



LOUP POWER DISTRICT

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January 27, 2017

Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

Subject: Loup River Hydroelectric Project
Comments on USFWS' Final Biological Opinion
FERC Project No. 1256-031

Dear Secretary Bose:

Loup River Public Power District (Loup Power District or District) has reviewed the December 16, 2016, Final Biological Opinion prepared by the U.S. Fish and Wildlife Service (USFWS) regarding the relicensing of the District's Loup River Hydroelectric Project, FERC Project No. 1256 (Project) and provides the following comments for the Commission to forward to USFWS.

As documented in our June 1, 2015, letter, the District identified numerous fatal flaws in the analysis and conclusions of the Draft Biological Opinion. The District identified that the Draft Biological Opinion was inconsistent with the requirements of the Endangered Species Act (ESA), the ESA regulations, and the guidelines of USFWS. Upon review of the Final Biological Opinion, the fatal flaws contained within the Draft Biological Opinion have not been addressed. Therefore, consistent with the comments the District provided on the Draft Biological Opinion, the Final Biological Opinion cannot be the basis for reasoned decision making by the Commission in this relicensing proceeding.

Consistent with our June 1, 2015, letter, the District believes that the Final Biological Opinion does not comply with applicable ESA standards, is not well-reasoned, and regularly reaches conclusions that are not supported by evidence in the record of this relicensing proceeding. Each of these flaws were discussed in detail in the District's June 1, 2015, comments; however, because the Final Biological Opinion contains these same flaws, the District restates them and provides a few additional details below.

- The Final Biological Opinion's definition of "environmental baseline" is inconsistent with ESA Section 7 regulations, the Endangered Species Consultation Handbook, and applicable case law. Furthermore, the definition of "environmental baseline" is internally inconsistent within the Biological Opinion.

- Rather than treating the “environmental baseline” as “*the total effects of all past activities, including effects of the past operation of the project,*” which would include water diversions that have occurred thus far, the Final Biological Opinion treats a “no diversion” condition as the “environmental baseline.” Because of this misapplication of a concept that is critical to consultation, the Final Biological Opinion creates a fictional “environmental baseline” that consists of a condition (no diversion) that does not exist and has not existed for nearly eight decades. This is accompanied by the status of endangered and threatened species that might have occurred in this fictional condition. As a result, the effects of the proposed license consist of the effects of water diversions when compared to a “no diversion” condition rather than the effects of *future* water diversion on a river and listed species that have been exposed to Project-related water diversion for nearly eight decades.
- The Final Biological Opinion’s major conclusions do not reflect reasoned decision making based on the evidence the Final Biological Opinion presents.
- Many of the Final Biological Opinion’s conclusions are assumptions, and many other assumptions are presented as facts without record support; the Final Biological Opinion does not consider alternative assumptions that would be equally valid, nor does the Final Biological Opinion provide reasoned analysis to support its assumptions.
- The Final Biological Opinion fails to use the best scientific and commercial data available and fails to comply with other information standards that are applicable.
 - The Final Biological Opinion still fails to recognize the results of the studies performed by the District as agreed upon per the Study Plan Determination. The District comments on the Draft Biological Opinion provided numerous examples of the relevance of site-specific studies performed by the District (see Attachment C of the District’s June 1, 2015, letter) that were not acknowledged or considered in the Final Biological Opinion.
 - The Final Biological Opinion incorrectly dismisses the results of years of study by the Platte River Recovery Implementation Program (PRRIP) that prove the underlying hypothesis of the Flow-Sediment-Mechanical strategy to be in error. This is despite the fact that the PRRIP studies considered the use of this strategy on other rivers, including the Loup and lower Platte rivers, and still found the strategy to be ineffective at producing or maintaining suitable habitat for interior least terns and piping plovers.
 - Furthermore, the Final Biological Opinion still fails to acknowledge the research of the PRRIP and others that has determined that the majority of successful interior least tern and piping plover nesting occurs on off-channel habitat.
- The Final Biological Opinion uses a different assessment framework for fish species compared to the assessment framework for bird species, which is arbitrary and capricious.
- The Final Biological Opinion’s Incidental Take Statement does not comply with Congressional intent, USFWS regulations and policies, and case law.
 - Pallid sturgeon Terms and Conditions 1(a) of RPM1 should be deleted.

- This RPM ignores the USFWS' previous agreement that it is not possible to discern Project effects on water temperature in the lower Platte River due to the numerous tributaries entering the river downstream of the Project Tailrace, the distance from Project to the USGS gage at Louisville, and the overriding influence that solar radiation and atmospheric conditions have on water temperature. USFWS agreed to these principles during development of the District's Study Plan.¹ As documented in Attachment A, a study of Water Temperature in the Platte River was considered during development of the District's Study Plan. This study was eliminated after discussion with USFWS, Commission Staff, and other resource agencies because all parties agreed that it was not possible to discern Project effects on water temperature in the lower Platte River. Since all parties agreed that it was not possible to discern Project effects on water temperature in the lower Platte River, it is disingenuous, as well as arbitrary and capricious, to include a requirement related to water temperature in the lower Platte River as part of any potential license article.
- The Final Biological Opinion does not establish temperature as a reasonable surrogate for estimating the number of pallid sturgeon that would be "killed" by Project effects, nor does it establish that Project effects are responsible for elevated temperatures in the Platte River (and certainly not at Louisville, more than 80 miles downstream of the Project Tailrace Weir).
- The Final Biological Opinion fails to consider the results of the District's study of Water temperature in the Loup River Bypass Reach² that identified a statistically significant one-to-one relationship between temperature upstream of the Project Diversion Weir and temperature downstream of the Diversion Weir—thus the cessation of diversion of water into the Loup Power Canal would have no effect on water temperature downstream of the Project. For example, if water downstream of the Diversion Weir is 93 degrees, releasing additional water from upstream of the Diversion Weir would not reduce the downstream water temperature because the upstream water has been statistically proven to also be 93 degrees. In addition, the Project has no instream dam that can store and/or release cooler water.

¹ See the District's July 27, 2009, Revised Study Plan, Appendix A, Study 3.0, Water Temperature in the Platte River.

² See the District's April 13, 2012, Final License Application, Volume 3, Final Study Report, Appendix C.

- Pallid sturgeon RPM 1 should be deleted.
 - This RPM and its terms and conditions are intended to minimize the potential for pallid sturgeon mortalities due to Project diversions and hydrocycling operations – it does not accomplish this. Instead it requires the District to fund and conduct a 30-year monitoring study of river flows and stages that replicates studies the District conducted as part of the relicensing process. These studies could not establish that Project effects cause mortalities of pallid sturgeon due to dewatering or hydrocycling and supposedly results in the “take” pallid sturgeon; requiring the District to repeat those studies will not serve the RPM’s purposes and will not minimize the impacts on pallid sturgeon. This RPM and its associated Terms and Conditions are unwarranted and inappropriate, and should be deleted.
- Interior least tern RPM 1 should be deleted
 - Given that the Draft Opinion does not explain why USFWS concluded that the Project is likely to cause the inundation that results in the loss of Interior least tern nests, this RPM and its associated Terms and Conditions are unwarranted and inappropriate, and should be deleted.
 - In addition, this RPM and its terms and conditions do not minimize the impact of potential nest loss on Interior least terns. Instead it requires the District to fund and conduct a 30-year monitoring study of river flows and stages that replicates studies the District conducted as part of the relicensing process. These studies could not establish that Project effects cause the inundation that supposedly results in the “take” of least tern nests; requiring the District to repeat those studies will not serve the RPM’s purposes and will not minimize the impacts of inundation on least terns. This RPM and its associated Terms and Conditions are unwarranted and inappropriate, and should be deleted.
- Piping plover RPM 1 should be deleted
 - Given that the Draft Opinion does not explain why USFWS concluded that the Project is likely to cause the inundation that results in the “take” of piping plover, this RPM and its associated Terms and Conditions are unwarranted and inappropriate, and should be deleted.
 - In addition, this RPM and its terms and conditions do not minimize the impact of potential nest loss on Interior least terns. Instead it requires the District to fund and conduct a 30-year monitoring study of river flows and stages that replicates studies the District conducted as part of the relicensing process. These studies could not establish that Project effects cause the inundation that supposedly results in the alleged “take” of piping plover; requiring the District to repeat them will not serve the RPM’s purposes and will not minimize the impacts of inundation on least terns. This RPM and its associated Terms and Conditions are unwarranted and inappropriate, and should be deleted.
- The Final Biological Opinion still does not demonstrate by substantial record evidence that losses of interior least tern or piping plover nests over the next 30 years are the direct result of Project operations rather than other causes.

- The Final Biological Opinion still does not present any evidence that suggests putative Project “effects” had any statistical or practical significance, were caused by the Project (rather than being mathematical artifacts “caused” by small sample sizes, random chance, sampling error, process error, and other phenomena), or were not caused by phenomena such as weather that are unrelated to Project effects.
- Further, the Final Biological Opinion still ignores the extensive case law on incidental take statements that has established clear requirements for incidental take statements. In particular, courts have required USFWS to causally connect an effect to the action and disconnect it from other potential causal agents before treating that effect as “take” (for example, see *Arizona Cattle Growers Association v USFWS*, 273 F.3d 1229 (9th Circuit 2001)). USFWS codified this requirement in final regulations published on May 11, 2015 (80 CFR 26845). The Final Biological Opinion ignores these requirements.

The District also provided 61 specific comments on USFWS’ May 1, 2015, Draft Biological Opinion; of those, only 7 have been addressed (see Attachment B). Although there were numerous minor text revisions throughout the December 16, 2016, Biological Opinion and some mathematical errors were addressed, the District’s substantive comments were not addressed.

Finally, Appendix F of the Final Biological Opinion presents “supplemental scientific and commercial information” that is described as having been considered in the Final Biological Opinion. Because this information was not included in the Draft Biological Opinion, and because the Final Biological Opinion relies on this new information, the District provides comments on the information in Appendix F, presented in Attachment C. None of the new information provided in Appendix F provides justification for the conclusions in the Final Biological Opinion, nor does it support the Incidental Take Statement.

As documented above and in provided Attachments, the Final Biological Opinion is unsupported by record evidence, is fatally flawed, and is inconsistent with the requirements of the ESA, the ESA regulations, and the guidelines of USFWS. Furthermore, as the District has repeatedly shown, the flow modifications assumed in the Final Biological Opinion based on Draft License Articles 404 and 406 do not provide benefits to the species, are unsupported by record evidence, and are arbitrary and capricious. Therefore, the Final Biological Opinion cannot be the basis for reasoned decision making by the Commission in this relicensing proceeding, and the Commission’s reliance on that Final Biological Opinion and incorporation of its provisions in the final license for this Project would be arbitrary and capricious.

On no less than 10 occasions in the past three years, the District has requested a technical conference with USFWS and Commission staff to discuss the above issues. The District reiterates its request for a technical conference to develop workable conditions that address compliance needs as well as operational limitations. If you have any questions regarding the District's comments or any information provided by the District, please contact me at (402) 564-3171 ext. 268.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Neal D. Sues", is positioned to the left of a vertical line that extends downwards.

Neal D. Sues
President/CEO
Loup Power District

cc: Cheryl LaFleur, FERC Commissioner
Colette Honorable, FERC Commissioner
U.S. Secretary of the Interior
Director, U.S. Fish and Wildlife Service
Noreen Walsh, USFWS, Regional Director
Matt Hogan, USFWS, Deputy Regional Director
Mike Thabault, USFWS, Assistant Regional Director - Ecological Services
Eliza Hines, USFWS, Nebraska Field Supervisor
U.S. Secretary of Energy
U.S. Senator Fischer
U.S. Senator Sasse
U.S. Representative Fortenberry, Nebraska 1st District
U.S. Representative Bacon, Nebraska 2nd District
U.S. Representative Smith, Nebraska 3rd District
Nebraska Governor Pete Ricketts
Jim Douglas, Nebraska Game and Parks Commission, Director
Nebraska Game and Parks Commissioners

Enclosure

Attachment A of
January 27, 2017 District Letter to FERC
RE: Comments on Final Biological Opinion

Docket P-1256-31

ATTACHMENT A

**ELIMINATION OF STUDY 3.0, WATER TEMPERATURE IN THE PLATTE RIVER
AS DOCUMENTED IN THE DISTRICT'S JULY 27, 2009 REVISED STUDY PLAN**

STUDY 3.0 WATER TEMPERATURE IN THE PLATTE RIVER

At the April 21, 2009, Study Plan Meeting, the goals and objectives of Study 3.0, Water Temperature in the Platte River, were discussed with the attending agencies, which included FERC, Nebraska Game and Parks Commission, U.S. Fish and Wildlife Service, Nebraska Department of Environmental Quality, Tern and Plover Conservation Partnership, Lower Loup Natural Resources District, National Park Service, Ponca Tribe of Nebraska, and City of Columbus, as well as others. The consensus of all agencies at the meeting was that this study (as defined in the District's Proposed Study Plan) could not be successful in isolating Project effects and is not necessary to facilitate Project relicensing. Therefore, the District is eliminating the study of water temperature in the Platte River.

The study was originally introduced in the District's Proposed Study Plan to address agency concerns with Project effects on pallid sturgeon related to water temperature. The accepted reach of the pallid sturgeon is defined as the Platte River below the confluence with the Elkhorn River. The primary concern was related to how changes in water temperature might affect the spawning and migration cues of the species.

The discussion at the April 21, 2009, Study Plan Meeting focused on the following variables that would be too great to overcome in attempts to isolate Project effects on water temperature in the lower Platte River:

- Tributaries

Multiple tributaries contribute flow to the Platte River between the Tailrace Canal and U.S. Geological Survey (USGS) Gage 06805500, Platte River at Louisville, NE.¹ These tributaries include the Elkhorn River, Salt Creek, Buffalo Creek, and Shell Creek. These multiple inflows provide significant variability that would complicate the isolation of Project effects on water temperature in the lower Platte River.

- Lag Time

Discharge from the Tailrace Canal travels approximately 80 miles before reaching USGS Gage 06805500, Platte River at Louisville, NE. On average, the travel time of flows for this distance is 2 to 3 days. This amount of time allows for significant attenuation of Project effects. The lag time coupled with the inflows of multiple tributaries makes it extremely difficult to isolate Project effects.

¹ USGS Gage 06805500, Platte River at Louisville, NE, was proposed because it is the only existing temperature sensor in the accepted reach of the pallid sturgeon habitat (downstream of the Elkhorn River confluence).

- **Dominant Atmospheric Effects**

Preliminary evaluation of temperature data at USGS Gage 06805500, Platte River at Louisville, NE, indicated that the overriding influence on water temperature appears to be related to solar radiation and atmospheric influences, with no obvious influence from the Project.

Attachment B of
January 27, 2017 District Letter to FERC
RE: Comments on Final Biological Opinion

Docket P-1256-31

ATTACHMENT B

**UNADDRESSED DISTRICT COMMENTS ON THE
MAY 1, 2015, DRAFT BIOLOGICAL OPINION**

Attachment B
Unaddressed District Comments on the May 1, 2015 Draft Biological Opinion

The District provided 61 specific comments on USFWS' May 1, 2015, Draft Biological Opinion, of those only 6 comments related to typographical errors have been addressed (3 comments are no longer relevant due to changes in the Staff Alternative). Although there were numerous minor text revisions throughout the December 16, 2016 Biological Opinion and some mathematical errors were addressed, the District's substantive comments on the Draft Biological Opinion were not addressed in the Final Biological Opinion.

Unaddressed Comments on the Draft Biological Opinion are listed below:

Page 8, second paragraph: The "action area" is not clearly identified in the text or figures, nor is the rationale for what the action area includes, nor why the action area extends from the Project tailrace to the Platte River's confluence with the Missouri River since Project effects cannot be meaningfully detected or measured that far downstream of the Project.

Page 13, fourth paragraph, second sentence: The Draft Opinion states, "Sand is mined at the North SMA by Preferred Sands, a commercial entity whose operations are wholly contained within the Commission's boundaries."

This statement is incorrect. Preferred Sands removes sand from the District's North Sand Management Area (SMA), which is wholly contained within the Commission's boundaries, and pumps it to their processing facility located outside of the Project boundary between the Nebraska Central Railroad and Nebraska Highway 22.

Page 19, "Jeopardy Determination," numbered item 1: As discussed in our *General Comments*, the Draft Opinion incorrectly defines the "environmental baseline" as environmental conditions as they would exist without the Project or action; whereas, case law has established that environmental baselines are supposed to focus on capturing the "pre-action condition" of the endangered or threatened species (or designated critical habitat) that occur in the action area for a consultation.

Page 33, "Present Status of Pallid Sturgeon Population for the Platte River," third paragraph: This paragraph states: "Hamel (2013) estimated that approximately 926 pallid sturgeon are present in the Lower Platte River during the study. This estimate provides a coarse estimate for a dynamic Platte River population with individuals from the CLMU migrating into and out of the Platte River (Chojnacki et al. 2014; Peters and Parham 2008). However, the Service has determined that 926 individuals represent a reasonable estimate given actual captures of 137 individuals with only four recaptures (Hamel et al. 2014a). The small number of recaptures indicates more individuals are present than what is being captured by researchers."

It is important to note that Hamel (2013) "estimated" the number of pallid sturgeon by multiplying the estimated number of shovelnose sturgeon in the lower Platte River by the ratio of pallid sturgeon to shovelnose sturgeon in catches conducted from 2009 to 2012 (1 pallid

sturgeon: 30 shovelnose sturgeon), rather than analysis of mark-recapture data. Hamel (2013) reported that “An estimated $30,870 \pm 2,270$ shovelnose sturgeon occurred in the lower Platte River throughout this study period” (citing unpublished data from J.J. Hammen; page 187, third bulleted point).

A 1:30 ratio between pallid sturgeon and shovelnose sturgeon should produce a pallid sturgeon estimate of 1,029 (953 to 1,105), so Hamel’s estimate must have included an additional variable (or used a 1:33 ratio). The Draft Opinion does not provide the reasoning that led USFWS to determine that this estimate represented the best scientific and commercial data available (as opposed to alternative estimates based on different ratios; for example, the ratios presented in Steffensen et al. (2014)).

Page 36, first paragraph: The second sentence of this paragraph states: “The Service has adopted a population size of 926 pallid sturgeon in the Lower Platte River that will serve as the baseline population for the 30 year evaluation period of this Opinion.” There is no explanation of why the USFWS concluded that 926 pallid sturgeon occur in the lower Platte River, why all of those sturgeon are likely to be exposed to Project effects, and why it does not expect that population to change in size (grow or decline or both) over the next 30 years.

Page 40, last paragraph: This paragraph notes two deceased pallid sturgeon from a fish kill on July 19, 2012 and identifies one deceased pallid sturgeon as occurring near the confluence of Salt Creek and the Platte River, but the location of the second deceased pallid sturgeon is not identified. Without locational information for this dead fish, it is not possible to determine what caused this sturgeon mortality. Without some causal linkage, it would be inappropriate to assume that this sturgeon died as a result of its exposure to Project effects.

Page 41, third paragraph: This paragraph states, “It is reasonable to assume that Lower Platte River exceedances of high stream temperatures are likely to increase over the life of the Project license...Lower Platte River streamflow, even under the No Diversion condition, will be subject to future declines as a result of water development not associated with the Project...Thus, it is reasonable to conclude that pallid sturgeon mortalities in the Lower Platte River would increase as a result of projected increased high temperature events and lower stream flow” (page 57, first bullet). This paragraph argues that USFWS expects pallid sturgeon mortalities in the future to occur even under the No Diversion condition and for reasons unrelated to Project effects; yet USFWS arbitrarily concludes that Project effects (temperature increases) will cause pallid sturgeon mortalities. This conclusion does not follow from the evidence presented.

Page 48, fourth paragraph, second sentence: This sentence incorrectly notes an increase in total streamflow; this should be a decrease.

Page 54, second paragraph: This paragraph determines that the relative condition (currently 0.99 to 0.95) of pallid sturgeon in the Lower Platte River will decrease due to more frequent departures (compared to the fictional environmental baseline) into the lower Missouri River (where relative condition ranges from 0.86 to 0.97); however, the current relative condition of pallid sturgeon of 0.99 to 0.95 in the Lower Platte River already accounts for departures into the

lower Missouri River under hydrocycling conditions; therefore, there is no reason to expect the relative condition of lower Platte River pallid sturgeon to decrease.

Page 55, first full paragraph: This paragraph states, “However, the Project significant reduces streamflow in the *Platte River Bypass Reach* from July through February. The reduced streamflow in *Platte River Bypassed Reach*, under the Staff Alternative, *will* increase the likelihood lethal stream temperatures which *could* harm individuals. The Service has determined that Project diversions affecting individuals in the *Platte River Bypassed Reach* is small given the expected low species use in the reach and the infrequent occurrence of kill reported for the *Platte River Bypassed Reach*. Because of the low species use and infrequent fish kill observations in the *Platte River Bypassed Reach*, the Service expects *one* individual will be harmed (i.e., fish kill mortality) by Project operations within the 30 duration of the Project license” (emphasis added).

The Draft Opinion does not explain why USFWS concludes that Project effects will increase the likelihood of lethal stream temperatures and why it expects one pallid sturgeon to be “harmed” (killed); the conclusion does not appear to follow from the evidence presented. There have been no documented occurrences of pallid sturgeon in the *Platte River Bypassed Reach*; therefore, the logical conclusion should be that no pallid sturgeon would be harmed or killed in the *Platte River Bypass Reach*. The Draft Opinion’s conclusion that one pallid sturgeon would be harmed does not follow logically from the reasoning and evidence presented and does not fairly consider and thoughtfully respond to evidence that would lead to alternative conclusions.

This “analysis” in the Draft Opinion appears to be arbitrary and does not explain why either “determination” logically follows from the evidence presented. The Draft Opinion notes the low incidence of pallid sturgeon mortalities in the Lower *Platte River* and concludes that two pallid sturgeon would be killed. The Lower *Platte River Bypassed Reach* is also noted to have a low incidence of pallid sturgeon mortalities, yet the conclusion is that one pallid sturgeon will be killed. USFWS came to two different conclusions using the same evidence, thus making arbitrary conclusions. If the fish kills that have occurred on the lower *Platte River* have no causal relationship to Project operations or their effects, the Draft Opinion cannot treat them as effects of the Project.

Pages 56 and 57, Pallid Sturgeon - Conclusion: The first sentence of this conclusion states that “After reviewing the current status of the pallid sturgeon, the environmental baseline for the action area, the effects of the Staff Alternative, and the cumulative effects, it is the Service’s Opinion that the Staff Alternative is not likely to jeopardize the continued existence of pallid sturgeon.”

The Draft Opinion reaches seven substantive conclusions about the Project’s probable effects on pallid sturgeon: (1) every pallid sturgeon that occurs in the lower *Platte River* (reportedly, 926 individuals) would be exposed to these effects; (2) exposing all of these individuals to Project effects would affect their feeding and sheltering at some point over the next 30 years; (3) the magnitude of effects on feeding and sheltering would reduce the “condition” of all of these individuals; (4) the magnitude of this reduction in “condition” will “harm” these

individuals; (5) three pallid sturgeon will die as a result of being exposed to Project effects; and (6) four pallid sturgeon will die during monitoring; but (7) the Project is not likely to jeopardize the continued existence of pallid sturgeon because the population affected is relatively large (7,000 to 48,000 individuals) and the species is “stable.” These conclusions are not logically constructed from the evidence presented in the Draft Opinion as noted in previous comments.

Page 57, first bullet: The first sentence of this bullet states, “The Service has determined that the harm of seven (7) pallid sturgeon individuals (i.e., three from fish kills and four from monitoring)....”

Two statements that appear earlier in the Draft Opinion supposedly support this conclusion. Page 54 describes the number of pallid sturgeon that are reported to have died in a fish kill on the lower Platte River in 2012, then concludes that “[G]iven the low incidence of pallid sturgeon mortalities in the *Lower Platte River*, the Service has determined that *two* pallid sturgeon would be harmed (i.e., fish kill mortality) by Project operations within the 30-year operational period of the license” (emphasis added).

These statements raise several questions. First, the fish kill that occurred in the lower Platte River in 2012 was caused by high regional temperatures associated with extended drought conditions throughout the state of Nebraska; those temperatures were not caused by Project operations or the effects of those operations. Given that the fish kill was not caused by the Project, there is no reasonable justification to treat the fish kill as if it were an effect of the Project.

Page 57, third bullet: The first sentence of this bullet states, “The Service has determined that the Staff Alternative would affect the feeding and sheltering of 926 pallid sturgeon in the Lower Platte River at some time *during the 30 years of Project operations* under the Staff Alternative; this effect would reduce the condition of affected individuals” (emphasis added). There are two problems with this conclusion.

First, the Draft Opinion does not explain why USFWS concluded that 926 pallid sturgeon occur in the lower Platte River, why all of those sturgeon are likely to be exposed to Project effects, and why it does not expect that population size to change (grow or decline or both) over the next 30 years. Further, the Draft Opinion does not explain why Project effects are expected to affect *all* pallid sturgeon in the lower Platte River equally, regardless of their distance from the Project and regardless of the intensity of those effects.

Page 75, first paragraph: The fifth sentence of this paragraph states, “We considered data primarily since 2008 which provides the most recent and best available nesting data compared to historic surveys conducted since between 1987 and 2007 for varying years and river segments.”

Several authors have suggested that 10 years of census data should be considered the minimum amount of data necessary to provide a qualitative sense of a population’s status and trend, particularly when observation error is considered (Morris and Doak 2002, also citing Elder et al. 2002, Meir and Fagan 2000). If data on Interior least tern nesting are available since 1987, the

Draft Opinion should reach conclusions based on an analysis of the entire time series rather than just the last 7 years of it. USFWS provides no explanation for why the data prior to 2008 is not suitable for inclusion in the analysis.

Page 75, Table 4: The number of Interior least tern nests on the Loup River Bypassed Reach (32 nests) is incorrect. The correct number is 34 nests for the reasons noted below for Table 5. The number of Interior least tern nests on the lower Platte River (709 nests) is incorrect. The correct number is 697, which is derived from Draft Opinion Tables 6, 9, and 10. Table 9 includes incorrect numbers, as discussed below. Additionally, USFWS conducted surveys along the Loup River in 2013 and 2014 (as noted in the Table 4 footnote), yet these data were not included in the analysis in the Draft Opinion, even though the additional data would have increased the sample size by 50 percent, although the larger sample size is not likely to address the problems with sample size and small effects.

The mean number of nests per year and the 95% confidence interval around that mean would provide more insight into the Interior least tern's status in the action area than the total number of nests (particularly given the wide year-to-year variance in census counts shown in Figure 16). The totals presented in the table cannot support any conclusions about the stability or variability of nesting in these areas.

Page 76, last paragraph: The last sentence of this paragraph states, "The Loup River upstream of the diversion provides a reference for conditions that could be expected under the environmental baseline." As discussed in our *General Comments*, this is an inappropriate use of the term "environmental baseline." It would be more appropriate to just refer to the Loup River upstream of the diversion as a "reference condition."

Page 78, second full paragraph: This paragraph discusses and interprets the data presented in Table 5 (Page 79) but does not provide the 95% confidence intervals (or other confidence interval) associated with the mean values presented in this paragraph.

Using the corrected nest count data as noted below, with 95 percent confidence intervals, the results above the diversion would be: mean = 14.0; 95% CI = 5 to 24; below the diversion the mean = 8.5; 95% CI = 1 to 16. These confidence intervals overlap, which is not surprising given the short time series and small effect sizes. This overlap implies that the differences between these data would not be statistically significant (at $p = 0.05$); that the Project's effect are small, if the Project has an effect on Interior least tern nests; and, more importantly, that the sample size is insufficient to detect the effect the Draft Opinion attempts to assess.

The Draft Opinion presents data on Interior least tern nests from 2008 to 2014 and implies that survey data have been collected since at least 1987. Rather than attempting to detect an effect using a portion of the larger data set, it would be more appropriate to analyze the entire time series. If data on Interior least tern nesting are available since 1987, the Draft Opinion should reach conclusions based on an analysis of the entire time series rather than just the last 7 years of it. USFWS provides no explanation for why the data prior to 2008 is not suitable for inclusion in the analysis.

Page 79, Table 5: For 2010, the number of nests on the Loup River below the diversion (reported as 7 in the Draft Opinion) should be 8 based on the USFWS 2010 report, Table 3. The number of nests downstream of the diversion (reported as 3 in the Draft Opinion) does not include a nest at Colony I, which is shown in the USFWS 2012 report on page 18. Inclusion of Colony I results in 4 nests downstream of the diversion based on the USFWS 2012 report, Tables 6 and 7. Additionally, USFWS conducted surveys along the Loup River in 2013 and 2014 (as noted in the Table 4 footnote), yet these data were not included in the analysis in the Draft Opinion, even though the additional data would have increased the sample size by 50 percent, although the larger sample size is not likely to address the problems with sample size and small effects.

Page 81, third paragraph: This paragraph presents USFWS' estimates of the maximum potential effect of the Project on Interior least tern nesting in the Platte River Bypassed Reach based on nest survey data from North Bend to Leshara (we assume it references data presented in Table 6, Page 85; Table 7, Page 86; and Table 8, page 87). We have several comments on these analyses.

First, nesting survey data have been collected since at least 1987. Rather than base an analysis on data collected in the last seven years, it would be more appropriate and informative to analyze the entire time series or explain why the entire time series is not representative of patterns that have occurred in the past seven years.

Second, the mean for the data presented in Tables 6 and 7 for North Bend to Leshara is 13 (95% CI = 0 to 26); dividing this mean by 23 miles (the distance from North Bend to Leshara) results in an average of 0.57 nests per mile (95% CI = 0 to 1.14). However, the Draft Opinion states that nests per mile average 0.56 to 0.63 (Page 81, third paragraph, first sentence). This suggests that these averages were not calculated from the data in Table 6 or the method was different. The Draft Opinion should explain how these averages were calculated, what data were used in the calculation, and why the data in the table support the conclusion that USFWS reached.

Third, multiplying the maximum number of nests per mile (0.63) by the length of the Platte River Bypassed Reach would not only produce a maximum estimate of the number of nests that might be expected in that river segment, it would overestimate that number because it assumes that nests should be uniformly distributed along the river reach and that the entire 2.1-mile length supports habitat (on Page 81, the Draft Opinion reports that a large, permanently forested island occurs along most of the first mile of the reach below the confluence and that USFWS expected improved habitat conditions to occur in the 1.25 miles downstream of this forested island, so dividing by 2.1 assumes that the entire reach provides suitable habitat). Treating the mean number of nests per mile as the rate variable in a Poisson distribution avoids this assumption; based on that analysis (and assuming a mean value of 0.63), the probability of no nests occurring along the Platte River Bypassed Reach in any given year would be 53.3%; the probability of one nest occurring along the reach would be 33.6%; and the probability of two nests occurring would be 10.6%. The probability of no nests occurring along the Platte River Bypassed Reach (assuming a mean value of 0.63) is 1.2 times greater than the probability of any nests.

Using the mean value calculated from the data in Tables 6 and 7 (0.57 nests per mile), the probability of no nests occurring along the Platte River Bypassed Reach in any given year would be 56.6%; the probability of one nest occurring along the reach would be 32.2%; and the probability of two nests occurring would be 9.2%. The probability of no nests occurring along the Bypassed Reach (assuming a mean value of 0.57) is 1.8 times greater than the probability of any nests.

For comparison, there is also a 56.6% probability of encountering no least tern nests along seven miles of the 23-mile length of the Lower Platte River from North Bend to Leshara. These data suggest that the differences in nest counts in the Platte River Bypassed Reach and North Bend to Leshara are adequately explained by chance and don't reveal any particular effect of the Project.

More importantly, these analyses could only establish that there are differences in the number of nests in the two river reaches. Because these differences could have been caused by random chance, normal variability in nest numbers, regional weather patterns, and similar phenomena that are unrelated to Project effects, these analyses do not establish that these differences are caused by Project effects.

Page 86, second paragraph: This paragraph presents part of the analyses USFWS conducted to estimate the maximum average difference in nest counts resulting from the Staff Alternative and the "environmental baseline." We have several comments on these analyses.

First, the Draft Opinion does not present confidence intervals for its mean estimates, which would provide more information. Using the data presented in Table 7, the estimate from the Tailrace to North Bend is mean: 0.38 nests per mile (95% CI = 0.14 to 0.61); from North Bend to Leshara the estimated mean is 0.62 nests per mile (95% CI = 0.00 to 1.25). Because the estimate from the former (Tailrace to North Bend) is entirely encompassed in the latter, there is no statistically significant difference in these data (at $p = 0.05$). If there is a difference between least tern nesting in these two river reaches, these data cannot reveal it.

More importantly, these analyses could only establish that there are differences in the number of nests in the two river reaches. Because these differences could have been caused by random chance, normal variability in nest numbers, regional weather patterns, and similar phenomena that are unrelated to Project effects, these analyses do not establish that these differences are caused by Project effects.

Page 87, Table 8 and associated text: This table and the associated text continues the analyses USFWS conducted to estimate the maximum average difference in nest counts resulting from the Staff Alternative and the "environmental baseline."

As we commented previously, the analyses would have been more informative if the Draft Opinion presented confidence intervals for its mean estimates. Using the data presented in Table 8 (and ignoring the many problems that result from taking averages of averages), the estimate from the Tailrace to North Bend is mean: 0.43 nests per mile (95% CI = 0.14 to 0.73); from North Bend to Leshara the estimated mean is 0.57 nests per mile (95% CI = 0.00 to 1.13). As

with the data presented in Table 7, the estimate from the former (Tailrace to North Bend) is entirely encompassed in the latter so there is no statistically significant difference in these data (at $p = 0.05$). If there is a difference between least tern nesting in these two river reaches, these data cannot reveal it.

More importantly, these analyses could only establish that there are differences in the number of nests in the two river reaches. Because these differences could have been caused by random chance, normal variability in nest numbers, regional weather patterns, and similar phenomena that are unrelated to Project effects, these analyses do not establish that these differences are caused by Project effects.

Page 89, Table 9 and associated text (Pages 88 to 89 & 91): This table and the associated text contain the analyses used to estimate the number of least tern nests that might be lost to inundation in the Lower Platte River from the Project Tailrace to North Bend and from North Bend to the Missouri River. There are several problems with this analysis.

First, the total number of nests reported in Table 9 for 2008, 2009, and 2011 (reported in the Draft Opinion as 124, 228, and 96, respectively) are incorrect. According to the Brown and Jorgensen 2008 report, Table 2, 114 Interior least tern nests were found from Fremont to the confluence of the Missouri River (which is approximate RM 60 to RM 0). According to the Brown and Jorgensen 2009 report, Table 3, 225 Interior least tern nests were found from Fremont to the confluence of the Missouri River. Finally, according to the Brown, Jorgensen, and Dinan 2011 report, Table 5, 97 Interior least tern nests were found from Fremont to the confluence of the Missouri River. Therefore, the correct total of Interior least tern nests from Fremont to the confluence of the Missouri River is 580.

Second, the analyses ignore the fact that, in most years (57%), no nests are lost to inundation. Because of the variance in the inundation data, the analyses should consider the 95% confidence interval, which is (using corrected data) mean = 0.132 (95% CI = 0.093 to 0.240). We conducted a one-sample z-test to the data on the proportion of nests inundated (the equivalent of a one-sample t-test that applies to proportions) to determine if the average (0.132) proportion was significantly different from zero (at both $p = 0.05$ and $p = 0.01$), and it is not statistically different from zero. That statistical result means that these data can be explained by chance or random variation.

More importantly, these analyses only establish that there is a chance of least tern nests being inundated in the lower Platte River from the Tailrace to North Bend. Because nests can be inundated for reasons unrelated to Project effects, such as random chance, regional weather patterns, and similar phenomena, these analyses do not establish that these differences are caused by Project effects.

Page 90, second paragraph: USFWS discounts the inundation study performed by the District and instead uses inundation probabilities developed by NGPC. The District rebutted NGPC's objections to the District's study and also identified flaws in NGPC's concept of inundation

probability, specifically with respect to Project operations, in a response to comments on the Second Initial Study Report, dated May 11, 2011.

Page 95, Summary of Effects: The first sentence of this section states, “When comparing effects of the Staff Alternative to the Environmental Baseline for all areas within the Project action area, we combined the estimated reduction in nesting at the Loup River Bypassed Reach, Platte River Bypassed Reach and Lower Platte River (tailrace to North Bend), and compared it with the estimated increase in nesting under the Staff Alternative at the North SMA.”

As discussed in our *General Comments* and previously in our comments, this statement misrepresents the analyses contained in the Draft Opinion. The Draft Opinion did not actually compare these effects. Instead, the Draft Opinion used data from different reference areas that it treated as proxies for things like the Staff Alternative, “Environmental Baseline,” Current Operations, etc. The “comparisons of effects” consisted of analyses of differences in mathematical averages between paired data sets for the stream reaches the Draft Opinion used as proxies. In some cases, these analyses detected differences between mathematical averages; in other cases, they did not. In most cases, the data sets were not actually different (the “effects” data set was encompassed within the confidence interval of the “reference” data set) or the differences were statistically insignificant. In the balance of cases, most differences would be too small to be detected by comparing mathematical averages.

Regardless, the analyses in the Draft Opinion detected differences between two data sets but they could not identify the cause of those differences. As we have noted repeatedly in our comments, many of the differences almost certainly resulted from the small data sets used in the analyses. Even when the data sets were large enough to represent an adequate sample, the Draft Opinion made no attempt to show that differences in the data sets were correlated with Project operations (as opposed to correlated with something else), which would have been a prerequisite for establishing that the differences were caused by the Project. Therefore, this analysis is not relevant.

The analytical approach the Draft Opinion uses — depending exclusively on mathematical averages without other descriptive statistics or confidence intervals — does not establish that the differences detected are not due to sampling error, process error, or chance. The Draft Opinion did not consider that the differences it discusses could have been caused by random chance, normal variability in nest numbers, regional weather patterns, and similar phenomena that are unrelated to Project effects.

Page 96, first full paragraph: The fifth and sixth sentences of this paragraph states, “Under the Staff Alternative, we estimate 1.19 nests/year would be lost to inundation. This estimate accounts for inundation above that expected to occur naturally under the Environmental Baseline.”

The information used to develop this estimate has been discounted in our previous comments. Regardless, the analyses in the Draft Opinion only (erroneously) establish that there is a chance of 1.08 least tern nests being inundated from North Bend to the confluence of the Missouri River per year. Regardless of the validity of the estimates, because nests can be inundated for reasons

unrelated to Project effects, such as random chance, regional weather patterns, and similar phenomena, these analyses do not establish that these differences are caused by Project effects.

Page 114, Table 15: This table calculates the mean number of piping plover nests reported from Loup River above and below the diversion weir. A four-year time series (small sample size) is too short to establish differences above and below the diversion with any degree of confidence, particularly when the size of the effect appears to be very small (the difference between 1 and 2, 0 and 3, 1 and 4, and 0 and 1). We can illustrate this problem by calculating confidence intervals for these data. With 95 percent confidence intervals, the data above the diversion would be: mean = 2.5, 95% CI = 1 to 4; below the diversion, the results would be: mean = 0.5, 95% CI = 0 to 1 (although these values should be rounded to whole numbers because it's impossible to have half a nest).

These confidence intervals overlap, which is not surprising given the short time series and small effect sizes. This overlap implies that the differences between these data would not be statistically significant (at $p = 0.05$) and, more importantly, that the sample size is insufficient to detect the effect the Draft Opinion attempts to assess. Rather than analyze this small amount of data, it would be more appropriate to approach the issue qualitatively or abandon the analysis entirely.

Additionally, it should be noted that USFWS conducted surveys along the Loup River in 2013 and 2014 (as noted in the Table 4 footnote), yet these data were not included in the analysis in the Draft Opinion, even though the additional data would have increased the sample size by 50 percent, although the larger sample size is not likely to address the problems with sample size and small effects.

Page 116, Platte River Bypassed Reach - Reproduction: Because of the small sample size and year-to-year variation in the number of reported nests, these analyses should also consider the standard deviation and confidence interval associated with the sample mean. With 95 percent confidence intervals, the results above the diversion would be: mean = 2.5, 95% CI = 1 to 4 (although these values should be rounded to whole numbers because it's meaningless to discuss half a nest). The confidence intervals for mean number of nests above and below the diversion overlap, so the differences between them would not be statistically significant (at $p = 0.05$).

The comparable 95% confidence interval for nests per mile (above the diversion) is 0.0363 to 0.1107. This confidence interval overlaps with the average number of nests estimated for the lower Platte River (0.048 nests per mile), so the differences between these reaches would not be statistically significant either.

The third paragraph of this subsection estimates that 0.16 piping plover nests that would be "lost" under current operations (0.074 nests per mile times 2.1 miles = 0.154; the 95% confidence interval for this estimate would be 0.076 to 0.233). As with the other estimates, this estimate is not significantly different from zero. At a rate of 0.074 nests per mile, the probability of encountering no nests in a 2.1-mile area is 92.87% (95% CI = 89.52 to 96.43%; calculated from a Poisson distribution). In most cases, these values would be rounded to zero.

Page 118, Table 16: This table calculates the frequency and density of piping plover nests in a river reach that represents a “reference condition” (North Bend to Leshara) and “effect condition” (Tailrace to North Bend). However, the sample sizes ($n = 1$ versus $n = 2$) are too small to facilitate meaningful analysis or support any inference. Dividing one number by a second number does not produce an “average” if the numerator is not a sum (a sum of at least two values). It would have been more appropriate to conclude that the data available are insufficient to support meaningful analysis than to conduct the “analyses” presented in this table.

The data in this table suggest one thing: from 2008 to 2012, piping plover rarely nested in either river reach (10 of 13 surveys reported no nests). However, the time series is too short to make any stronger statement. These data could be manipulated to suggest (as the Draft Opinion does) that nest density is 54 percent lower between the Tailrace Return and North Bend (as the Draft Opinion does), but they could also be manipulated to suggest (unlike the Draft Opinion) that piping plover nest twice as frequently between the Tailrace Return and North Bend. These data are insufficient to support the Draft Opinion’s conclusion that Project effects make piping plover less likely to nest in Tailrace to North Bend reach. The appropriate conclusion is that there are insufficient data to support any conclusion even assuming the data represent the “best scientific and commercial data available.”

Pages 120, Table 17: This table calculates the number of piping plover nests in the lower Platte River and inundated from Fremont to the confluence with the Missouri River as a prelude to estimating the number of piping plover nests that would be inundated in the lower Platte River. As with the earlier table (Table 16), the data in this table also suggest that piping plover nest so rarely from Tailrace to North Bend ($n = 2$) or North Bend to Fremont ($n = 1$) that the only appropriate conclusion is that there are insufficient data to support meaningful analysis.

Nevertheless, the Draft Opinion “analyzes” a sample represented by a single number and attempts to compare it with a sample represented by two numbers. Ignoring the data insufficiency problem for the moment, the analyses in the Draft Opinion divide a single value (the 2 nests reported from North Bend in 2009) and presents the result as an “average” (which, as discussed in the previous comment, it is not).

Third, the analyses fails to consider the standard deviation and confidence interval for the various sample means it presents. With 95 percent confidence intervals, the results from Tailrace to North Bend would be: mean = 0.67, 95% CI = 0 to 2; North Bend to Fremont would be: mean = 0.33, 95% CI = 0 to 1; Fremont to the Missouri River: mean = 11.3, 95% CI = 0 to 24; Total number of nests in Lower Platte: mean = 12.1, 95% CI = 0 to 24; Nests inundated: mean 4.29, 95% CI = 0 to 8. If the estimate of the average number of nests inundated per year considered the 95% confidence interval, the result would be: mean = 0.25, 95% CI = 0 to 0.60.

At best, the analyses contained in the Draft Opinion could illustrate the potential magnitude of Project effects, but they could not determine the effects themselves. However, even as an illustration, the confidence intervals for all of these estimates encompass zero (in some cases, because there is so much year-to-year variance), so there is no statistically significant difference

between the mean estimates and zero (at $p = 0.05$). This further demonstrates that the data in this table are insufficient to support meaningful analysis or detect meaningful differences. The appropriate conclusion is that there are insufficient data to support any conclusion even assuming the data represent the “best scientific and commercial data available.”

Finally, the cell labeled “Total due to hydrocycling 0.62” is incorrect. The number “0.62” represents the sum of all of the values presented in the bottom row; however, the column labeled “Total # Nest in Lower Platte” already sums the values in columns 2 through 4 of the table ($0.017+0.009+0.29 = 0.31$). By summing all values in the bottom row, the cell labeled “Total due to hydrocycling 0.62” double counts the values in columns 2 through 4.

Page 121, second full paragraph (beginning “We recognize....”): This is a fair acknowledgment of the limitations of the data presented in Table 17. However, if the “best scientific and commercial data available” consists of a sample represented by a single number and a second sample represented by two numbers, the data are insufficient to support meaningful analysis or detect meaningful differences. Rather than analyze this small amount of data, it would have been more appropriate to approach the issue qualitatively or abandon the analysis entirely.

Page 122, North Bend to Confluence of Missouri River - Reproduction: As discussed in our last two comments, the information presented by USFWS as the “best scientific and commercial data available” consists of a sample represented by a single number and a second sample represented by two numbers. These data are insufficient to support meaningful analysis or detect meaningful differences. Rather than analyze this small amount of data, it would be more appropriate to approach the issue qualitatively or abandon the analysis entirely.

Page 124, North Sand Management Area - Feeding/Fitness: The first sentence of the first paragraph states, “The North SMA is analogous to other off channel plover nesting sites such as sand and gravel mines and housing developments.”

This is incorrect. The North SMA is only analogous to gravel mines and housing developments in that it provides habitat characteristics that plovers find suitable for nesting. Daily human activities differ substantially between the North SMA, and gravel mines and housing developments.

Page 124, Summary of Effects: The third sentence states, “Under the Staff Alternative, we anticipate that the Loup River Bypassed Reach will result in a maximum average decrease of approximately 2.0 nests/year, the Platte River Bypassed Reach to result in a maximum average decrease of approximately 0.16 nest/year, and the Lower Platte River (tailrace to North Bend) to result in a maximum average decrease of approximately 0.33 nests/year.”

As discussed in preceding comments, the data that form the basis for the estimates in this sentence are insufficient to support meaningful analysis or any conclusion.

Page 125, first full paragraph: The first sentence of this paragraph states, “The reported reduction in the number of nests on the Loup and Platte Rivers within the Project action area is

not indicative of an actual reduction in nests, chicks or young at the local or regional population level.”

This sentence indicates that the analysis in the Draft Opinion is hypothetical and is not based on evidence of actual “take” of the species. It should be noted that since listing of the species, there have been zero incidences of “take” associated with Project operations; in fact, as documented in the Draft Opinion, the Project’s North Sand Management Area has resulted in successful nesting year after year.

Page 125, second full paragraph (beginning with “We expect hydrocycling...”): The fifth and sixth sentences of this paragraph state “Under the Staff Alternative, we estimate 0.63 nests/year would be lost to inundation. This estimate accounts for inundation above that expected to occur naturally under the Environmental Baseline.”

As we have discussed previously, it is impossible to conduct a meaningful comparison of a sample represented by a single number and a second sample represented by two numbers. At best, the analyses contained in the Draft Opinion illustrate the potential magnitude of Project effects, but they could not determine the effects themselves. However, even as an illustration, the confidence intervals for the inundation estimates all encompass zero (in some cases, because there is so much year-to-year variance), so there is no statistically significant difference between those estimates and zero (at $p = 0.05$). The data the Draft Opinion uses cannot detect the effect this sentence implies.

In addition, as discussed in our comments on Table 17 (above), the estimate of “0.63 nest/year” represents a double count of the estimated number of nests from the Tailrace to the Missouri River confluence. The “correct” number would be “0.31 nests/year.”

Page 128, first bullet: As discussed in preceding comments, the data that form the basis for the estimates in this sentence are insufficient to support meaningful analysis or any conclusion.

In addition, as discussed in our comments on Table 17 (above), the estimate of “0.62 nest/year” represents a double count of the estimated number of nests from the Tailrace to the Missouri River confluence. The “correct” number would be “0.31 nests/year.”

Page 128, second bullet: As discussed in preceding comments, the data on which the estimates in this bullet are based are insufficient to support meaningful analysis.

Page 130, Amount or Extent of Take (Pallid Sturgeon), first paragraph: The Draft Opinion states, “The Service has determined that Project hydrocycling under the Staff Alternative *will result in the harm of two* individuals in the Lower Platte River via fish kill mortality. *One pallid sturgeon* in the Platte River Bypassed Reach *will be harmed* as a result of death due to lethal water temperatures from reduced flows under the Staff Alternative” (emphasis added).

The Draft Opinion presents the death of these three pallid sturgeon as if they are certain to occur when they are not. The first “estimate” is based on assumptions (that future operations of the

Project “will” cause fish kills, that pallid sturgeon “will” die in those fish kills, and that the number of pallid sturgeon that die “will” be the same as the number that died in the 2012 fish kill on the Platte River)—all without causal connection documentation and without record support per the District’s comments above. Further, the basis for the second “estimate” was never explained and is not justified by the record evidence.

Page 130, Amount or Extent of Take (Pallid Sturgeon), second paragraph: the Draft Opinion states, “The Service has determined that the Staff Alternative would affect the feeding and sheltering of 926 pallid sturgeon in the Lower Platte River at some time during the 30 years of Project operations under the Staff Alternative; this effect would reduce the condition of affected individuals. *The fish affected by the Staff Alternative in the Lower Platte River are expected to maintain an excellent condition, higher than that described for individuals in the adjacent Missouri River.* Therefore, the Service has concluded that the expected condition of individuals under the Staff Alternative, would not limit the self-sustaining status of the species (i.e., limit species recruitment)” (emphasis added). Nevertheless, the Draft Opinion expects the Project to “take” pallid sturgeon through “harm.”

The regulatory definition of “harm” means “an act which *actually* kills or injures wildlife. Such act may include significant habitat modification or degradation *where it actually kills or injures wildlife* by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering” (50 CFR 17.3; emphasis added).

The Draft Opinion does not explain why it expects pallid sturgeon exposed to Project effects “...to maintain an excellent condition, higher than that described for individuals in the adjacent Missouri River” only to conclude that Project effects are expected to “actually kill or injure” those sturgeon by “significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.” A reduction in “condition” that nevertheless leaves pallid sturgeon in “excellent condition” does not seem likely to also “actually kill or injure” them. The conclusion (the Project will “harm” pallid sturgeon) does not follow from the reasoning or evidence the Draft Opinion provides; in fact, it seems more appropriate to conclude that Project effects on sturgeon feeding and sheltering would not be expected to “take” pallid sturgeon.

Page 131, Terms and Condition 1(a): The Draft Opinion does not establish a causal connection between Project operations and water temperatures at the Louisville gage. Furthermore, the District’s Water Temperature study identified a statistically significant relationship between ambient temperature and water temperature and identified no relationship between flow and water temperature; thus water temperature at Louisville is irrelevant to the Draft Opinion analysis.

Page 131, Terms and Conditions 1(b) and 1(c): These conditions imply that water temperature is a surrogate for pallid sturgeon mortality. As noted in our *General Comments*, if the Services uses a surrogate, two standards apply: (1) the Services need to establish that the action they say is likely to incidentally take listed species is likely to cause the change in ecological surrogates rather than some other causal factor or agency (that is, they need to causally connect an effect to the action and disconnect it from other potential causal agents) and (2) the Services must

somehow link the change in those surrogates to the “take” of the species (for example, see *Arizona Cattle Growers Association v USFWS*, 273 F.3d 1229 (9th Circuit 2001)). The Services codified some of these requirements in final regulations published on May 11, 2015 (80 CFR 26845). The analysis in the Draft Opinion does not meet these requirements with respect to Term and Condition 1(b) or 1(c).

Page 132, Terms and Condition 1(d): The Commission is not responsible for monitoring fish kills, this responsibility lies with the Nebraska Department of Environmental Quality (NDEQ). USFWS can, and does, get fish kill reports from NDEQ.

Page 132, Terms and Condition 1(e): Section 7 regulations require Action Agencies to reinstate formal consultation if “the amount or extent of incidental take *is exceeded...*” (50 CFR 402.16(a); emphasis added). By requiring the Commission to reinstate formal consultation when the amount or extent is *reached*, this Term and Condition conflicts with this regulatory requirement to reinstate (see Page 137, Reinitiation Notice). This Term and Condition should be deleted and the opinion should default to the Reinitiation Notice.

Page 132, Terms and Conditions of RPM 2: Given that the Draft Opinion concludes that pallid sturgeon are expected to maintain an excellent condition, regardless of Project effects on feeding and sheltering (Page 57), Project effects on sturgeon feeding and sheltering are not likely to “actually kill or injure” pallid sturgeon; therefore, the Commission and District would not require an incidental exemption for these effects. As a result, RPM 2 and associated Terms and Conditions are unwarranted and inappropriate, and should be deleted.

Page 133, Amount or Extent of Take (Interior Least Tern): As we have commented repeatedly, the Draft Opinion only establishes that current nesting data from different river reaches is different and *assumed* that difference between two mathematical averages (one representing a “without Project” condition, the other representing the “with Project” condition) represents an “effect” of the Project. However, the Draft Opinion does not present any evidence that suggests these “effects” had any statistical or practical significance, were caused by the Project, were not caused by small sample sizes, random chance, sampling error, process error and other phenomena, or were not caused by other phenomena that are unrelated to Project effects.

As discussed in our *General Comments*, the extensive case law on incidental take statements has established clear requirements for Incidental Take Statements. In particular, courts have required the Services to causally connect an effect to the action and disconnect it from other potential causal agents before treating that effect as “take” (for example, see *Arizona Cattle Growers Association v USFWS*, 273 F.3d 1229 (9th Circuit 2001)). The Services codified this requirement in final regulations they published on May 11, 2015 (80 CFR 26845).

The Commission and the District would not require an exemption for eggs and chicks that die for reasons that are unrelated to the Project. Nevertheless, the Draft Opinion establishes that there is a chance of least tern nests being inundated in the lower Platte River from North Bend to the Missouri River confluence. Although nests can be inundated for reasons unrelated to Project effects, such as random chance, regional weather patterns, and similar phenomena, the Draft

Opinion does not establish that these differences are caused by Project effects; the Draft Opinion does not even consider the possibility of other causes. Without evidence or reasoning that establishes that Project effects are likely to cause the inundation that results in the loss of Interior least tern nests, an incidental take exemption for this alleged “take” is unwarranted and inappropriate.

Page 134, RPM 1: Given that the Draft Opinion does not explain why USFWS concluded that the Project is likely to cause the inundation that results in the loss of Interior least tern nests, this RPM and its associated Terms and Conditions are unwarranted and inappropriate, and should be deleted.

In addition, this RPM and its terms and conditions do not minimize the impact of potential nest loss on Interior least terns. Instead it requires the District to fund and conduct a 30-year monitoring study of river flows and stages that replicates studies the District conducted as part of the relicensing process. These studies could not establish that Project effects cause the inundation that supposedly results in the “take” of least tern nests; requiring the District to repeat those studies will not serve the RPM’s purposes and will not minimize the impacts of inundation on least terns. This RPM and its associated Terms and Conditions are unwarranted and inappropriate, and should be deleted.

Page 135, Amount or Extent of Take (Piping Plover): Our comments on this section of the ITS repeat our comments on the Interior least tern section of the ITS: the Draft Opinion does not establish that Project effects cause the “take” of piping plover. The Commission and the District would not require an exemption for piping plover that die for reasons that are unrelated to the Project. Without evidence or reasoning that establishes that Project effects are likely result in the “take” of piping plover, an incidental take exemption for this alleged “take” is unwarranted and inappropriate, and should be deleted.

Page 135, RPM 1: Given that the Draft Opinion does not explain why USFWS concluded that the Project is likely to cause the inundation that results in the “take” of piping plover, this RPM and its associated Terms and Conditions are unwarranted and inappropriate, and should be deleted.

In addition, this RPM and its terms and conditions do not minimize the impact of potential nest loss on Interior least terns. Instead it requires the District to fund and conduct a 30-year monitoring study of river flows and stages that replicates studies the District conducted as part of the relicensing process. These studies could not establish that Project effects cause the inundation that supposedly results in the alleged “take” of piping plover; requiring the District to repeat them will not serve the RPM’s purposes and will not minimize the impacts of inundation on least terns. This RPM and its associated Terms and Conditions are unwarranted and inappropriate, and should be deleted.

Page 137, Reinitiation Notice: The third sentence of the Reinitiation Notice states, “In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.” For the reasons discussed in our *General Comments*, USFWS does

not have the authority to require the Commission to cease all monitoring activities associated with this action; therefore, this sentence should be deleted.

Appendix E, Extended Discussion on Project Hydrocycling: It is unclear how the information in Table 3 is calculated. USFWS needs to provide clarification on the derivation of this information so it can be confirmed.

Appendix E, Extended Discussion on Project Hydrocycling: In Table 5, the range values at North Bend and Louisville are reversed (that is, the listed North Bend values are actually the Louisville values from Table 3, and vice versa).

Appendix F, Literature Cited: The list of literature cited in the Draft Opinion, presented in Appendix F, is extensive, but no District studies are included. The District conducted studies on sedimentation, hydrocycling, water temperature, and flow depletion and flow diversion, among others, as part of the relicensing process. The District submitted the results of these studies in an Initial Study Report, a Second Initial Study Report, an Updated Study Report, and included a compilation of all studies in Volume 3 of its Final License Application, but USFWS did not cite any of these documents in its Draft Opinion.

In addition, there are many inaccuracies in the list of literature cited and in the in-text citations provided throughout the Draft Opinion. Several documents in the list of literature cited are not actually cited in the text of the Draft Opinion. In addition, several references are cited in the text of the Draft Opinion but are not included in the list of literature cited.

There is also an inconsistency in how text copied from other sources is cited. Some text in the Draft Opinion appears to have been copied from the USFWS Interior Least Tern 5-year Review, but the citations for that text are inconsistent. Sometimes the text is referenced as USFWS 2014 and sometimes the in-text citations from the Interior Least Tern 5-year Review have been copied along with the text.

Finally, source information should be provided for all tables in the Draft Opinion. Although the source of the table data is sometimes mentioned in the paragraph prior to the table, it would be clearer to provide a citation to the source underneath each table, similar to what was done for the figures in the Draft Opinion.

Attachment C of
January 27, 2017 District Letter to FERC
RE: Comments on Final Biological Opinion

Docket P-1256-31

ATTACHMENT C

**DISTRICT COMMENTS ON
FINAL BIOLOGICAL OPINION, APPENDIX F, SUPPLEMENTAL SCIENTIFIC AND
COMMERCIAL INFORMATION CONSIDERED IN THE OPINION**

Attachment C

District Comments on Final Biological Opinion, Appendix F, Supplemental Scientific and Commercial Information Considered in the Opinion

Appendix F of the Final Biological Opinion presents “supplemental scientific and commercial information” that is described as having been considered in the Final Biological Opinion. Within Appendix F, Alexander and Schaepe (2015) was used to support the USFWS assertion that there is a sediment deficit downstream of the Project Tailrace. Because Alexander and Schaepe (2015) was not included in the Draft Biological Opinion, and because the Final Biological Opinion relies on this new periodical, the District provides the following information with respect to Alexander and Schaepe (2015) and its relevance to the record.

Background and Record Evidence

The District’s primary concern with language in the Final Biological Opinion and Appendix F is with regard to the persistent assumption by USFWS that a sediment deficit exists at the Tailrace. This assumption is not consistent with the record evidence and is invalid. The record evidence, in fact, listed both physical evidence and site-specific studies that corroborate the clear finding that a sediment deficit does not exist. The physical evidence in the record includes cross section measurements, U.S. Geological Survey (USGS) sediment samples, 8 years of aerial photography, and evidence that the Tailrace Weir has not experienced any undermining. Furthermore, this clear finding of no sediment deficit is supported by the fact, as documented in the record, that the District has not needed to implement any erosion countermeasure since the Project has been in operation (that is, nearly 80 years).

USFWS, in Appendix F, admits to ignoring the cross section surveys and aerial photos provided by the District, asserting that a sufficient amount of time had not passed to evaluate the cross section information, and further alleging that aerial photo examination referenced by USFWS indicated the presence of channel incision. USFWS did not address the USGS sediment samples (provided in the record), which show no coarsening of the bed material, thus contradicting a sediment deficit. In addition, and most significantly, USFWS did not respond to the fact that the Tailrace Weir has not shown any signs of undermining since Project inception (as documented in the record), again showing no signs of a sediment deficit. The USFWS claim to sediment deficit has no basis in the record or elsewhere, but instead appears to be based on USFWS’ speculation that somehow removing some but not all of the bed material at the Diversion must have somehow created a shortfall at the Tailrace, where the river, proven to be a braided river “in regime,” has an abundant oversupply of sediment, with transport and shaping of beds limited only by the flows.

With respect to site-specific studies and supporting literature, USFWS, in Appendix F of the Final Biological Opinion, acknowledged that the District provided studies and study references that support that a deficit does not exist. However, attempting to justify its position despite clear contrary record evidence, USFWS provided a newly mentioned report that it offers in support of their assertion. USFWS references Alexander and Schaepe (2015), which USFWS indicated

“recently described” the sediment deficit downstream of the Tailrace Weir. For the following reasons, the Alexander and Schaepe (2015) report has no scientific value in this particular issue and does not provide support for the USFWS assertion of a sediment deficit.

Comments on Alexander and Schaepe (2015)

The objective of the study by Alexander and Schaepe (2015) was not to address the existence or non-existence of the deficit, a fact that USFWS appears to have misunderstood. Mention of a deficit by Alexander and Schaepe (2015) is incidental to the findings regarding the study objective, which was “to understand if reductions in sediment inputs from bank erosion would substantially affect mass contributions of sediments important to the composition of sandbars in the lower Platte River” (p. 9, Abstract). The study was part of a USACE Cumulative Impacts Assessment focused on potential adverse impacts of bank and shoreline protection measures on species habitat. Conclusions regarding a deficit were incidental to the primary objective and not adequately based on thorough analysis or data interpretation.

Alexander and Schaepe (2015) applied two methods to determine a sediment budget. The first involved sediment transport modeling, of which the authors state “...the hydraulic simulations from the HEC-RAS model were considered to be of low quality...”; therefore, the results were used only qualitatively. The second approach employed the use of sediment transport equations, referred to as an “at-a-station” approach to determine the sediment input from large tributaries and the Platte River, as well as the use of aerial imagery to determine bank erosion/accretion. The sediment balance for each reach was determined by summing the tributary sediment inflows, adding/subtracting sediment erosion/accretion, and comparing it to sediment outflow of each respective reach. If the inputs were greater than the outflows, the reach was determined to be aggradational. Conversely, if the inputs were less than the outflows, the reach was determined to be degradational. Either conclusion depends on the uncertainties in and data used in each input to the budget equation, where even small errors could lead to an incorrect conclusion.

Further, the Alexander and Schaepe (2015) report does not appear to have undergone the standard USGS peer review required for Water Supply papers or other popular USGS publications such as Open File Reports. The report contains grammatical and factual errors, indicating that no peer, or even editorial review, was conducted. No such review is indicated in the document.

Appendix F states that the at-a-station approach [by Alexander and Schaepe (2015)] “‘identified’ sediment deficits within the Loup segment of the Platte River,” and the remainder of Appendix F makes it clear that USFWS interpreted the report as having scientifically established the existence of the asserted deficit. Contrary to the USFWS claims, Alexander and Schaepe (2015) provide far more evidence of uncertainty with respect to determining a deficit, than they do evidence sufficient to presume that the study proves the long-standing but incorrect hypotheses regarding a “deficit.”

For example, Alexander and Schaepe’s (2015) own words describe their reservations regarding the value of the study, such as:

The estimation of bed-material-transport capacity and subsequent calculation of a sediment budget involves many uncertainties and simplifying assumptions associated with channel hydraulics, bed-material grain-size distributions, riverbank material grain-size distributions, and bank heights.... (p. 47)

The uncertainties associated with estimation of sediment transport and sediment yields can be large enough to overshadow the ability of a sediment-budget analysis to detect longitudinal imbalances in the sediment system.... (p. 47)

When the uncertainty of the mean estimates was considered, three of the four study segments had 'indeterminate' bank-adjustment conditions, indicating that the balance between bank erosion and accretion was 'too close to call' if uncertainty was considered. (p. 57)

Additional investigation, including a more robust, comprehensive treatment of uncertainty is recommended to test hypotheses regarding excess bed-material transport capacity in the Loup segment. (p. 63)

Likewise, the predictive application of sediment transport equations using the hydraulic geometries of the LPR [lower Platte River] at streamgages, all of which are located at bridge crossings, may not be representative broadly of the hydraulic geometry throughout the LPR. The sediment budgets developed using the HEC model and SIAM tool also contain inherent uncertainty because the models were informed by channel geometry and hydraulics deemed to be of poor quality.... (p. 66)

With regard to the credibility of the study results, including the disputed issue of the deficit, the authors conclude that:

The study summarized in this report has substantial uncertainties and limitations, ranging from uncertainties associated with representativeness [*sic*] of sampled grain sizes of the tributaries, riverbed, and riverbanks, to the large uncertainties associated with empirical sediment-transport equations. Also, some inaccuracy is inherent with the digitized GIS datasets used for estimations of annual bank erosion and accretion. (p. 66)

In contrast, the authors report that:

A similar analysis of bed stability by the USACE (2011) at several sites along the LPR concluded that no clear or consistent spatial or temporal pattern of bed-elevation change was apparent in the LPR. (p. 19)

Conclusion

Most reasonable scientists who would make the statement on p. 66 and elsewhere would not be willing to assert that the study provides anything useful to resolving the issue of a deficit. As

such, the USFWS should reconsider any use of the Alexander and Schaepe (2015) study in developing Biological Opinions, and should remove all reference to, and reliance on, that study.

By virtue of this obvious effort to diminish the controversy over the existence of a deficit, it is clear that USFWS has completely disregarded the extensive record evidence that no such deficit exists. Substantial evidence refuting this was provided by the District, most recently in Appendix C of its June 15, 2105, letter. No scientific rebuttal of the record evidence supporting the District's position has been submitted by USFWS into the record earlier or in Appendix F, nor does the Final Biological Opinion adequately acknowledge that substantial scientific record evidence refutes this claim. Failure to revise the Final Biological Opinion to remove all reference to, and reliance on, the Alexander and Schaepe (2015) study further demonstrates that the Final Biological Opinion is not based on substantial record evidence and is flawed. Reliance by the Commission on an unrevised Final Biological Opinion would be arbitrary and capricious.