampling in the Loup Power Canal (11 years prior to the most recent sampling event of 2005), provides further support to the statement made by Mr. Bender during the

agency scoping meeting on January 12, 2009, that PCB concentrations in fish tissue samples collected in the Tailrace Canal are decreasing (as quoted in Section 3.2.1, Shared Position of NDEQ and the District on a PCB Survey, and shown in Table 1, above).

2. USFWS provides mean total PCB concentrations for samples collected between 1993 to 1999 and 2004 to 2005 without including non-detect samples in their mean calculations. As stated in the following excerpt from “Methodologies for Waterbody Assessments and Development of the 2008 Integrated Report for Nebraska” (NDEQ, November 2007), non-detect samples should be included in data analysis:

Section 2.5.7 Values Below Detection Limits:

...measurements below detection limits may provide valuable information on situations where pollutants and pollutant loads are not a concern. Finally, elimination of the low-end values may skew a data set.

To accurately depict the mean value of PCB concentrations in the collected fish tissue samples, a value of 0.00 should be used for any sample listed as non-detect. The assignment of this value is based on NDEQ’s “Findings of the 2005 Regional Ambient Fish Tissue and Follow-Up Programs in Nebraska” (NDEQ, December 2006), which states that “the concentration of a contaminant in the fish tissue was used as the exposure concentration. Contaminants present below the target reporting limit were considered not to occur in the sample.”

When non-detect readings are included as 0.00 values in NDEQ fish tissue sample mean total-PCB calculations, the 1993 to 1999 value is 128 (± 99 – standard deviation), instead of the 146 (± 91) as calculated by USFWS. Furthermore, when non-detects are accounted for, the mean value of the 2004 to 2005 samples is 26 (± 30), instead of the 52 (± 13) as calculated by USFWS. USFWS states that due to small sample size and high variability between samples, the difference in the USFWS-calculated mean values was not significant. By the definition of statistical significance for comparing two means, this is true. The difference between the mean values calculated using the non-detect samples is also not significant; however, the following discussion describes how a sample of this (small) size cannot be significantly different, regardless of mean values.

Comparing the mean values at a 95 percent confidence interval yields results indicating that mean concentrations of PCBs in the two sample groups are not significantly different. However, comparison of the standard deviations using a power test indicates that due to the small sample size $n=12$ (eight samples from 1993 to 1999 and four samples from 2004 to 2005), there is insufficient data to avoid Type II errors in a test comparing

the two sample means. Under the null hypothesis, the mean concentrations of PCBs are equal; however, the sample lacks the power in this statistical test to reject the false null hypothesis (that is, even if all of the 2004 to 2005 samples were non-detect, the mean would not be significantly different from the mean of the 1993 to 1999 samples). Furthermore, the power test indicates that an approximate total sample size of $n=26$ would be required to compare the difference between the two sample means (0.128 mg/kg and 0.026 mg/kg) and minimize the probability of Type II errors.

3.2.3 Shared Position of FERC and the District on Non-Source Pollutants

With regard to USFWS's concerns related to non-source pollutants, the District concurs with FERC's statement, as presented in Scoping Document 2 (FERC, March 27, 2009):

Inputs of atrazine, nutrients, and bacteria to the project canal system from non-point sources are unrelated to the project or operations, and therefore, the requested issue is not included as an issue for analysis in our NEPA document.

3.3 FERC WATER QUALITY ISSUE IDENTIFIED IN SCOPING DOCUMENT 2

As a result of USFWS comments related to PCBs on February 9, 2009, FERC identified the following issue related to Project operations that could potentially mobilize PCBs (if they are present within the Project Boundary) (FERC, March 27, 2009):

The potential exists for dredging operations to mobilize PCB-laden sediments if present in the settling basin. In addition, small fish discharged onto the North Sand Management Area with sediments during dredging activities could potentially contain PCBs. Such fish could be ingested by federally listed least terns nesting and feeding in the North Sand Management Area. Therefore, we have modified SD2 to show that we will assess the effects of project operations on PCB transport within the project area.

3.3.1 Project Operations that May Mobilize Sediment

The District performs the following routine operational and maintenance activities that could have the potential to mobilize PCB-laden sediments (if they are present in the Loup Power Canal and/or Lake Babcock).

Dredging

A floating Hydraulic Dredge is employed to remove accumulated sediment from the Settling Basin. Without frequent dredging, the Settling Basin would quickly become choked with sand and cause the Project to shut down. Each year, the maintenance

dredging program removes approximately 1 million to 1.5 million cubic yards of sediment from the Settling Basin. Accumulated sediment—consisting primarily of sand, with minor amounts of silt and gravel—is dredged from the basin and pumped through an articulated steel pipeline to a series of fixed steel discharge pipes spaced along both sides of the Settling Basin. These discharge pipes distribute the sediment to the North and South Sand Management Areas. Dredging operations are limited to the Settling Basin. The District has never dredged any part of the Loup Power Canal or the regulating reservoirs and has no plans to do so in the future.

Flushout

The District periodically performs a maintenance procedure known as a “flushout.” Its purpose is to maintain the submerged Lake Babcock channel that extends through that reservoir to the Intake Canal to the Columbus Powerhouse. By removing any newly accumulated sediment, this procedure maintains the regulating capacity of Lake Babcock and the conveyance capacity of the Intake Canal. To perform a flushout, the pool elevation of the regulating reservoirs is lowered to expose the “bottom” of Lake Babcock. Then all three generating units in the Columbus Powerhouse are operated at full gate. This creates a sufficient current in the Lake Babcock channel and the Intake Canal to move the sediment through the Columbus Powerhouse and on down the Tailrace Canal. Maximum flow rate is limited to 4,800 cfs, the design flow of the Intake Canal and Columbus Powerhouse. Several cycles may be required to achieve desired results. Flushout is typically performed in March, after ice out and prior to fish spawning activity at a time when river flows are high. However, because only two of the Columbus Powerhouse generating units were available during the turbine-generator rehabilitation period, no flushouts have occurred since 2003. Prior to executing flushout activities, and in accordance with NDEQ regulations, the District notifies NDEQ in advance of the intended activity. During a flushout, NDEQ may elect to monitor Tailrace Canal discharges for visible fish kills. NDEQ may also elect to perform water quality measurements including dissolved oxygen, conductivity, pH, temperature, turbidity, and total dissolved solids (NDEQ, June 24, 2009).

Canal Dewatering

The Project design includes three slide gates in the canal bank at station 916, near the 916 Siphon. These gates were designed to permit lowering the water level or draining the Lower Power Canal (the segment of the Loup Power Canal from the Monroe Powerhouse to the Sawtooth Weir) if required. This segment of the Loup Power Canal has only been dewatered twice since Project completion over 70 years ago. It was drained once in September 1986 and again in September 2005. Ironically, both scheduled dewatering events were required to facilitate repairs to the 916 Siphon gates. During both dewatering events, all water and fish drained from the canal were routed directly to the Loup River via the Lost Creek ditch. Other than carefully

controlled draining of the canal, no sediment-disturbing activities were performed during the dewatering procedures.

Bank Stabilization

Lastly, District maintenance procedures require stabilizing several thousand feet of the Loup Power Canal banks each year. Bank stabilization is typically performed using bundled cedar trees and clean rock or broken concrete rip rap. Bank stabilization activities are performed from the canal banks and do not involve disturbing or excavating sediment material that may exist in the canal. Stabilization work does not require draining the Loup Power Canal or lowering the canal water levels.

3.3.2 Discussion of Study Plan to Address PCBs

As a result of the PCB issue that FERC identified in Scoping Document 2, the District prepared a study plan to address this concern and presented the plan during the May 28, 2009, Study Plan Meeting. In summary, the District's plan involved PCB analysis of inflowing and outflowing water column samples collected from only the Settling Basin. The plan also involved PCB tissue sampling of small fish discharged onto the North Sand Management Area; the fish are considered potential forage for the Federally listed interior least tern. Following the District's presentation during the May 28, 2009, Study Plan Meeting, the meeting attendees discussed the plan, as summarized below:

1. The most recent, available fish tissue sampling data for the Loup River Basin and associated with Nebraska's Regional Ambient Fish Tissue Program is from 2003 (NDEQ, November 2004). During this sampling event, no sampling stations located in the Loup Basin upstream of the Project detected PCBs. The lack of PCB detects upstream of Project suggests that PCB-laden sediment is likely not entering the Settling Basin via upstream flows.
2. Sediment in the Settling Basin is continually changing as the basin is in an ongoing cycle of dredging and sediment reintroduction via diverted Loup River flows. When it is considered that the manufacture of PCBs was stopped in the U.S. in 1977, it would be unlikely that a legacy contaminant (PCBs) would be detected in the benthic sediment of an area that is in a state of continual sediment removal and reintroduction.
3. PCBs do not adhere well to the sand substrate that dominates the Loup and Platte rivers in the vicinity of the Project. As a result, it is unlikely that sediment sampling for PCBs would yield viable data. PCBs are highly hydrophobic; their solubility in water is low. A parameter used to define equilibrium concentrations of organic contaminants between soil and water

is called the partition coefficient, K_d .² The partitioning is least affected by sand,³ meaning the organic contaminants are least likely to sorb to the sand particles and is most highly correlated with the organic content of the substrate. In fact, sand has been used as a cap or physical barrier to PCB transport after dredging operations (Wisconsin Department of Natural Resources, October 1, 2008).

4. Interior least terns on the North Sand Management Area feed on small fish discharged from the dredge. However, PCBs are known to bioaccumulate through the aquatic food chain (that is, species at the top of the food chain, generally 14 to 16 inches long and at least 2 years old, have the highest PCB concentrations). This is evidenced by NDEQ's standard practice of sampling sizable predatory fish and bottom-feeding fish⁴ (NDEQ, November 2004). Because the small fish consumed by interior least terns are not near the top of the aquatic food chain, it is not likely that PCB sampling of these fish would show detections above the 110µg/kg guideline for fish-eating wildlife (Newell et al., 1987).
5. Potential PCB sampling of adult interior least tern individuals, young of the year interior least tern individuals, and/or interior least tern eggs would not be a good indicator of PCB-related Project effects on the species. This is because any potential detectable levels of PCBs could not be isolated to a specific source. That is, the transient nature of adult birds provides unlimited exposure potential that could not be isolated to the North Sand Management Area or even the vicinity of the Project. The same transient characteristic would apply to the potential sampling of eggshells and young of the year (transient adult exposure could be conveyed in eggshells, and adult-provided, young forage could have originated outside of the Project Boundary).

The PCBs discussion at the May 28, 2009, Study Plan Meeting concluded with the determination that the plan proposed by the District to sample the water column and fish tissue at the Settling Basin was not necessary. As part of the discussion, NDEQ offered to perform additional fish tissue analysis for PCBs upstream of the Columbus

² K_d is defined as the ratio of the contaminant concentration associated with the solid to the contaminant concentration in the surrounding aqueous solution when the system is at equilibrium.

³ As used by the U.S. Environmental Protection Agency (EPA), K_d can be found using the following equation: $K_d = 10^{-4} K_{oc} [57.735(C_{om}) + 2.0(C_{clay}) + 0.4(C_{silt}) + 0.005(C_{sand})]$, where concentrations of organic material (C_{om} , percent w/w), clay (C_{clay} , percent w/w), silt (C_{silt} , percent w/w), and sand (C_{sand} , percent w/w) are dependent variables and K_{oc} is the ratio of the contaminant concentration on the organic matter on a dry weight basis to its dissolved concentration in the surrounding fluid (EPA, 1999).

⁴ NDEQ conducts PCB tissue samples on the following species: largemouth bass (*Micropterus salmoides*), white bass (*Morone chrysops*), brown trout (*Salmo trutta*), carp (*Cyprinus carpio*), channel catfish (*Ictalurus punctatus*), and freshwater drum (*Aplodinotus grunniens*).

Powerhouse as a means to isolate Project effects related to PCB-contaminated fish. The District stated its intention to abandon the Settling Basin sampling as presented, and to accept NDEQ's offer to conduct additional sampling (see Section 3.4 for details).

3.4 DISTRICT-PROPOSED PCB SAMPLING

The District maintains that the Project is not a source contributing to detectable limits of PCBs in fish tissue samples collected from the Tailrace Canal for the following reasons:

- The District discontinued purchase of products containing PCBs in 1977 and has no records of PCB contamination occurring within the Project Boundary.
- During high flow conditions, fish (which potentially have been exposed to PCBs outside of the Project Boundary) can access the Tailrace Canal from the Platte River.

These facts are consistent with the NDEQ determination of an unidentified source for PCB contamination. However, the District understands the desire for additional information to further isolate Project effects related to PCBs. To accomplish this, the District proposes to cooperate with NDEQ to conduct additional fish tissue sampling using the existing PCB sampling protocols developed by NDEQ under the EPA Region VII Ambient Fish Tissue Monitoring Program (RAFTMP). NDEQ will perform additional fish tissue sampling in Lake Babcock in association with its regularly scheduled 2009 fish tissue sampling in the Tailrace Canal at the U.S. Highway 30 bridge. Consistent with current procedures, the additional samples will be provided to the Region VII EPA laboratory in Kansas City, Kansas, for PCB analysis.

In the event that fish tissue sampling in Lake Babcock should indicate PCB concentrations that exceed the NDEQ defined action levels for human consumption,⁵ Lake Babcock would be added to NDEQ's Follow-up Program.⁶ This program consists of monitoring waterbodies where previous RAFTMP sampling has revealed possible human health concerns on a 6-year monitoring cycle.

3.5 USFWS COMMENTS AND DISTRICT RESPONSES

In response to the District's proposed PCB sampling of the Settling Basin, as presented during the May 28, 2009, Study Plan Meeting, USFWS issued comments on June 24, 2009. The comments related to PCBs that USFWS provided on pages 20

⁵ Action levels for human consumption are defined by NDEQ in accordance with RAFTMP.

⁶ PCB detects below the acceptable human risk threshold would not require the addition of Lake Babcock to NDEQ's Follow-up Program.

through 22 of its comment letter are summarized in Table 2 along with the District’s responses to those comments.

Table 2. USFWS Comments and District Responses

USFWS Comment	District Response
<p>“The Service supports the inclusion of a PCB assessment that includes analysis of sediments...”</p>	<p>The District supports NDEQ’s view on sediment sampling and is therefore not proposing sediment sampling (see the discussion provided in Section 3.2.1.</p>
<p>“Three of 8 samples collected from 1993 - 1998 had PCB concentrations above the 110 micrograms per kilogram ($\mu\text{g}/\text{kg}$) guideline for fish-eating wildlife (Newell et al. 1987). Most recently, two composite fish samples collected from LP1-21800 in 2005 had PCB concentrations of 61 $\mu\text{g}/\text{kg}$ and 42 $\mu\text{g}/\text{kg}$. EPA’s recommended screening value for recreational fishers is 20 $\mu\text{g}/\text{kg}$ (USEPA, 2000).”</p>	<p>The District is concerned that USFWS misrepresents dates and only presents sample concentrations that exceed specified thresholds. In reality, additional sampling has been performed, the majority of which does not exceed USFWS-noted thresholds (see Table 1 and the discussion to follow):</p> <ul style="list-style-type: none"> • Concerning the USFWS statement that “three of 8 samples collected from 1993 - 1998 had PCB concentrations above the 110 micrograms per kilogram ($\mu\text{g}/\text{kg}$) guideline for fish-eating wildlife,” the District points out that USFWS is likely referring to the eight samples collected between 1993 and 1999 (not 1998). What USFWS fails to acknowledge is that four additional samples have been taken since 1999, none of which exceeded, or even approached, the 110 $\mu\text{g}/\text{kg}$ threshold. In the interest of full disclosure, a more accurate statement would be that three of twelve samples collected from 1993–2005 had PCB concentrations above the 110 $\mu\text{g}/\text{kg}$ guideline for fish-eating wildlife, with none of most recent eight samples (none since 1994) exceeding this threshold. • Concerning the USFWS statement that “Most recently, two composite fish samples collected from LP1-21800 in 2005 had PCB concentrations of 61 $\mu\text{g}/\text{kg}$ and 42 $\mu\text{g}/\text{kg}$,” the District again points out, in the interest of full disclosure, that the other sample taken during the 2005 triplicate sampling and the single sample taken during 2004 sampling were non-detect for PCBs.
<p>“Additional fish tissue data are needed for segments of the Project area that have not been previously evaluated.”</p>	<p>The District references the May 28, 2009, Study Plan Meeting discussion in which the District clearly stated its intention to perform exactly what USFWS is proposing. The additional samples, to be collected from Lake Babcock as detailed in Section 3.4, represent additional fish tissue data from segments of the Project that have not been previously evaluated.</p>

USFWS Comment	District Response
<p>“Obtain more fish tissue residue data to evaluate PCB exposure and effects from recreational fishing in the Project area. Fish species that are likely targeted by anglers should be considered for PCB analysis to evaluate risk to human health.”</p>	<p>The District notes that NDEQ is responsible for regulating water quality parameters in Nebraska and evaluating the associated risks to human health. The District further notes that although NDEQ does not oppose further fish tissue sampling, NDEQ repeatedly stated its position during Project scoping that PCB concentrations of fish tissue collected from within the Project Boundary have shown a decreasing trend and could very well show non-detect during scheduled 2009 sampling. This would result in the removal of the PCB impairment designation from the Loup Power Canal in the 303(d) list (see Section 3.2.1 and provided references).</p>
<p>“Fish and other biota do not always reflect localized PCB source conditions and concentrations of PCBs in fish decrease with distance away from the source (Sloan et al., 2002).”</p>	<p>The District agrees that the existing NDEQ fish tissue sampling activities may not be an accurate vector of Project effects, as these samples are collected from the U.S. Highway 30 bridge crossing of the Tailrace Canal. River stage conditions on the Platte River occur that facilitate fish movement into the Tailrace Canal from the Platte River. As these fish may have been exposed to PCB contamination outside of the Project Boundary, the Project vector is jeopardized.</p>
<p>“If the Project area has PCB contaminated sediments, then action alternatives under NEPA could represent: a) change in Project operations by Loup Power District would be instrumental in how PCBs are dispersed, removed, and otherwise managed transport of PCBs from sediment to the water column, b) changes in hydrocycling that minimizes sediment removal from PCB contaminated sites, or c) direct removal of PCB contaminated sediments. Human health advisories may need to be posted in areas that offer public access to recreational fishing.”</p>	<p>The District notes the following:</p> <ul style="list-style-type: none"> a) The District is unclear on the intention and meaning of this comment. Leaving contaminated sediments in place, or capping them if necessary, are accepted methods of PCB management that are widely used. b) Although the District is unclear on the intention and meaning of this comment, the District volunteers that hydrocycling operations do not entail any activities that could potentially mobilize PCB-laden sediment. Various Project operations and maintenance procedures (listed in Section 3.3.1) have been discussed during Project scoping as having the potential to mobilize PCB-laden sediment, assuming it is present within the Project Boundary. Hydrocycling has never been identified and has no bearing on PCB-related concerns. c) The District notes that USFWS is making the unfounded assumption that the District would be identified as the source of the assumed contamination. The District also notes that although a portion of the Loup Power Canal is currently on the 303(d) list for PCBs, NDEQ has never stated a determined source of this contamination.

USFWS Comment	District Response
<p>“According to the Service’s Analytical Control Facility, the 2009 cost for measuring PCBs in a sediment sample is \$315 - \$360 per sample...compared to \$340 - \$416 for tissue samples (ACR, 2009). Therefore, a mixed sampling design that includes sediment and fish tissue could actually cost less. Sediment sampling costs less and would likely require a lower level of effort than biotic sampling.”</p>	<p>The District appreciates the sample costs provided by USFWS; however, the District does not believe that individual sample costs satisfy the intent of the cost and level of effort factors identified in Study Criteria 7 as provided in 18 CFR §5.9(b). That is, USFWS does not state how many sediment samples would be needed or how many person-hours would be required to collect these samples. As no cost or level of effort is provided by USFWS, the District does not believe that USFWS satisfied the study request criteria requirements (18 CFR §5.9(b)).</p> <p>The District’s understanding is that USFWS proposes this method in order to identify a source for PCB contamination. With this in mind, the District notes that contamination source identification is outside the purview of the relicensing process and further notes that current Project operations are in compliance with applicable PCB regulations.</p>
<p>“If the PCB study objectives are left unchanged, data on PCBs would be limited to small fish from the upper canal segment and would not allow for source determination or screening for the protection of human health. The current study objectives would not evaluate PCB exposure pathways to pallid sturgeon, least terns or piping plovers in the downstream lower Platte River segment (LP1-20000), a segment currently listed as impaired by PCBs.”</p>	<p>The District refers USFWS to the discussion of the May 28, 2009, Study Plan Meeting, in which it was ultimately concluded that the study USFWS is referring to was unnecessary and would be substituted with the methods outlined in Section 3.4.</p>

3.6 REFERENCES

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FISH SAMPLING OF THE LOUP POWER CANAL

RESPONSE 4.0 FISH SAMPLING OF THE LOUP POWER CANAL

Based on the widely accepted view that the Loup Power Canal is a healthy and important recreational fishery, and due to the lack of scoping-derived issues related to this fishery, the District announced its intention during the May 27-28, 2009, Study Plan Meeting to exclude Fish Sampling (former Study 6.0) from its Revised Study Plan. All meeting participants accepted this proposal without objection. The following provides details as to why this effort is not necessary for Project relicensing.

4.1 NGPC STUDY REQUEST

In association with preliminary Project scoping, and during the July 17, 2008, Recreation, Land Use, and Aesthetics Working Group Conference Call, NGPC requested special boat access accommodations in order to perform fish sampling activities along the Loup Power Canal. The District stated that it would support NGPC's fish sampling effort and would be agreeable to further discussions concerning access accommodations. On July 24, 2008, at the Multi-Agency Study Needs Meeting, NGPC again expressed its desire to perform fish sampling in the Loup Power Canal and its need for associated boat access.

Subsequent to these preliminary requests, and in response to the District's Pre-Application Document (PAD) (Loup Power District, October 16, 2008) and FERC's Scoping Document 1 (FERC, December 12, 2008), NGPC issued a comment letter on these documents on February 6, 2009. In this letter, NGPC maintained its request for fish sampling to occur but went on to state that it was yet to be determined if NGPC would conduct the sampling effort due to staff limitations and funding.

4.2 DISTRICT RESPONSE TO STUDY REQUEST

In support of the District's intention to exclude Fish Sampling (former Study 6.0) from relicensing studies, the District provides the following:

- It is generally accepted that the Loup Power Canal is an excellent fishery that is used extensively by anglers in the region. This is supported by the fact that in 1981, at the time of the previous relicensing effort, a representative of NGPC's fishery division stated that "in general, the Loup Power system fishery could be described as excellent, and of regional importance to east-central Nebraska" (Rupp, 1981). This view was reiterated by NGPC staff at pre-PAD agency discussions conducted during the summer of 2008. Although NGPC has requested that fish sampling be performed on the Loup Power Canal, it has not identified specific concerns related to the fishery or a reason to believe that the Loup Power Canal fishery has degraded since Rupp's assessment in 1981.

- Sufficient data on the fishery resources of the Loup Power Canal currently exist or are planned to be obtained via other relicensing studies. In 1996 and 1997, NGPC performed a wide-ranging fish sampling and creel survey effort that included the entire Middle Loup and Loup River basins (NGPC, June 1997 and April 1998). During this effort, NGPC performed a creel survey on the Loup Power Canal but did not perform fish sampling. The creel data collected during 1996 and 1997 suggests that the Loup Power Canal receives significant angler use. The creel data could be interpreted to support the health of the Loup Power Canal through the regular use and inferred success by anglers. Consistent with NGPC methodologies, the District intends to perform a creel survey in association with relicensing Study Plan 8.0, Recreational Use.
- No coordinating agencies, including NGPC, identified concerns with the health of the Loup Power Canal fishery or about potential adverse Project effects. As such, FERC did not identify the Loup Power Canal fishery (including measurements of fish species diversity, richness, or abundance) as a Project issue in Scoping Document 2 (FERC, March 2009).

4.3 DISTRICT NON-RELICENSING PROPOSAL

The District understands that fish sampling is an important tool in the successful management of public fisheries. Furthermore, the District actively promotes the use of its facilities for public fishing access; therefore, the District proposes to facilitate NGPC-performed fish sampling at NGPC's convenience and independent of Project relicensing. When NGPC is available to perform fish sampling, the District will accommodate an effort consistent with the *Standard Survey Guidelines for Sampling Lake Fishery Resources* (NGPC, 1985) and/or *Nebraska Fish Community Assessment and Analysis Protocol* (NGPC, 1997). It is anticipated that data collected during fish sampling would be incorporated into the NGPC-administered statewide fish sampling program, the results of which are annually released to the public so that anglers can compare lakes and determine trends at specific sites (NGPC, 2009).

NGPC, in comments provided to the District on June 26, 2009, acknowledged that Study 6.0, Fish Sampling, will not be included as part of Project relicensing. Rather, the District will cooperate with NGPC to provide access for future NGPC-performed sampling.

4.4 REFERENCES

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