

Appendix E

The Omaha Public Power District's Compliance Status and Consultation Correspondence

Appendix E

The Omaha Public Power District's Compliance Status and Consultation Correspondence

The list of licenses, permits, consultations, and other approvals obtained from Federal, State, regional, and local authorities for Fort Calhoun Station, Unit 1 is shown in Table E-1. Following Table E-1 are reproductions of consultation correspondence prepared and sent during the evaluation process of the application for renewing the operating license for Fort Calhoun Station, Unit 1.

Table E-1. Federal, State, Local, and Regional Licenses, Permits, Consultations, and Other Approvals for Current Fort Calhoun Station, Unit 1 Operation

| Agency | Authority | Description | Number | Issue Date | Expiration Date | Remarks |
|--------|---|--|--|----------------|--|--|
| NRC | Atomic Energy Act 10 CFR Part 50 | Operating license | DPR-40 | August 9, 1973 | August 9, 2013 | Authorizes operation of Fort Calhoun Station, Unit 1. |
| FWS | Section 7 of the Endangered Species Act (16 USC 1536) | Consultation | NA | June 5, 2002 | NA | Section 7 requires a Federal agency to consult with the FWS regarding whether a proposed action will affect an endangered or threatened species. The NRC started consultation on June 5, 2002, and is still in consultation with the FWS. |
| NSHS | National Historic Preservation Act, Section 106 | Consultation | NA | | NA | The National Historic Preservation Act requires Federal agencies to take into account the effect of any undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places. |
| NDEQ | Clean Water Act, Section 401 | Certification | NPDES permit constitutes compliance. | | | Discharges during the renewal term |
| NDEQ | Federal Clean Water Act, Section 402 | Industrial waste-water facility permit | NPDES permit NE0000418 | | March 31, 2006 | Contains effluent limits for Fort Calhoun Station, Unit 1 discharges to the Missouri River. |
| NDEQ | Nebraska Statute 81-1513 | Consent order in the matter of Omaha Public Power District – Fort Calhoun Nuclear Station | Case 2206 | | To be determined as conditions are met | Increases maximum discharge temperature limits from 43.3 °C (110 °F) to 44.4 °C (112 °F). |

Table E-1 (contd)

| Agency | Authority | Description | Number | Issue Date | Expiration Date | Remarks |
|--------|---------------------------|-------------------------------------|---|------------|-------------------|--|
| NGPC | Nebraska Statute 37-418 | Scientific collecting master permit | Master permit 168 | | December 31, 2003 | Collection of fish species (for radiological environmental monitoring programs) |
| NDNR | NAC Title 457 | Surface-water authorization permits | D-1083, D-1100 | | Indefinite | Permits withdrawal of water from the Missouri River. Approval for up to approximately 1,400,000 L/min (370,000 gpm). |
| NDNR | NAC Title 456, Chapter 12 | Groundwater well registrations | G-109801A-E, G-109802, G-109803, G-110639 | | Indefinite | One-time registration of onsite groundwater wells |

FWS – U.S. Fish and Wildlife Service
 NSHS – Nebraska State Historical Society
 NDEQ – Nebraska Department of Environmental Quality
 NGPC – Nebraska Game and Parks Commission
 NDNR – Nebraska Department of Natural Resources
 NAC – Nebraska Administrative Code

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Appendix E

June 5, 2002

Mr. Steve Anschutz
U.S. Fish and Wildlife Service
Ecological Services Office
203 W. Second Street
Federal Building, 2nd Floor
Grand Island, Nebraska 68801

SUBJECT: REQUEST FOR LIST OF PROTECTED SPECIES WITHIN THE AREA UNDER
EVALUATION FOR THE FORT CALHOUN NUCLEAR STATION LICENSE
RENEWAL

Dear Mr. Anschutz:

The Nuclear Regulatory Commission (NRC) is evaluating an application submitted by Omaha Public Power District for the renewal of the operating license for its Fort Calhoun Nuclear Station Unit 1. The NRC is preparing a supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (NUREG-1437) for this proposed license renewal, for which we are required to evaluate potential impacts to threatened and endangered species.

Fort Calhoun Station Unit 1 is located in Washington County, Nebraska on the southwestern bank of the Missouri River at river mile 646 (Figures 1 and 2). The Fort Calhoun site consists of approximately 660 acres most of which is cropland or developed facility areas. Areas of natural vegetation on the site consist mostly of highly disturbed woodlands and shrub land on the steep slopes in the southern portion of the site and riparian woodlands along onsite sloughs bordering the Missouri River.

The proposed action would include use and continued maintenance of existing plant facilities and transmission line and would not result in new construction or disturbance. The 7-mile-long transmission-line corridor passes through mostly cropland and connects to a substation west of Blair, Nebraska. Cooling water for the Fort Calhoun Station is withdrawn from the Missouri River to supply once-through cooling water to remove heat from the main condensers. Maximum water withdrawal for the plant during normal operation is approximately 371,000 gallons per minute.

To support the environmental impact statement preparation process and to ensure compliance with Section 7 of the Endangered Species Act, the NRC requests a list of species and information on protected, proposed, and candidate species and critical habitat that may be in the vicinity of the Fort Calhoun Nuclear Station and its associated transmission line.

S. Anschutz

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If you have any comments or questions, please contact Mr. Thomas Kenyon, Environmental Project Manager, at (301) 415-1120.

Sincerely,

Original Signed By: PTKuo

Pao-Tsin Kuo, Program Director
License Renewal and Environmental Impacts Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Enclosure: As stated

Docket No. 50-285

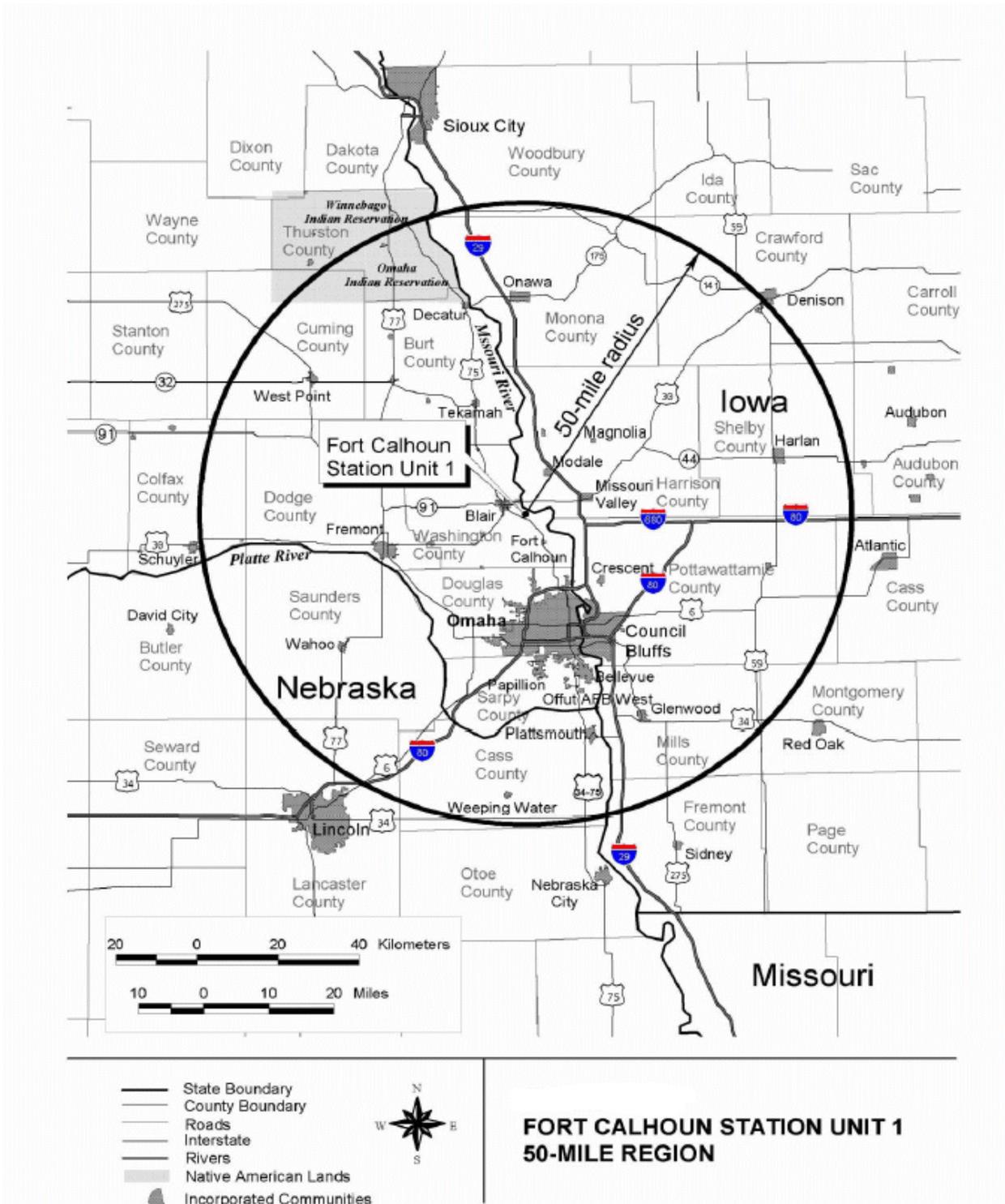


Figure 1. Location of Fort Calhoun Station, Unit 1, Nebraska.

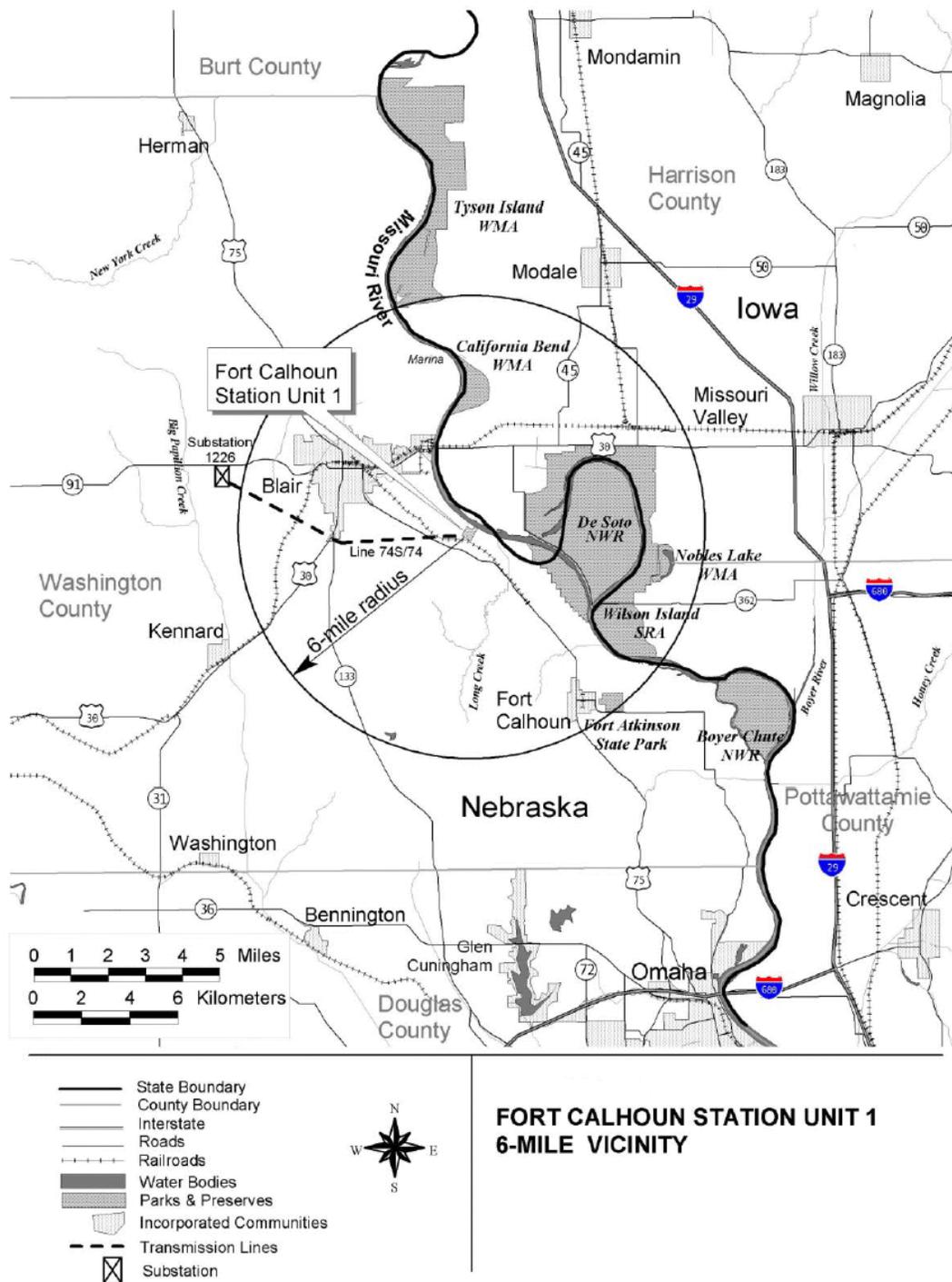


Figure 2. Vicinity of Fort Calhoun Station, Unit 1 and transmission line.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
Nebraska Field Office
203 West Second Street
Grand Island, Nebraska 68801

September 26, 2002

U.S. Nuclear Regulatory Commission
Document Control Center
Attn: Mr. Pao-Tsin Kuo, Program Director
Washington D.C 20555-0001

RE: Request for List of Protected Species within the Area under Evaluation for the Fort Calhoun Nuclear Station License Renewal

Dear Mr. Kuo:

This is in response to your June 5, 2002, request for comments from the U.S. Fish and Wildlife Service (Service) regarding a proposed license renewal for the Fort Calhoun Nuclear Station (FCNS) which is located in Washington County, Nebraska on the southwestern bank of the Missouri River at river mile 646. The Service has completed its preliminary review of the proposed license renewal based on project details provided to this office and discussions at a June 20, 2002, meeting. The proposed action would include continued use and maintenance of existing plant facilities and a 7-mile transmission line. The 7-mile-long transmission line corridor passes through mostly cropland and connects to a substation located west of Blair, Nebraska. Water for the FCNS is drawn from the Missouri River to remove heat from cooling condensers at the station. No new construction is proposed as part of the license renewal. The Nuclear Regulatory Commission (NRC) is preparing a supplement to its "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" for this proposed license renewal.

AUTHORITY

The following comments are intended to assist the NRC in its planning efforts and are provided as technical assistance to ensure the protection of Federal trust fish and wildlife resources, including federally listed species pursuant to the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*), migratory birds pursuant to the Migratory Bird Treaty Act (16 U.S.C. 701 *et seq.*) and other fish and wildlife resources under the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401; 16 U.S.C. 661 *et seq.*). The Service participates in scoping and review of actions significantly affecting the quality of the environment under authority of the National Environmental Policy Act (NEPA) (42 U.S.C. 4321-4347). Additionally, the Service has authorities under several other legislative, regulatory, and executive mandates to promote conservation of fish and

wildlife resources for the benefit of the public. Please note that these comments do not constitute a report by the Secretary under the FWCA, nor does it absolve Federal agencies from meeting their responsibilities under Section 7 of ESA.

In Nebraska, the Service has special concerns for migratory birds, endangered and threatened species, and other important fish and wildlife resources. We also are concerned about any direct and/or indirect impacts on Federal and State wildlife refuges and management areas and other public lands, and other areas that support sensitive habitats. Habitats frequented by important fish and wildlife resources include wetlands, streams, and riparian (streamside) forests and woodlands. We give special attention to proposed developments that propose modification of wetlands, or stream alteration, or could result in contamination of important habitats. The Service recommends ways to avoid, minimize, rectify, reduce, or compensate for damaging impacts to important fish and wildlife resources and their habitats that may be attributed to actions proposed by Federal agencies.

FEDERALLY LISTED SPECIES AND DESIGNATED/PROPOSED CRITICAL HABITAT

Pursuant to Section 7 of ESA, every Federal agency, in consultation or conference with the Service, is required to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any Federally listed or proposed species and/or result in the destruction or adverse modification of designated and/or proposed critical habitat. In accordance with Section 7(a)(2) of ESA, the Federal agency should determine if any federally listed/proposed threatened or endangered species and/or designated/proposed critical habitat would be directly and/or indirectly affected by the proposed project. The assessment of potential impacts (direct and indirect) must include an "affect" or "no effect" determination and be presented to the Service in writing. If the Service agrees with the determination made by the Federal agency, this office would provide a letter of concurrence. If federally listed/proposed species and/or designated/proposed critical habitat would be adversely affected by the proposed project, the federal agency will need to formally request further Section 7 consultation with the Service prior to making any irretrievable or irreversible commitment of federal funds (Section 7 (d) of ESA), or issuing any federal permits or licenses.

In accordance with Section 7 of ESA, the Service has determined that the following federally listed and candidate species may occur in the proposed project area or be affected by the proposed project:

| <u>Listed Species</u> | <u>Expected Occurrence</u> |
|---|--|
| Bald eagle (<i>Haliaeetus leucocephalus</i>) | Migration, winter |
| Pallid sturgeon (<i>Scaphirhynchus albus</i>) | Lower Platte River and Missouri River |

Bald Eagle

The bald eagle, federally listed as threatened, nests, migrates, and winters statewide. Bald eagles utilize mature, forested, riparian areas near rivers, streams, lakes, and wetlands and occurs along all the major river systems in Nebraska. The bald eagle southward migration begins as early as October and the wintering period extends from December-March. Additionally, many bald eagles nest in Nebraska from mid-February through mid-August. Disturbances within 0.5-mile of an active nest or within line-of-sight of the nest could cause adult eagles to discontinue nest building or to abandon eggs. There is an active bald eagle nest located at Desoto National Wildlife Refuge (NWR) located across the river from the FCNS, but continued operation of the FCNS is unlikely to have an affect on the nest. Human disturbances and loss of eagle wintering habitat can cause undue stress leading to cessation of feeding and failure to meet winter thermoregulatory requirements. These affects can reduce the carrying capacity of preferred wintering habitat and reproductive success for the species. Bald eagles are attracted to the area by the abundance of migratory waterfowl found near the Desoto NWR during the fall and spring migrations. The potential for collisions with transmission lines can increase if lines are located near migration corridors and foraging habitats for bald eagles.

Pallid Sturgeon

The pallid sturgeon was officially listed as an endangered species on September 6, 1990. In Nebraska, the pallid sturgeon is found in the Missouri and lower Platte rivers. Floodplains, backwaters, chutes, sloughs, islands, sandbars, and main channel waters formed the large-river ecosystem that provided macrohabitat requirements for the pallid sturgeon, a species that is associated with diverse aquatic habitats. These habitats historically were dynamic and in a constant state of change due to influences from the natural hydrograph, and sediment and runoff inputs from an enormous watershed spanning portions of 10 states. Navigation, channelization and bank stabilization, and hydropower generation projects have caused the widespread loss of this diverse array of dynamic habitats once provided to pallid sturgeon on the Missouri River, resulting in a precipitous decline in populations of the species. Multiple age classes of pallid sturgeon may be impacted by withdrawal, circulation, and discharge of cooling water through power plants.

Early FCNS Operational Studies

Numerous studies were done in the mid-1970s to ascertain the affects of FCNS on the Missouri River fish community (see Hesse et al. 1982b for a collection of papers). Of particular interest to the Service were studies about the affects of impingement and entrapment on adult and juvenile fish (Hesse et al. 1982a) and entrainment on larval fish (Hergenrader et al. 1982) at FCNS. These studies were particularly valuable for the purpose of establishing a baseline about the fish community of the Missouri River. Detailed statistical analyses were done on the most abundant fish or larvae collected (i.e., freshwater drum (*Aplodinotus grunniens*), carp (*Cyprinus carpio*), and gizzard shad (*Dorosoma cepedianum*) where adequate sample sizes ensured adherence to assumptions of various statistical tests utilized, thus facilitating development of meaningful conclusions. The studies were valuable in terms of providing discussions about the most abundant fish, but limited by study design and sample size from

providing discussions for fish that were rare and/or were rarely collected, such as threatened and endangered fish including the pallid sturgeon. Conclusively, ascertaining cause and effect relationships between even the most abundant fish species and power stations were difficult because of the dynamic nature of the Missouri River.

The Service is unaware of additional work regarding the affects of the water circulation process at FCNS on pallid sturgeon, or if additional data has since been collected that could be compared with the baseline information collected in the studies mentioned above. The cooling water circulation process is selective in its affects by age class or size (i.e., entrainment may affect larvae, but not adult pallid sturgeon; entrapment may affect large adults, but not larvae or juveniles; and impingement may affect juveniles, but not larvae or adults). The Service recommends that the NRC develop and implement a program to monitor the affects of the water circulation process on multiple age classes of pallid sturgeon. To assist the NRC in developing a monitoring program that can support a determination whether cooling water circulation at FCNS may/may not adversely affect the pallid sturgeon, the Service recommends the following considerations be incorporated into the protocol. The following should not be considered as an all-inclusive listing because other considerations also may be valid.

1. Seasonal Affects: Pallid sturgeon and other fish exhibit seasonal habitat shifts. The combined affects of FCNS operational capacity, river characteristics, and seasonal habitat shifts may result in pallid sturgeons being susceptible to impact from the water circulation process. Further, high ambient summer temperatures may exacerbate the affects of heat entrainment on larvae.
2. Daily Affects: Larvae are thought to exhibit a photoperiod response possibly becoming more active at night than day.
3. Operational Affects: High power demand and hence high capacity power production will require a greater volume of water for cooling, exacerbating the affect of entrapment, impingement, and entrainment on fish. These affects may be observable during warm periods of the summer and winter seasons. These affects could have serious implications should increased power production coincide with abundant sturgeon larvae in the drift.
4. River Conditions: Current velocities approaching traveling screens can vary with river level (Schlesinger et al. 1982). Additionally, a greater percentage of the total river flow is required when river volumes are low.
5. Lateral Distribution: Fish are unevenly distributed across the lateral plane of a river due to the influence of current velocity, availability of dissolved oxygen, and presence of aquatic habitat. Thus, although water circulation may draw less than 5 percent of the total flow, that percentage may be from a portion of the lateral river where a large percentage of larvae are found.

6. Longitudinal Distribution: At some times of the year, adult fish may be present in sections of the unchannelized Missouri River between Ponca, Nebraska and Gavins Point Dam. Adults may winter in the middle Missouri River during the winter. Larvae and recently spawned fish may only be present during late spring or early summer.
7. Multiple-year Monitoring: The Service recommends that NRC consider developing and implementing a multiple-year monitoring program as a way to address variability inherent to the Missouri River.

Surrogate Group

Given the rarity of the pallid sturgeon, the Service recommends that the NRC monitor a group of fish with similar life history and habitat requirements. Results from the monitoring project may be used by the NRC to support a “affect/no affect” determination. For example, a suitable group of fish may be composed of shovelnose (*S. platyrhynchus*), lake (*Acipenser fulvescens*), and pallid sturgeons.

Review Monitoring Protocol

The Service would be willing to provide technical assistance with regard to development of the aforementioned monitoring protocol. Additionally, given their extensive experience with the Missouri River fishery, we also would recommend that you coordinate closely with the Nebraska Game and Parks Commission during development of the monitoring protocol.

Affect/No Affect Determination

The Service recommends that NRC consider the information provided above about the bald eagle and pallid sturgeon in making its assessment of potential impacts of the proposed license renewal on federally listed species, and in making the “affect/no affect determination,” as discussed above. Further, the Service recommends that the lead Federal agency not limit its consideration of affect to just the above project information, but other potential affects as they become apparent during the course of other project studies and/or project development and modification.

MIGRATORY BIRD TREATY ACT

Under the Migratory Bird Treaty Act (16 U.S.C. 703-712: Ch. 128 *as amended*), take of migratory birds at transmission lines due to such causes as electrocution and collision is prohibited. Such impacts can be exacerbated if lines are located near foraging, nesting, and roosting habitats, or along migratory corridors. The 7-mile long transmission line is located near such habitats and the Missouri River, a migration corridor for a variety of migratory species. Thus, the Service recommends that the NRC conduct a study of the 7-mile transmission line to determine its affect on migratory birds. Should the study document that the transmission line has a negative affect on migratory birds, we recommend that mitigative measures be developed and implemented to offset such affects. The Avian Powerline

Interaction Committee prepared a useful reference regarding the affects of bird collisions with power lines (APLIC 1994). We recommend that NRC review the reference and use it in the development of the mitigation strategies, if necessary. The Service requests that NRC provide us with a copy of the recommended study once completed for review and comment. The results of such a study would be applicable to the “affect/no affect determination” for bald eagles as discussed above.

The Service appreciates the opportunity to provide comments on the proposed relicensing of FCNS. The NRC’s involvement in assuming a shared responsibility for protecting federal trust fish and wildlife resources in Nebraska is also appreciated. Should you have any questions regarding these comments, please contact Mr. Robert Harms within our office at (308) 382-6468, extension 17.

Sincerely,



Steve Anschutz
Nebraska Field Supervisor

References

Avian Power Line Interaction Committee (APLIC). 1994. *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994*. Edison Electric Institute. Washington, D.C.

Hergenrader, G.L., L.G. Harrow, R.G. King, G.F. Cada, and A.B. Schlesinger. 1982. Larval fishes on the Missouri River and the effects of entrainment. Pages 185-223 *in* Hesse, L.W., G.L. Hergenrader, H.S. Lewis, S.D. Reetz, and A.B. Schlesinger, editors. 1982. *The Middle Missouri River, a Collection of Papers on the Biology with Special Reference to Power Station Effects*. Missouri River Study Group. 301 pp.

Hesse, L.W., Q.P. Bliss, and G.J. Zuerlein. 1982a. Some aspects of the ecology of adult fishes in the channelized Missouri River with special reference to the effects of two nuclear power generating stations. Pages 225-276 *in* Hesse, L.W., G.L. Hergenrader, H.S. Lewis, S.D. Reetz, and A.B. Schlesinger, editors. 1982. *The Middle Missouri River, a Collection of Papers on the Biology with Special Reference to Power Station Effects*. Missouri River Study Group. 301 pp.

Hesse, L.W., G.L. Hergenrader, H.S. Lewis, S.D. Reetz, and A.B. Schlesinger, editors. 1982b. *The Middle Missouri River, a Collection of Papers on the Biology with Special Reference to Power Station Effects*. Missouri River Study Group. 301 pp.

Schlesinger A.B., L.J. Cooper, and L.G. Harrow. 1982. Introduction. Pages 1-13 *in* Hesse, L.W., G.L. Hergenrader, H.S. Lewis, S.D. Reetz, and A.B. Schlesinger, editors. 1982. *The Middle*

Missouri River, a Collection of Papers on the Biology with Special Reference to Power Station Effects. Missouri River Study Group. 301 pp.

cc: USFWS; Desoto NWR (Attn: Larry Klimek)
USFWS; Boyer Chute NWR (Attn: Brian Schultz)
NGPC; Lincoln, NE (Attn: Frank Albrecht)
NGPC; Lincoln, NE (Attn: Gene Zuerlein)
NGPC; Lincoln, NE (Attn: Julie Godberson)
NDEQ; Lincoln, NE (Attn: John Bender)
EPA; Kansas City, KS (Attn: Larry Long)

December 9, 2002

Mr. Steve Anschutz
U.S. Fish and Wildlife Service
Ecological Services Office
203 W. Second Street
Federal Building, 2nd Floor
Grand Island, Nebraska 68801

SUBJECT: BIOLOGICAL ASSESSMENT FOR LICENSE RENEWAL AT FORT CALHOUN
STATION, UNIT 1, AND REQUEST FOR INFORMAL CONSULTATION
(TAC NO. MB3402)

Dear Mr. Anschutz:

The NRC staff has prepared the enclosed biological assessment to evaluate whether the proposed renewal of the Fort Calhoun Station, Unit 1, operating license for a period of an additional 20 years would have adverse effects on listed species. This biological assessment covers the area of the Fort Calhoun Station, located in Washington County, Nebraska, on the southwestern bank of the Missouri River at River Mile 646 and the 7-mile-long transmission line corridor connecting to a substation west of Blair, Nebraska.

There are five threatened or endangered species; the pallid sturgeon, bald eagle, western prairie fringed orchid, piping plover, and least tern addressed in the attached biological assessment. The staff has determined that the proposed action is not a major construction activity and that it may affect, but is not likely to adversely affect, the pallid sturgeon and the bald eagle. It will have no effect on the remaining three species. No designated critical habitat for any of these five listed species is located near the proposed action. We are placing this biological assessment in our project files and are requesting your concurrence with our determination.

In reaching our conclusion, the NRC staff relied on the geographical information system data base information provided by the Nebraska Natural Heritage Programs and on research performed by the NRC staff and contractors, and a current listing of species provided by the Nebraska field office of the Fish and Wildlife Service.

Appendix E

S. Anschutz

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If you have any questions regarding this biological assessment or the staff's request, please contact the license renewal project manager, Jack Cushing, by telephone at (301) 415-1424 or by e-mail at jxc9@nrc.gov.

Sincerely,

/RA/

Pao-Tsin Kuo, Program Director
License Renewal and Environmental Impacts
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No.: 50-285

Enclosure: As Stated

**BIOLOGICAL ASSESSMENT OF THE POTENTIAL IMPACTS
TO THREATENED AND ENDANGERED SPECIES
RESULTING FROM AN ADDITIONAL 20 YEARS OF OPERATION
OF THE FORT CALHOUN STATION, UNIT 1, NUCLEAR POWER PLANT**

Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

December 2002

I. INTRODUCTION

The U.S. Nuclear Regulatory Commission (NRC) is considering an application for renewal of the operating license for the Omaha Public Power District (OPPD) Fort Calhoun Station, Unit 1, (FCS) nuclear power plant for an additional 20 years. The purpose of this assessment is to provide information to the U.S. Fish and Wildlife Service (FWS) concerning the potential impacts of continued operation of FCS, Unit 1, on threatened and endangered species; the pallid sturgeon (*Scaphirhynchus albus*), bald eagle (*Haliaeetus leucocephalus*), western prairie fringed orchid (*Platanthera praeclara*), piping plover (*Charadrius melodus*), and the least tern (*Sterna antillarum*). The assessment summarizes pertinent project information and existing data and discusses the potential consequences of the proposed action on these species. Based on life history information, habitats in the project area and along Line 74S/74, operational characteristics of the plant, existing data for impingement and entrainment, and known thermal plume characteristics, the staff concludes that continued operation of FCS during the proposed 20-year license renewal period may affect, but is not likely to adversely affect, either the pallid sturgeon or bald eagle and will have no effect on the western prairie fringed orchid, piping plover, or the least tern.

II. PROJECT DESCRIPTION

The proposed action includes the continued operation and maintenance of FCS on the Missouri River in eastern Nebraska, approximately 31 kilometers (km) (19 miles [mi]) north-northwest of downtown Omaha (Figure 1), under a renewed license from the NRC. FCS began commercial operation on August 9, 1973, and is currently licensed to operate through August 9, 2013 (OPPD 2002). NRC regulations (10 CFR Part 54) allow license renewal for periods of up to 20 years, which would extend the operation of FCS through August 9, 2033. All facilities associated with this action were constructed during the early 1970s and no new construction would be performed as part of the license renewal action (OPPD 2002).

III. DESCRIPTION OF PROJECT AREA

FCS is a nuclear-powered steam electric generating facility operated by OPPD. The facility is located in Washington County, Nebraska, on the southwestern bank of the Missouri River at River Kilometer (RK) 1040 (River Mile [RM] 646), approximately 266 km (165 mi) downstream of Gavins Point Dam. It is approximately 31 km (19 mi) north-northwest of downtown Omaha, Nebraska, and approximately 16 km (10 mi) north of the Omaha metropolitan area. The nearest municipality to the site is Blair, Nebraska, approximately 4.8 km (3 mi) northwest (upstream) (Figure 1) (OPPD 2002).

The FCS site consists of approximately 267 hectares (ha) (660 acres [ac]) situated between U.S. Highway 75 and the Missouri River. Of this total, 55 ha (135 ac) are occupied by plant facilities or maintained as part of plant operations with an additional 140 ha (345 ac) used for cropland (corn and soybeans). The remaining 73 ha (180 ac) consist of a railroad spur, natural vegetation, and drainage courses. Areas of natural vegetation on the site consist mostly of highly disturbed woodlands and shrubland on the steeper slopes in the southern portion of the site and riparian woodlands along onsite sloughs bordering the Missouri River (OPPD 2002).

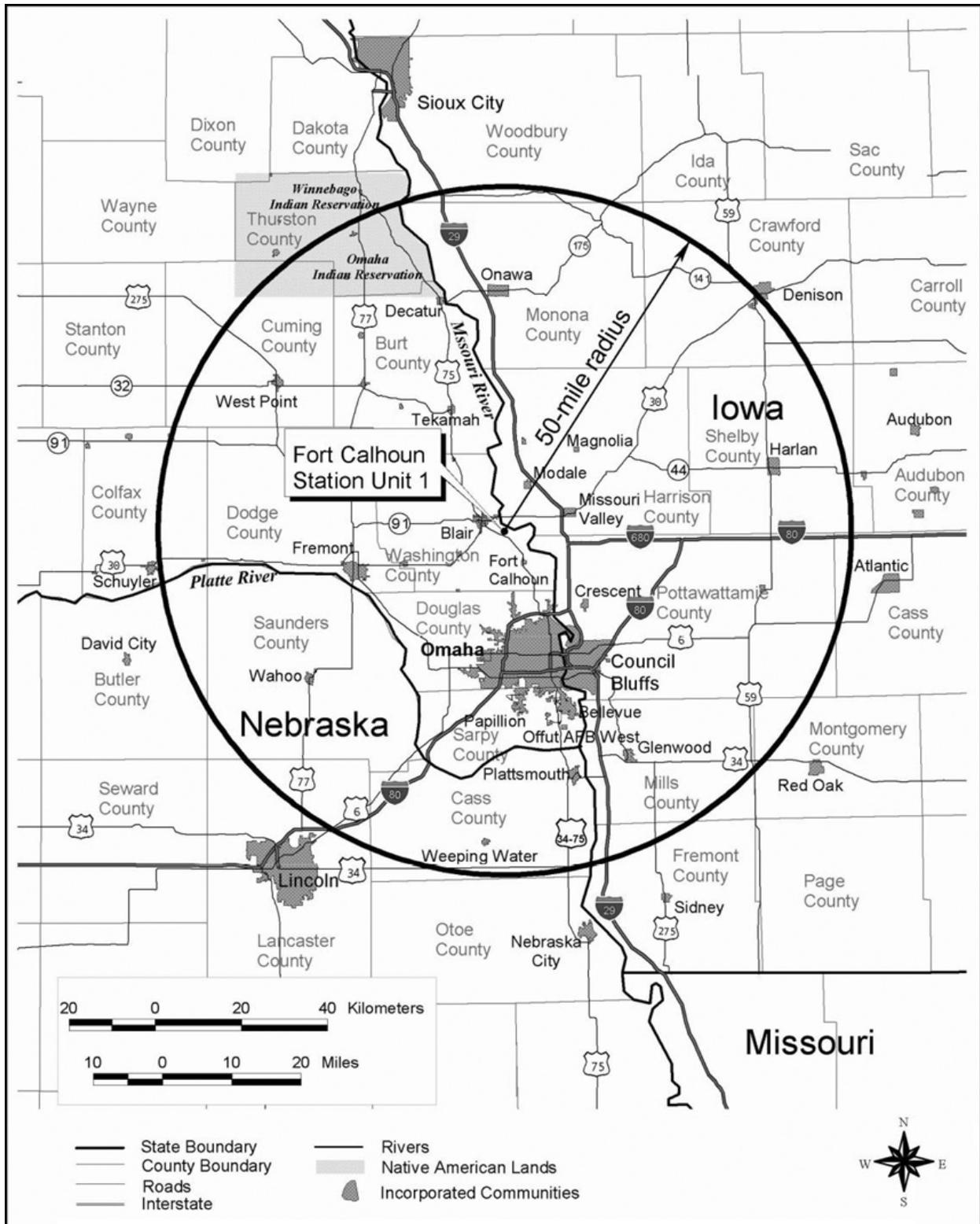


Figure 1. Location of the Fort Calhoun Station, Unit 1, Site

Appendix E

FCS is equipped with a nuclear steam supply system, consisting of a pressurized water reactor and its associated coolant system supplied by Combustion Engineering. The reactor was initially licensed to operate at a maximum power level of 1420 megawatt-thermal. It is currently licensed for a thermal power level of 1500 megawatt-thermal with an electrical power output of 510 megawatts-electrical and a net generating capability of the plant (i.e., electric power supplied to the grid) of 476 megawatts (summer rating). FCS generates approximately 3.6 terawatt-hours of electricity annually (OPPD 2002).

The transmission line of concern for license renewal is that which was constructed between the plant switchyard and the existing transmission system. For FCS, the only transmission line within the scope of review for license renewal is Line 74S/74, which is a 161 kV line that is approximately 11 km (7 mi) long and proceeds from the FCS Substation westward to Substation 1226, approximately 4 km (3 mi) west of Blair, Nebraska. This line is composed of two segments. Line 74S is a 1 km (0.5 mi) long, single-circuit line on a 15 m (50 ft) wide right-of-way. Line 74 is a 10 km (6.5 mi) long double-circuit line on a 100 ft right-of-way. Line 74S/74 was originally constructed in 1969 and provided a connection to the transmission grid once the plant became operational. The line was entirely reconstructed in 1999 to single steel poles and to the 1997 National Electrical Safety Code requirements that were in effect at the time.

Leaving the FCS Substation, Line 74S/74 traverses (for approximately 1.6 km or 1 mi) disturbed shrublands and woodlands, primarily on the hilly upland terrain of the Missouri River bluffs in the vicinity of U.S. Highway 75. For the remaining 9.7 km (6 mi) to the Blair Substation, this line is routed across agricultural cropland. The line crosses several small intermittent streams, but no other surface waters or wetlands are crossed. Land use adjacent to the right-of-way has undergone little change since initial construction; however, some additional development has occurred along U.S. Highway 30 near the line crossing, and new rural residential development has occurred along the north side of the line for approximately 1.2 km (0.75 mi) in the bluff area just west of U.S. Highway 75 (OPPD 2002).

FCS uses a once-through, non-contact system for cooling that withdraws water from an intake structure on the shoreline of the Missouri River and discharges to the river through a discharge tunnel 12.2 m (40 ft) downstream from the intake structure. The intake structure is contained within a reinforced concrete building that extends approximately 24.4 m (80 ft) along the riverbank at RK 1039 (RM 646). Maximum cooling water withdrawal for the plant during normal operation is approximately 371,000 gal/min (827 ft³/s or 534 million gal/d) (OPPD 2002).

Average Missouri River flow rates measured at the gaging station in Omaha for the period between 1967 and 2000 provide an approximation of flow conditions at the FCS site. During the summer, the lowest monthly average flow rate occurs in August and is 1209 m³/s (42,679 ft³/s) with a monthly minimum flow rate of 861 m³/s (30,409 ft³/s). The maximum water intake at FCS during normal plant operations is 23 m³/s (827 ft³/s) and occurs during the summer due to higher river temperatures. This maximum water intake represents approximately two percent of the monthly average and 2.8 percent of the minimum river flow at that time. The lowest average river flows occur during the winter, with a monthly average flow rate of 594 m³/s (20,982 ft³/s) and a monthly minimum flow rate of 313 m³/s (11,060 ft³/s) occurring in January. The normal water intake for FCS represents approximately 3.9 percent of the average and seven percent of the minimum river flow during this winter month (OPPD 2002).

At extreme low-flow conditions within the river (i.e., at a river surface elevation of 298 m or 978 ft), the average velocity of intake water through the sluice gates of the facility's intake structure is 0.9 m/s (2.8 ft/s). During low-flow conditions (i.e., at a river surface elevation of 300 m or 983 ft), the estimated approach velocity to the intake structure's traveling screens, located approximately 2.4 m (8 ft) beyond the sluice gates, is 0.34 m/s (1.1 ft/s). At normal river level conditions of approximately 302 m (992 ft), the estimated average approach velocity to the traveling screens is 0.2 m (0.7 ft/s) (OPPD 2002).

The reach of the Missouri River, on which FCS is located, has been modified through its entire length by a system of dikes and revetments designed to provide a continuous navigation channel without the use of locks and dams. The Missouri River at the site is approximately 183 m (600 ft) wide and 4.6 m (15 ft) deep. The banks are stabilized by filling-dams along the east bank and riprap along the west-cutting bank where plant facilities are located. The river bottomlands at the plant site are approximately 16 km (10 mi) wide. Agriculture is the predominant land use outside of incorporated areas in the upland region beyond the Missouri River bottomlands. The Platte River joins the Missouri River approximately 56 km (35 mi) south of the FCS site. There are two small streams on or adjacent to the site — Fish and Long Creeks (OPPD 2002).

IV. DESCRIPTION OF SPECIES IN PROJECT AREA

A. Pallid Sturgeon

The pallid sturgeon (*Scaphirhynchus albus*) was originally listed as endangered throughout its entire range by the FWS in 1990 due to a rapidly declining population (55 FR 36641 [FWS 1990]). The species continues to decline and is nearly extirpated from large segments of its former range and is only occasionally observed (FWS 2000).

The pallid sturgeon's historic range encompassed 5633 river km (3500 river mi) and was comprised of the Yellowstone, Missouri, middle and lower Mississippi Rivers, and the lower reaches of their major tributaries (i.e., the Platte, Kansas, and Yellowstone Rivers) (55 FR 36641 [FWS 1990]; FWS 2000). It is one of the largest fish species in the Missouri River, and grows to a length of over 1.8 m (6 ft), attains a weight of 45 kg (100 lbs), and has a lifespan of 60 years (55 FR 36641 [FWS 1990]; FWS 2000; FWS 2002a). This slow-growing and late-maturing species has a flattened, shovel-shaped snout, bony plate, and a long, reptile-like tail (FWS 2002a).

A sharp decline in pallid sturgeon observations occurred after the 1960s and over the entire range of the species, especially from the Gavins Point Dam to the Missouri River's headwaters. This decline continues and is largely a result of habitat modification, either directly (e.g., reduction of habitat diversity) or indirectly (e.g., alteration of food sources). Commercial fishing of a closely related species, the shovelnose sturgeon (*Scaphirhynchus platyrhynchus*), may also negatively impact the pallid sturgeon and this potential threat continues as the value of sturgeon roe increases (Davis 2000). Over the entire species' range, an average of 50 observations per year of the pallid sturgeon occurred in the 1960s with a subsequent decreasing trend. An average of 21 observations per year was noted in the 1970s and an average of seven observations per year in the 1980s (55 FR 36641 [FWS 1990]).

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This represents an approximate 86 percent decline in observations of the pallid sturgeon over its entire range in 30 years.

Since 1980, the most frequent observations of this species were in the Missouri River. Relatively more frequent observations of the pallid sturgeon have been made near the mouth of the Platte River close to Plattsmouth, Nebraska (about 56 km or 35 mi downstream of FCS). Approximately 10 percent of the 872 observations of pallid sturgeon through 1998 have been made in the Missouri River below Gavins Point Dam (FWS 2000).

The pallid sturgeon feeds on snails, small fish, aquatic insects and plants, and other food resources from the river bottom. It requires large, turbid, and free-flowing habitat within rivers with a rocky or sandy substrate. The pallid sturgeon inhabits areas with swift-moving water (55 FR 36641 [FWS 1990]); bottom velocity in occupied areas range from 0.0 to 1.37 m/s (0 to 4.5 ft/s). The species inhabits areas with water temperatures between 0 °C (32 °F) and 30 °C (86 °F) (FWS 2000).

Macrohabitat requirements of the pallid sturgeon include floodplains, backwaters, chutes, sloughs, islands, sandbars, and main channel waters (FWS 2000). The average home range size of adults is estimated to be approximately 78.5 km (48.8 mi) in the upper Missouri River. Differences in movement patterns are influenced by seasonal factors (i.e., temperature and discharge) as well as differences between spawning and non-spawning years. Because the pallid sturgeon is a large fish, it is capable of moving large distances as it seeks favorable habitat. This produces a maximum home range of approximately 319 km (198 mi) with the pallid sturgeon capable of moving up to 21 km (13 mi) a day (FWS 2000).

Pallid sturgeon spawning is thought to be similar to that of other sturgeon species. Based on behavior of the closely related shovelnose sturgeon and some recent observations of successful pallid sturgeon spawning, it is believed that spawning occurs over rock, rubble, or gravel substrate in the main channel of the Missouri River and its major tributaries such as the Platte River. The optimum temperature for pallid sturgeon spawning is estimated to range from 16 to 18.3 °C (60 to 65 °F) (FWS 2000). Spawning occurs during the spring and early summer in the Missouri River; in the middle Missouri River area, spawning is thought to occur primarily in May and June. Sturgeon spawn multiple times during this spring or early-summer period. They release their eggs at intervals in deep channels or rapids without further parental attendance. The eggs are demersal and adhesive and, therefore, not likely to drift downstream.

Larvae become buoyant or active immediately after hatching and may drift downstream. The behavior of young pallid sturgeon is poorly understood; however, recent research points to a downstream movement of larvae that begins immediately at hatching and continues for up to 13 days (FWS 2000). Scientists have used this information, in combination with water velocities, to estimate that larval pallid sturgeon may drift in the water column for a distance of 64 to 644 km (40 to 400 mi).

Recent pallid sturgeon recovery efforts include augmentation of its populations by releases of hatchery-reared fish. Despite such efforts, pallid sturgeon observations remain infrequent or rare. Similarly, evidence of successful reproduction and recruitment throughout its range is rare. However, recent collections of three pallid sturgeon larvae from the lower Missouri River indicate that suitable spawning habitat and hydrologic conditions remain in the lower Missouri

River below Gavins Point Dam or in the Platte River. Although collection efforts in the Missouri River have yielded these few pallid sturgeon larvae, their relative number to other species of collected larvae suggest that spawning success and larval abundance for the pallid sturgeon remains low (FWS 2000).

The Natural Heritage Program documented one occurrence of the pallid sturgeon in the Missouri River for Washington County, upstream of FCS, in 1985. Other occurrences have been documented further upstream (i.e., Burt County, two occurrences, one in 1995 and one in 1996) and downstream (i.e., Douglas County, one occurrence in 1992; Sarpy and Cass Counties, six occurrences, one each occurring in 1984, 1987, 1991, 1995, 2000, and 2001). All of these occurrences are within an 80.5 km (50 mi) radius of the FCS site (NGPC 2001). No pallid sturgeon have been observed at nearby DeSoto National Wildlife Refuge (FWS 2001).

Human activities have modified or eliminated most of the habitat and ecosystem conditions in the Missouri River to which the pallid sturgeon is adapted. The Missouri River underwent extensive modification resulting in 36 percent of its habitat inundated with reservoirs, 40 percent channelized, and 24 percent altered due to dam operations (FWS 2000). The FCS site is located within a reach of the Missouri River that has been channelized, with a relatively uniform width and swift current. This channel degradation results in a reduction of sediment and organic matter, flow modifications, and channel narrowing. These conditions result in unfavorable habitat for the pallid sturgeon. With the current overall water management regime of the Missouri River (i.e., without increased flows and with warmer water temperatures, between June and July), it is believed that the cues for spawning are no longer present (FWS 2000).

B. Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) was originally listed as endangered by the FWS in 1978, but population increases prompted downlisting to threatened status in 1995. Recovery goals for the species have generally been met or exceeded within the species range. In addition, population trends indicate that the bald eagle has recovered and is no longer in danger of extinction, nor is it likely to become in danger of extinction within the foreseeable future throughout all or a significant portion of its range. As a result, the bald eagle was proposed for delisting in 1999 (64 FR 36453 [FWS 1999]).

The bald eagle commonly nested along the Missouri River in Nebraska in the late 1800s (Nebraska Game and Parks Commission [NGPC] Undated a). Although bald eagles have built and attended many nests in Nebraska since the mid-1980s, few young have been successfully fledged. The wintering population of bald eagles in Nebraska is variable and has ranged from about 400 in 1984 to 1300 in 1992.

Bald eagles usually occur near large bodies of water, especially rivers, lakes, and reservoirs that provide a reliable food source and isolation from human disturbance. Large trees and snags along shorelines are used as perches and nest sites. During the fall and spring migrations, when most water is ice-free and milder weather conditions predominate, bald eagles may be seen along virtually any waterway or impoundment in Nebraska (NGPC Undated a). During the wintering period (December 15 to February 20), bald eagles

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usually concentrate in areas where water remains free of ice and food is available. Bald eagles feed on fish and waterfowl.

The bald eagle is a common visitor to DeSoto National Wildlife Refuge, approximately 3km (2 mi) to the east of FCS, in the spring and fall, but has never successfully nested there (FWS 2001). Bald eagles nest along the Missouri River, and there is some potential for occurrence of nests along the river in Washington County. However, no bald eagle nests exist on the FCS site, and none are known to occur in the vicinity (OPPD 2002). Bald eagles were observed in the vicinity of the FCS during field surveys conducted in 1975 (OPPD 2002). Small numbers of migrants or winter visitors are occasionally observed on and near the site along the Missouri River and perch in the large cottonwoods that are present in floodplain areas. Occurrence of bald eagles along Line 74S/74 has not been documented and is not expected because that line does not cross the Missouri River or any other water bodies where bald eagle activities would occur. Further, the line crosses predominantly agricultural land and is near U.S. Highway 75 and residential development.

C. Other Species

Other Federally listed species that occur in eastern Nebraska are the western prairie fringed orchid, piping plover, and least tern. None of these species are likely to occur in the vicinity of the FCS site, as discussed below.

Western Prairie Fringed Orchid

The western prairie fringed orchid (*Platanthera praeclara*) is Federally listed as threatened. The species is a component of the North American tallgrass prairie and is found most often on unplowed calcareous prairies and sedge meadows (FWS 1996). It is dependent on sites with near-surface groundwater and consistently high soil moisture. The orchid will colonize disturbed prairies, but will persist only if the site reverts to prairie (NGPC Undated b). Its historic range in Nebraska included most of the eastern portion of the State. Current known populations of the western prairie fringed orchid in Nebraska are small and occur in Lancaster County near Lincoln, eastern Seward County, Hall County near Grand Island, and in several widely scattered populations in east-central Cherry County (NGPC Undated b).

The main cause of the decline in populations of the western prairie fringed orchid is loss of habitat (NGPC Undated b). Drainage projects, stream channelization, and irrigation withdrawals from shallow aquifers have depleted groundwater and reduce habitat suitability for this species. Agricultural practices such as annual tilling, overgrazing, and annual cutting during the growing season threaten existing populations.

Although the western prairie fringed orchid historically occurred in Washington County, no populations are known to occur in the county at present (FWS 1996). It is unlikely that the species occurs on or near the FCS site or along Line 74S/74 because of the lack of prairie and wetland habitat in these areas.

Piping Plover

The piping plover (*Charadrius melodus*) is Federally listed as threatened in Nebraska. The piping plover breeding habitat consists of open sparsely vegetated areas with alkali or unconsolidated substrates (67 FR 57638 [FWS 2002b]). In the northern Great Plains, piping plovers primarily breed in alkali lakes and wetlands, inland lakes, reservoirs, and rivers. In Nebraska, the piping plover historic breeding range included sandbars and beaches of the Missouri River and its tributaries (NGPC Undated c). Unvegetated sandbars in unchannelized reaches of the Missouri River along the northern border of the State currently provide some nesting habitat. Nesting also occurs along the Niobrara, Platte, and Loup Rivers; these three rivers are designated as critical habitat for this species (67 FR 57638 [FWS 2002b]). There is no designated critical habitat for the piping plover in the vicinity of the FCS site.

Water development, especially the damming and channelization of rivers, has eliminated the natural hydrologic cycles that created and maintained sandbar-nesting habitat. Reductions of annual peak flows have resulted in vegetation encroachment of sandbars and sediment trapped behind dams no longer contribute to downstream sandbar formation (FWS 2000). The result is a reduction in the availability of suitable sandbar nesting habitat for piping plovers.

Suitable sandbar habitat is not found in the FCS reach of the Missouri River. Piping plovers were formerly found at the nearby DeSoto National Wildlife Refuge (FWS 2001), but the last piping plover was seen there in 1977. Suitable habitat in the area has been lost to river channel modifications and regulated water releases from upstream dams.

Least Tern

The least tern (*Sterna antillarum*) is Federally listed as endangered. The historic nesting distribution of the least tern in Nebraska included unvegetated sandbars and beaches along the Missouri River and its tributaries, including the Niobrara, Platte, Loup, and Elkhorn Rivers (NGPC Undated d). This species occurs in habitats similar to those used by the piping plover as described above. Suitable riverine nesting habitats are dry, flat, sparsely vegetated sand and gravel bars that occur in a wide river channel. Like the piping plover, impoundments, river regulation, and channelization projects have greatly reduced or eliminated suitable nesting habitat.

Suitable sandbar habitat for the least tern does not occur in the FCS reach of the Missouri River. Least terns nested at the nearby DeSoto National Wildlife Refuge up to the 1970s, but are now observed only occasionally, even though formerly used nesting habitats at the refuge have been maintained (FWS 2001).

V. EFFECTS OF THE PROPOSED ACTION ON LISTED SPECIES

This section presents the anticipated effects of the proposed action on listed species in the vicinity of the FCS site. As discussed above, only the pallid sturgeon and bald eagle potentially occur in the vicinity of the site and are, therefore, the focus of this assessment. No designated critical habitat for these species exists in the area and no impacts to such habitat are anticipated.

A. Pallid Sturgeon

OPPD implemented an impingement and entrainment monitoring plan at the FCS intake during 1974-5. The program monitored fish impingement on FCS traveling screens, fish larvae in the Missouri River, and fish larvae entrained into the plant cooling-water systems. Based on the small percentage of fish larvae entrained, the fish taxa collected, few adult fish impinged, and the high natural mortality of fish during early life stages, the study concluded that impingement and entrainment at FCS would have minimal adverse effects on the fish populations in the stretch of the Missouri River near the FCS site. The Nebraska Department of Environmental Control (NDEC) reviewed and approved this report on January 19, 1977, concluding that the losses due to impingement and entrainment at FCS were within the acceptable range. The OPPD continued to conduct larval impingement and entrainment studies at FCS through 1977 and summarized the results of the entire program, which spanned the period from 1973 to 1977, in a comprehensive report. No adult, juvenile, or larval pallid sturgeon were collected during these impingement and entrainment monitoring studies (OPPD 1978; 2002).

FCS is sited, designed, and operated to minimize potential impacts to aquatic organisms such as the pallid sturgeon. There is scientific concern that the pallid sturgeon cannot reproduce in channelized habitats (Hesse 1995). FCS is located in a river reach that is entirely channelized and it is unlikely that spawning occurs in the vicinity of the facility. In addition, FCS operation withdraws a relatively low percentage of the total river flow during the summer (two percent of the monthly average flow and 2.8 percent of the minimum flow) when larval drift is occurring. The highest percentage of river flow is withdrawn at the FCS site in the winter (OPPD 2002) when neither spawning nor larval drift occurs.

The NGPC noted that the severe alteration of the Missouri River ecosystem has resulted in the near elimination of the pallid sturgeon from the river (NGPC 1992). Despite more recent habitat restoration projects and population augmentation efforts, the pallid sturgeon continues to decline (Krentz 2002; FWS 2000) and occurrences of this fish remain rare (FWS 2000; NGPC 2001). The lack of suitable habitat in the vicinity of the FCS site as a result of previous habitat modification and the rare documented occurrence of the pallid sturgeon, including larvae (FWS 2000), indicate a low potential for impingement or entrainment with the cooling water system associated with FCS.

Based on this review, the staff concludes that the continued operation of FCS for an additional 20 years may affect, but is not likely to adversely affect the pallid sturgeon.

B. Bald Eagle

Bald eagles occur in the vicinity of the FCS site predominantly during spring and fall migrations and during the winter. Continued operation of FCS could affect bald eagles if plant operations resulted in changes to conditions in the Missouri River that affected food availability (i.e., the availability of fish or waterfowl) or if Line 74S/74 presented a hazard to the eagle.

Discharges of heated water to the Missouri River during plant operation result in warmer water in the outfall area, and, during the winter, the resulting open water can attract eagles that would otherwise migrate further south. This additional open water increases food availability for bald eagles during the winter and represents a benefit to eagles.

Only one transmission line (Line 74S/74) is associated with FCS and is within the scope of the license renewal application review. On the basis of its design, location, and surrounding habitats, it is unlikely that the line could adversely affect the bald eagle. Line 74S/74 is an 11 km (7 mi) long 161 kV line that was completely reconstructed in 1999 to National Electrical Safety Code requirements that include configuration standards that reduce the hazard of raptor electrocution. Approximately 1.6 km (1 mi) of the line crosses old-field and woodland habitats of the Missouri River bluff; the remaining 10 km (6 mi) cross agricultural land. The Missouri River bluffs area that is traversed by the line is relatively developed and is traversed by U.S. Highway 75. The line does not cross the Missouri River, or any water body that might attract eagles or serve as travel corridors for the species. In addition, because of the level of disturbance and human activities, habitats along the line are not likely to be used by bald eagles. These conditions greatly reduce or eliminate the probability that bald eagles would accidentally strike the transmission line and be killed or injured.

The NRC assessed the impacts of transmission lines on avian populations in its Generic Environmental Impact Statement (GEIS) on the effects of nuclear power plant license renewal (NRC 1996). In the GEIS, the NRC concluded that mortality resulting from bird collisions with transmission lines associated with license renewal and an additional 20 years of operation would be of small significance. This conclusion was based on (1) the fact that existing literature does not indicate that collision mortality is high enough to result in population-level effects and (2) the lack of known instances where nuclear power plant lines affect large numbers of individuals in local areas. No new and significant information has been identified by the staff that would indicate that bald eagles have been adversely affected by Line 74S/74 and no bald eagle mortalities along Line 74S/74 have been reported by OPPD.

Based on this review, the staff concludes that the continued operation of FCS may affect, but is not likely to adversely affect the bald eagle.

C. Other Species

Because the western prairie fringed orchid, piping plover, and least tern are unlikely to occur in the vicinity of the FCS site or along Line 74S/74 corridor, the continued operation of FCS will have no effect on the western prairie fringed orchid, piping plover, and least tern.

VI. CONCLUSION

OPPD has no plans to conduct major refurbishment or construction activities at FCS for continued operations during the license renewal period; the proposed project is not a major construction activity. The proposed project is not located near designated critical habitat of any of the threatened and endangered species discussed in this assessment. Based on life-history information, habitats in the project area and along associated transmission Line 74S/74, operational characteristics of the plant, existing data for impingement and entrainment, and known thermal plume characteristics, the staff concludes that continued operation of FCS, Unit 1, during the proposed 20-year license renewal period may affect, but is not likely to adversely affect either the pallid sturgeon or bald eagle and will have no effect on the western prairie fringed orchid, piping plover, or the least tern.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
Nebraska Field Office
203 West Second Street
Grand Island, Nebraska 68801

January 13, 2003

Mr. Pao-Tsin Kuo
Program Director
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Mr. Kuo:

This responds to your December 9, 2002 (received December 16, 2002), letter requesting comments from the U.S. Fish and Wildlife Service (Service) on a Biological Assessment (Assessment) of the Potential Impacts to Threatened and Endangered Species Resulting from an Additional 20 Years of Operation of the Fort Calhoun Station (FCS), Unit 1, Nuclear Power Plant (TAC No. MB3402), located in Washington County, Nebraska. The Assessment determined that the proposed action is not likely to adversely affect the federally listed endangered pallid sturgeon or the threatened bald eagle. In addition, the Assessment stated that the proposed action would have no effect on the federally listed threatened western prairie fringed orchid and piping plover, or the endangered least tern. The December 9 letter requested concurrence from the Service.

After reviewing the Assessment, the Service has concluded that additional information is required before an evaluation can be completed to determine whether the Service will be able to concur with a not likely to adversely affect determination for the pallid sturgeon. The Service is concerned about the impact of heated water, which is released from the facility, on the pallid sturgeon. In the spring, increasing water temperatures are a spawning cue for the pallid sturgeon. Depending on the degree of increase in water temperature, and the distance downstream it can be detected, operation of the facility may or may not disrupt pallid sturgeon reproduction in the Missouri River. Therefore, the Service requests that the U.S. Nuclear Regulatory Commission (Commission) provide the following information:

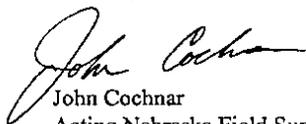
- 1) How warm is the released water after it is discharged from FCS?

- 2) How far downstream does the released water travel before being fully mixed with the Missouri River water during the May - July time period? Does this distance vary under high and low flow conditions, and if so what is the variation?
- 3) How much does the warm water plume warm the Missouri River in total after mixing? Does the amount of warming vary under high and low flow conditions?
- 4) During the pallid sturgeon spawning period (May - July), how far downstream (under high and low flow conditions) is a temperature change detectable? Is it detectable at the mouth of the Platte River?

Although no pallid sturgeon spawning has been documented in the Missouri River between FCS and Gavins Point Dam, there does appear to be potential spawning habitat between Gavins Point Dam and Ponca State Park. If spawning does occur in this river reach, pallid sturgeon larvae may drift as far downstream as FCS and be susceptible to impingment and entrainment. According to the Assessment, the larval monitoring studies at FCS ended in 1977. Since the current operating license for FCS does not expire until 2013, the Service requests that the larval monitoring studies be reinitiated to verify that pallid sturgeon larvae are not being adversely affected by FCS operations. The Service would be happy to work with the Commission to develop a larval monitoring study.

If you or members of your staff have any questions regarding this matter, please contact Mr. Wally Jobman within our office at (308)382-6468, extension 16.

Sincerely,



John Cochnar
Acting Nebraska Field Supervisor

(c)calhoun.ltr



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 30, 2003

Mr. John Cochnar
Acting Nebraska Field Supervisor
U.S. Fish and Wildlife Service
Ecological Services Office, Nebraska Field Office
203 West Second Street
Federal Building, 2nd Floor
Grand Island, Nebraska 68801

SUBJECT: RESPONSE TO THE U.S. FISH AND WILDLIFE SERVICE LETTER OF
JANUARY 13, 2003, REQUESTING ADDITIONAL INFORMATION, FOR THE
FORT CALHOUN STATION, UNIT 1, LICENSE RENEWAL (TAC NO. MB3402)

Dear Mr. Cochnar:

The U.S. Nuclear Regulatory Commission (NRC) staff has prepared the enclosed response to the U.S. Fish and Wildlife Service's (FWS) letter dated January 13, 2003. Your letter requested additional information after reviewing the NRC's December 2002, biological assessment (BA) for the Fort Calhoun Station (FCS), Unit 1.

The BA addressed the expected impacts resulting from an additional 20 years of FCS operation on five federally threatened or endangered species having the potential to occur in the general vicinity of the station. The NRC staff concluded that renewal of the FCS operating license may affect, but is not likely to adversely affect, the pallid sturgeon and bald eagle, and will have no effect on the remaining three species. The NRC forwarded the BA to FWS in a letter dated December 9, 2002, and requested FWS concurrence in the NRC Staff's conclusions relative to the five species discussed in the BA.

In your January 13, 2003, response you stated that additional information was required before the FWS could concur with the NRC's determination of "not likely to adversely affect" for the endangered pallid sturgeon, *Scaphirhynchus albus*. You asked four specific questions regarding the thermal regime in the Missouri River below the Station discharge. In addition, your letter stated that larval fish monitoring studies at the FCS should be reinitiated to verify that pallid sturgeon larvae are not being adversely affected by FCS operations. The attachment to this letter provides responses to your request for information.

After an extensive review, the NRC staff still considers the December 9, 2002, BA to be its assessment of record for the FCS, as supplemented by the information contained in the attachment to this letter. The NRC continues to conclude that the proposed action may affect but is not likely to adversely affect the pallid sturgeon. The NRC staff has determined, based on the known distribution of the pallid sturgeon in the Missouri River, the volume of water withdrawn by the station, the extent of the thermal plume, life history information on the pallid sturgeon and related species, and the questionable value of additional larval sturgeon collection studies in the channelized portion of the Missouri River that there is no need to conduct additional larval monitoring studies at this time. The NRC requests your concurrence in its December 9, 2002, BA as supplemented by the attachment to this letter.

J. Cochnar

2

The NRC would like to clarify its schedule for the review of Fort Calhoun Station's license renewal application. The NRC is considering an application for renewal of the operating license for the Fort Calhoun Station, Unit 1 for an additional 20 years beyond the original license expiration date of 2013 (i.e., to 2033). The NRC is scheduled to issue the Final Supplemental Environmental Impact Statement (SEIS) by August 15, 2003, and will make its license renewal decision by November 2003. The renewed license, if issued, will supercede the original license and will be valid from date of issuance in November of 2003 until August 9, 2033.

If you have any questions regarding this response to your request for additional information, please contact the environmental license renewal project manager, Jack Cushing, by telephone at (301) 415-1424 or by e-mail at jxc9@nrc.gov.

Sincerely,



Pao-Tsin Kuo, Program Director
License Renewal and Environmental Impacts
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket No.: 50-285

Enclosure: As stated

Appendix E

**Response to U.S. Fish and Wildlife Service's
January 13, 2003 Request for Additional Information
Fort Calhoun Station, Unit 1, Nuclear Power Plant**

Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

May 2003

Introduction

The U.S. Nuclear Regulatory Commission (NRC) is considering an application for renewal of the operating license for the Omaha Public Power District's (OPPD) Fort Calhoun Station, Unit 1 (FCS) for an additional 20 years beyond the expiration date of the current operating license (i.e., to 2033). The FCS is located on the west bank of the Missouri River at river kilometer RKm 1039 (River Mile [RM 646]) The renewed license, if approved, is scheduled to be issued by November 2003.

The NRC submitted a Biological Assessment (BA) to the U.S. Fish and Wildlife Service (FWS) on December 9, 2002 (NRC 2002). The NRC requested comments on the BA and concurrence on the conclusion that the proposed action (i.e., renewal of the operating license for FCS) may affect, but is not likely to adversely affect the pallid sturgeon and the bald eagle and will have no effect on the western fringed orchid, piping plover, or the least tern. One of the species that could potentially inhabit the Missouri River in the vicinity of the Station is the pallid sturgeon, *Scaphirhynchus albus*.

After reviewing the BA, the FWS indicated in its letter of January 13, 2003, that additional information would be required by the FWS related to the pallid sturgeon prior to taking any action on the NRC's request for concurrence (FWS 2003). The FWS requested additional information on FCS's thermal discharge plume as well as requesting re-initiation of larval fish monitoring studies in the vicinity of FCS to verify that pallid sturgeon larvae are not being adversely affected by station operations. This attachment responds to the FWS request for additional information.

Thermal Discharge

A cooperative effort was conducted among OPPD, the U.S. Environmental Protection Agency (EPA), and the Nebraska Department of Environmental Quality (NDEQ) to evaluate the characteristics of the thermal discharge from FCS using computer modeling (CORMIX) and field verification (OPPD 2003). The purpose of this effort was to map heat in the Missouri River and to predict compliance with the Nebraska State Water Quality Standards under various river conditions for the purpose of establishing the appropriate national pollution discharge elimination system (NPDES) permit limits. The results from the recent CORMIX study have been used, in addition to past studies at FCS, as the basis for the NRC's response.

By a letter dated April 10, 2003, the EPA provided the final CORMIX data to the NRC (EPA 2003). The NRC can provide a copy of the data upon request. The study examined thermal plume characteristics from FCS discharges, specifically, under the 7-day 10-year low flow (7Q10) in the Missouri River. This study was performed using the EPA-approved CORMIX computer model and included intensive in river temperature monitoring. The results (EPA 2003) indicate that even under extreme low summer flow conditions and at 100 percent station power and maximum heat rejection rates, changes in the Missouri River temperature 1524 m (5000 ft) downstream of the FCS discharge will not exceed the National Pollutant Discharge Elimination System (NPDES) maximum temperature limit of 32°C (90°F) or the maximum change (ΔT) in river temperature of 2.8°C (5°F). In addition, telephone conversations with the EPA staff involved in the study have confirmed that discharges from FCS would experience overwhelming mixing and be indistinguishable from ambient river water well before the confluence of the Platte and Missouri Rivers (Dunn 2003).

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The studies have demonstrated that the impact of thermal discharges from FCS on temperature regime in the Missouri River is minor. In addition, the thermal discharge from FCS would be undetectable just a few miles downstream of the station and would have no impact by the confluence of the Platte and Missouri Rivers, approximately 80.5 river km (50 river miles) downstream. The specific questions asked in your January 13, 2003, letter are addressed below.

1. How warm is the released water after it is discharged from FCS?

As discussed in the NRC's BA (NRC 2002), the maximum cooling water intake and discharge flow during FCS's normal operations occurs in summer, and amounts to approximately 23 cubic meters per second (m^3/s) (827 cubic feet per second [cfs]), or about 2 percent of the average summer river flow. At the plant's currently authorized maximum power level of 1500 megawatts-thermal (MWt), in effect since 1980, this cooling water is usually discharged at a nominal temperature of approximately $12.8^\circ C$ ($23^\circ F$) higher than the ambient river temperature in the summer. In the winter, this temperature differential is approximately $17.2-17.8^\circ C$ ($31 - 32^\circ F$) when a portion of the heated discharge is recirculated back to the intake structure to prevent icing (OPPD 2002). In the spring and fall when river temperatures are cool, the cooling water discharge may range approximately $.6-1.7^\circ C$ ($1 - 3^\circ F$) higher than the summer nominal temperature differential of $12.8^\circ C$ ($23^\circ F$), and in winter the temperature differential can range several degrees higher than $17.2-17.8^\circ C$ ($31 - 32^\circ F$), reflecting the use of fewer cooling water pumps and higher efficiencies of plant heat exchangers and condensers during those times.

Several modeling and monitoring studies were conducted by the OPPD, in cooperation with others, from 1973 through 1977 to determine the characteristics of the thermal discharge from FCS (OPPD 1978). These studies were conducted prior to 1980 when the maximum authorized power level and discharge temperature of FCS was lower than present (i.e., 1420 MWt). Results from the 1973 to 1977 studies demonstrated that the Atomic Energy Commission's initial projections for the FCS thermal plume dimensions bounded conditions projected for the current FCS power level (OPPD 2002).

The maximum temperature of the FCS discharge authorized under the current NPDES permit for the plant is $43.3^\circ C$ ($110^\circ F$). However, a temporary authorization of $44.4^\circ C$ ($112^\circ F$) is allowed in view of unusually high ambient river temperatures that have occurred in recent years. Based on the results of the CORMIX study the EPA has suggested that the NPDES permit limits for FCS allow the current peak discharges as the permit limit (EPA 2003).

2. How far downstream does the released water travel before being fully mixed with the Missouri River in the May-July time period? Does this distance vary under high and low flow conditions?

The downstream distance that FCS cooling water travels before being fully mixed has not been directly assessed in the current CORMIX studies, which have focused on conformance to provisions of Nebraska Title 117 Chapter 1, Section 041, for mixing zones: i.e., that limited area or volume of a water body designated by NDEQ that is allowed for mixing of the discharge, upon meeting initial discharge limits. The CORMIX thermal plume modeling results using near worst case summer low flow conditions indicate that the plume temperature would fall to

approximately 1.5 °C (2.7 °F) above river ambient temperature at a point 1524 m (5000 feet) downstream, the distance assumed at the end of the mixing zone (OPPD 2003). This modeling run assumed only circulating water flow from the plant of 22.7 m³/s (802 cfs) which is slightly lower than total discharge of 23 m³/s (827 cfs), a discharge temperature of 13.1 °C (23.6 °F) above river ambient temperature, which approximates full power conditions and worst case summer river conditions, including a summer 7-day, 10-year low flow (7Q10) of 818 m³/s (28,892 cfs) and an ambient river temperature of 30.6 °C (87° F). Historical thermal plume studies indicate that low river flows result in poorer mixing conditions than high river flow conditions, so predicted plume temperature at a point 1524 m (5000 feet) downstream would be lower at higher river flows (OPPD 1978, Section III, page 8).

Historical triple-depth field monitoring of the plume in August 1975 provides an example of how rapidly temperatures dissipate in the near field part of the plume during typical summer conditions. At the time those measurements were made, the plant was operating at 96 percent power level, initial discharge temperature was 9.2 °C (16.6 °F) above river ambient temperature, and river flow was 991 m³/s (35,000 cfs). Results indicated that maximum plume temperatures were .95 °C (1.7 °F) and .78 °C (1.4 °F) above ambient temperature within 487.6 meters (1600 feet) and 1768.8 meters (5800 feet) of the discharge point, respectively (OPPD 1978, Section III, Table 18).

3. How much does the water plume warm the Missouri River in total after mixing? Does the amount of warming vary under high and low flow conditions?

Simple dilution calculations can be used to provide theoretical estimates of river temperature increases after total mixing. Assuming a cooling water discharge flow of 23 m³/s (827 cfs) at an assumed temperature increase of 13.1 °C (23.6 °F), which approximates maximum plant power level in summer, the average river temperature would be increased by approximately .4 °C (0.7 °F) under summer low flow conditions (7Q10) of 818 m³/s (28,892 cfs), and by approximately .1 °C (0.2 °F) under a summer maximum monthly average flow (July) of 2,224 m³/s (78,560 cfs). However, as may be inferred from the response to Question 2 above, full mixing likely occurs within a few miles below the outfall, and heat dissipation factors other than dilution (e.g., heat loss to the atmosphere) are important in reducing plume temperature.

4. During the pallid sturgeon spawning period (May – July), how far downstream (under high and low flow conditions) is a temperature change detectable? Is it detectable at the mouth of the Platte River?

As noted above, the results of the CORMIX study have focused on near-field plume temperatures (e.g., at 1524 meters [5000 feet] downstream). However, it is expected that plume excess temperatures would be virtually indistinguishable within a few miles downstream from the outfall. For example, results of triple-depth field monitoring of the thermal plume under conditions cited above in the response to Question 2 indicate that plume excess temperatures were mostly at or below .6 °C (1 °F) within approximately 6.4 kilometers (4 miles) below the outfall (OPPD 1978, Section III, Table 18). Diurnal variations in the ambient river may be as high as 1.7 °C (3 °F), based on FCS operations logs. The mouth of the Platte River is approximately 80.5 river kilometers (Rkm) (50 river miles [RM]) downstream from FCS. The FCS thermal plume is undetectable many miles upstream from the mouth of the Platte River. Therefore the staff concludes that since the thermal plume is undetectable many miles upstream of the Platte River the thermal plume from FCS would not result in inappropriate spawning cues to the pallid sturgeon.

Larval Fish Monitoring Studies

The FWS notes that, although no pallid sturgeon spawning has been documented in the Missouri River between FCS Rkm 1039 (RM 646) and Gavins Point Dam at Rkm 1305 (RM 811), there appears to be potential spawning habitat between Gavins Point Dam and Ponca State Park Rkm 1213 (RM 753.5) (FWS 2003). The FWS further indicates that, if spawning does occur in that reach of the river, then pallid sturgeon larvae may drift as far downstream as FCS and be susceptible to entrainment. Noting that the NRC's assessment indicates that larval monitoring at FCS ended in 1977 and that the current operating license for FCS does not expire until 2013, FWS requested that the FCS larval monitoring studies be reinitiated "to verify that pallid sturgeon larvae are not being adversely affected by FCS operations" (FWS 2003).

The NRC does not believe that reinstatement of larval monitoring studies at FCS is warranted for several reasons, most of which were discussed in the NRC's Biological Assessment (NRC 2002). The following discussion highlights these reasons and provides relevant supporting information.

1. Rarity of Pallid Sturgeon near FCS

The relative rarity of pallid sturgeons in the vicinity of FCS and upstream to Gavins Point Dam is indicated by historical collections. No pallid sturgeons were reported to be collected in the extensive monitoring studies conducted by OPPD and others in the FCS vicinity in the 1970s (OPPD 1978, Hesse, Bliss, and Zuerlein 1982). Kallemeyn and Novotney (1977) collected 248 sturgeons as a result of extensive collections in 1976 at one station in the unchannelized reach below Fort Randall Dam Rk 1416 (RM 880), two stations in the unchannelized reach below Gavins Point Dam, and one station in the channelized reach below Sioux City, Iowa. Only one pallid sturgeon was found in these collections, in the reach below Fort Randall Dam. All of the remainder were shovelnose sturgeons and, of these, 227 were collected in the unchannelized reach below Gavins Point. No sturgeons were collected in the channelized reach below Sioux City. This finding is consistent with the low catches of shovelnose sturgeons in the OPPD studies for FCS (OPPD 1978).

In the lower Missouri river, within which FCS is situated, more recent documented occurrences of pallid sturgeon are rare. According to the Nebraska Natural Heritage Program (NGPC 2001), between Gavins Point Dam, including its tailwaters, and Nemaha County, approximately at Rkm 887 (RM 525), 32 occurrences of pallid sturgeon were documented from January 1980 through June of 2001. FCS is located at Rkm 1039 (RM 646). The number of pallid sturgeon occurring upstream of FCS, according to this data source (NGPC 2001), is 15 out of the 32 occurrences with 17 out of the 32 occurrences downstream of FCS and approximately 7 out of the 32 occurrences documented at the Plattsburgh Bend. This data source (NGPC 2001) also documents an additional 8 pallid sturgeons near the confluence of the Platte and Missouri Rivers, but in the Platte River, during this same time period (i.e., from Rkm 0.0 to Rkm 53 [RM 0.0 to RM 33] within the Platte river). In a separate study funded by the U.S. Army Corps of Engineers (USACE) and carried out by the Nebraska Game and Parks Commission (Mestl 2003), 13 pallid sturgeons were documented in this same reach of the lower Missouri River (i.e., between Rkm 1305 and Rkm 887 [RM 811 and RM 525]) during 2001-2002. The majority of these (i.e., 10 out of the 13 pallid sturgeons) were located near the Plattsburgh Bend (approximately Rkm 954-956 [RM 593-594]).

In summary the studies done by OPPD in the early 1970's documented no occurrences of pallid sturgeons in the reach of the river near FCS and the Natural Heritage Program has documented only 15 occurrences of pallid sturgeons upstream of FCS to Gavins Point Dam, in the years ranging from January 1980 through June 2001 (NGPC 2001), while NGPC documented none upstream of FCS in their independent study carried out in 2001 and 2002 (Mestl 2003).

2. Low Probability of Spawning Upstream of FCS

The rarity of juvenile and adult pallid sturgeon in the Missouri River from Gavins Point to St. Louis is indicated by recent collections that have included the lower Missouri River, in which the species has comprised only 0.2 to 0.4 percent of total river sturgeons collected (FWS 2000, page 104). Both the rarity of the species in the river and in the FCS site vicinity and upstream to Gavins Point indicates that there is a low potential production of larvae upstream from FCS. As noted above, there have been relatively more observations of this species on the Missouri River near the mouth of the Platte River, approximately 80.5 river kilometers (50 river miles) downstream from FCS.

The low potential for significant numbers of pallid sturgeon larvae to occur in the drift at FCS is supported by the low incidence of *Scaphirhynchus* sp. larvae found in intensive Missouri River fish larvae collections by OPPD and others in the vicinity of FCS in the 1970s. A review of available summary reports for that period indicate that the number of *Scaphirhynchus* sp. larvae collected in these efforts included none in 1974 and 1975, 1 in 1976, and one to a few in 1977 (OPPD 1978; OPPD 1977). Harrow and Schlesinger (1980) collected only 23 *Scaphirhynchus* sp. larvae (of a total 44,110 total larvae) in intensive vertical composite plankton net sampling at seven cross-channel transects on the Missouri River between Gavins Point Dam and Leavenworth, Kansas. Fewer than 10 of these larvae were collected at the transect located at FCS. It is highly likely that all of these larvae were shovelnose sturgeon, which were and remain much more common than the pallid sturgeon in the Missouri River, as discussed above.

During the 1970s, documented occurrences of adult pallid sturgeons in the Missouri River per year were reduced by approximately 58% as compared to a more drastic reduction in the 1980s of 86% (55 FR 26641 [FWS 1990]). Despite the relative greater abundance of pallid sturgeons during the OPPD study period, and the subsequent higher potential for spawning to successfully occur, only a few *Scaphirhynchus* sp. larvae were found. It was not possible to identify the collected larvae below the genus *Scaphirhynchus*. Additionally, despite recent pallid sturgeon recovery efforts, evidence of successful reproduction and recruitment throughout its range remain rare. Only three pallid sturgeon larvae have been found in the lower Missouri River. Their relative number to other species of collected larvae suggest that spawning success and larval abundance for the pallid sturgeon remain low (FWS 2000). Given that pallid sturgeon occurrences upstream remain rare, despite recent habitat restoration and population augmentation efforts, and that evidence of successful spawning and larval abundance also remains very low, the NRC staff concludes that a far field larval monitoring program around FCS would not generate any useful data.

The upstream Gavins Point–Ponca reach of the Missouri River may have some potential to support spawning of the pallid sturgeon, because this unchannelized reach exhibits more natural habitat characteristics than does the river downstream, which is channelized (as at FCS). However, spawning substrate is reportedly quite limited, based on observations of Hesse and Mestl (1993) with respect to the paddlefish (*Polyodon spathula*), which spawns

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demersal adhesive eggs on coarse substrates in swift current, as is presumed to be the case for the pallid sturgeon (Smith 1979, FWS 2000). In addition, as indicated by FWS in their January 13, 2003 letter (FWS 2003), no pallid sturgeon spawning has been documented in the Missouri River between FCS and Gavins Point Dam, and the specific suitability of the Gavins Point-Ponca reach for pallid sturgeon spawning has not been demonstrated.

Further, it is recognized that the hydrologic regime established under the current water control plan (CWCP) of the USACE, particularly suppression of spring flows, has likely resulted in the loss of spawning cues (i.e., warm water coupled with river stage increases) for the pallid sturgeon (FWS 2000), which would act to reduce or eliminate spawning success even if otherwise suitable spawning habitat is present. The proposed increase of river flows during spring, to produce an artificial spring rise and the potential restoration of a spawning cue for the pallid sturgeon, is one of the most contentious issues surrounding the revision of the Missouri River Master Manual. This involves a recommended additional spring flows of 425 to 566 m³/s (15,000 to 20,000 cfs) through Gavins Point Dam during the month of May. It is unclear at this time whether such a plan will be implemented (MDNR 2003). While the critical importance of this habitat component is recognized, the magnitude, frequency, and duration of these spawning cues for the pallid sturgeon currently remain unknown, and the USACE has indicated the need for additional research, monitoring, and evaluation to determine appropriate temperature and hydrologic parameters (USACE 2003).

In summary the staff concludes that despite an intensive monitoring program in the 1970s, when the adult population was significantly more abundant, the number of *Scapirhynchus* sp. larvae caught were not sufficient to make any meaningful, and statistically valid, conclusions about the impact of the facility on the pallid sturgeon. Additional site-specific studies at this time would likely yield even less useful data.

3. Additional larval monitoring studies at FCS are unnecessary.

The NRC believes that further monitoring studies at FCS would not be useful in demonstrating whether FCS has any adverse effect on the pallid sturgeon. Monitoring studies of fish impingement and entrainment at FCS and fish populations in the Missouri River, tributary streams, and backwater habitats on and near the FCS site in the 1970s did not specifically document the presence of pallid sturgeon, and no detectable effect on Missouri River fish populations from FCS operation was discerned on the basis of these intensive studies. As noted in the Pallid Sturgeon Recovery Plan (FWS 1993) and broadly stated elsewhere, destruction and alteration of habitats by human modification of the river system are the primary cause of declines in reproduction, growth, and survival of a pallid sturgeon, and it is unlikely that the species can be recovered without restoring these habitat elements, which include morphology, hydrology, temperature regime, cover, and sediment/organic matter transport.

The NRC staff has determined, based on the known distribution of the pallid sturgeon in the Missouri River, the volume of water withdrawn by the station, the extent of the thermal plume, life history information on the pallid sturgeon and related species, and the questionable value of additional larval sturgeon collection studies in the channelized portion of the Missouri River there is no need to conduct additional larval monitoring studies at this time. While the NRC recognizes the critical importance of protecting the pallid sturgeon from possible extinction, the NRC concludes that implementing such a monitoring study is not needed nor helpful in achieving this goal and is also not needed to assess the impact of FCS's continued operations on the pallid sturgeon and protecting this endangered species. Previous OPPD studies remain relevant and supportive of NRC's conclusion that continued operations of FCS may affect, but is not likely to adversely affect the pallid sturgeon.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
Nebraska Field Office
203 West Second Street
Grand Island, Nebraska 68801

July 2, 2003

Mr. Pao-Tsin Kuo
Program Director
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Mr. Kuo:

This responds to your May 30, 2003 (received June 5, 2003), letter requesting comments from the U.S. Fish and Wildlife Service (Service) on a Biological Assessment (BA) of the Potential Impacts to Threatened and Endangered Species Resulting from an Additional 20 Years of Operation of the Fort Calhoun Station (FCS), Unit 1, Nuclear Power Plant (TAC No. MB3402), located in Washington County, Nebraska. The U.S. Nuclear Regulatory Commission (NRC) submitted the BA to the Service in a letter dated December 9, 2002. The BA determined that the proposed action is not likely to adversely affect the federally listed endangered pallid sturgeon (*Scaphirhynchus albus*) or the threatened bald eagle (*Haliaeetus leucocephalus*). In addition, the BA stated that the proposed action would have no effect on the federally listed threatened western prairie fringed orchid (*Platanthera praeclara*) and piping plover (*Charadrius melodus*), or the endangered least tern (*Sterna antillarum*). After reviewing the BA, the Service concluded that additional information was required before an evaluation could be completed to determine whether the Service could concur with NRC's not likely to adversely affect determination for the pallid sturgeon. The Service requested the additional information in a letter to NRC dated January 13, 2003. NRC provided the additional information in the May 30, 2003, letter.

After reviewing the BA, and the additional information, the Service is concerned that if pallid sturgeon spawning does occur in the Missouri River between Gavins Point Dam and FCS, the larvae produced would be susceptible to entrainment or impingement at FCS. Under Section 9(a)(1) of the Endangered Species Act (ESA) of 1973, as amended, it is unlawful to "take" endangered species of fish and wildlife. As defined in the ESA, "The term 'take' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Therefore, because pallid sturgeon larvae may potentially be taken under the proposed action, the Service has concluded that it is not able to concur with NRC's not likely to adversely affect determination for the pallid sturgeon.

Since the Service is unable to concur with NRC's determination of not likely to adversely affect, we request that NRC undertake one of the following conservation measures, as part of the proposed federal action, to minimize or compensate for, project effects on the pallid sturgeon:

Measure 1: Conduct a 3-year larval monitoring study at FCS to determine the impacts of the facility on pallid sturgeon larvae. Larval monitoring studies conducted by the Omaha Public Power District (OPPD) at FCS during the 1970s found that *Scaphirhynchus sp.* larvae were being impacted by the facility. However, at that time, it was not possible to differentiate between shovelnose (*Scaphirhynchus platyrhynchus*) and pallid sturgeon larvae. Consequently, OPPD determined that it was highly likely that all of the collected larvae were shovelnose sturgeon, the more abundant species. Since the 1970s, advanced study techniques have evolved and researchers have developed techniques to distinguish between larvae of the two species. Therefore, the Service believes that a larval monitoring study would be instrumental in determining if the facility is taking pallid sturgeon larvae. The design of a larval monitoring study should be coordinated with the Service and Nebraska Game and Parks Commission (NGPC).

If NRC chooses this measure, the relicensing process could continue. If the larval monitoring study documents that pallid sturgeon larvae are being taken at FCS, the consultation process, under Section 7 of the ESA, would need to be reinitiated. During the consultation process, methods to minimize (e.g., structural modifications) the take of pallid sturgeon larvae at FCS would be pursued.

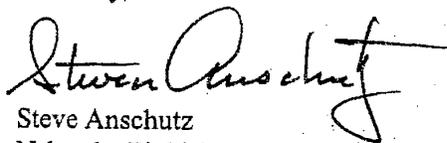
Measure 2: Forgo the larval monitoring study described under Measure 1, and pursue structural modifications at FCS, using the best available technology, which would either minimize or avoid the take of pallid sturgeon larvae. If NRC chooses this measure, and commits to making the structural modifications, the relicensing process could continue and the Section 7 consultation process would be completed.

If NRC chooses not to commit to either Measure 1 or 2, NRC should request initiation of formal Section 7 consultation with the Service. Under the ESA, the Service has 90 days following initiation of formal consultation during which to develop a draft biological opinion (BO), and an additional 45 days to issue a final BO. The BO would contain an incidental take statement, with reasonable and prudent measures, which the Service believes are necessary or appropriate to minimize the impacts (i.e., amount or extent) of incidental take.

In addition to the federally and state listed endangered pallid sturgeon, the sturgeon chub (*Macrhybopsis gelida*) and lake sturgeon (*Acipenser fulvescens*) are listed as endangered and threatened species, respectively, under the Nebraska Nongame and Endangered Species Conservation Act, and may be impacted by FCS. Therefore, the Service recommends that NRC consult with the NGPC regarding the possible impacts of FCS operations on state listed species. The appropriate contact person with the NGPC would be Mr. Frank Albrecht at (402)471-5422.

If you desire, the Service would be willing to participate in a conference call or attend an informal meeting (preferably at FCS) to discuss the aforementioned measures. If you or members of your staff have any questions regarding this matter, please contact Mr. Wally Jobman within our office at (308)382-6468, extension 16.

Sincerely,



Steve Anschutz
Nebraska Field Supervisor

cc: AES, R-6, MS 60120 (Attn: Bob McCue)
FWS; Bismarck, ND (Attn: Steve Krentz)
EPA; Kansas City, KS (Attn: John Dunn)
EPA; Kansas City, KS (Attn: Joe Coethern)
NGPC; Lincoln, NE (Attn: Frank Albrecht)
NDEQ; Lincoln, NE (Attn: Mike Linder)

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