REVIEW OF APPLICATION FOR RECERTIFICATION BY THE LOW IMPACT HYDROPOWER INSTITUTE OF THE BOWERSOCK PROJECT, LIHI #15

Prepared by Stephen Byrne
June 30, 2020

I. INTRODUCTION

This report summarizes the review findings of the application submitted by Bowersock Mills and Power Company (Applicant) to the Low Impact Hydropower Institute (LIHI) for recertification of the Bowersock Hydroelectric Project FERC (P-13526). The Bowersock Hydroelectric Project is a run-of-river facility located on the Kansas River in Lawrence, Kansas. The Project was first Low Impact Certified as LIHI #15 effective July 27, 2004 and was recertified in 2009 and 2015. The 2015 certification expired on July 9, 2019 and was extended to October 23, 2019, March 31, 2019 and finally to July 15, 2020.

On April 27, 2020 LIHI received a complete application package for recertification of the Project. Since the previous certification in 2015, the Applicant has completed all its recreational improvements and revised its Exhibit G drawing to correct an error were a kiosk was outside the Project boundary. Because these changes affect environmental resources that are addressed by LIHI's criteria, they are considered a "material change" as defined in the LIHI Certification Handbook. It should be noted that these recreational improvements should be considered a positive material change. There have also been material changes in the LIHI Criteria and certification process since the Project was last certified, in that an updated Certification Handbook has been published by LIHI. This current review was made using the new 2nd Edition LIHI Certification Handbook (Revision 2.04, April 1, 2020).

II. PROJECT'S GEOGRAPHIC LOCATION

The Project is the only FERC licensed hydroelectric project in Kansas (there is one exempt conduit project at the Wichita Water Department). The Project is located at river mile 52.4 on the Kansas River (also known as the Kaw) in Douglas County, Kansas and consists of two separate powerhouses (north and south) built along the same dam (Figure 1). The Kansas River flows approximately 148 miles from its origin in Junction City, Kansas and flows east to its confluence with the Missouri River in Kansas City, and then to the upper Mississippi River in St. Louis, Missouri. The Kansas River at Lawrence is confined by a levee on the north side of the river which was constructed by the US Army Corps of Engineers in 1953. There are no upstream dams with downstream fish passage. The downstream Johnson County Water District No. 1

(Water One) Weir is a low water weir designed to inundate water intakes for Johnson County Water One. It is not a complete dam and no upstream fish passage is necessary.

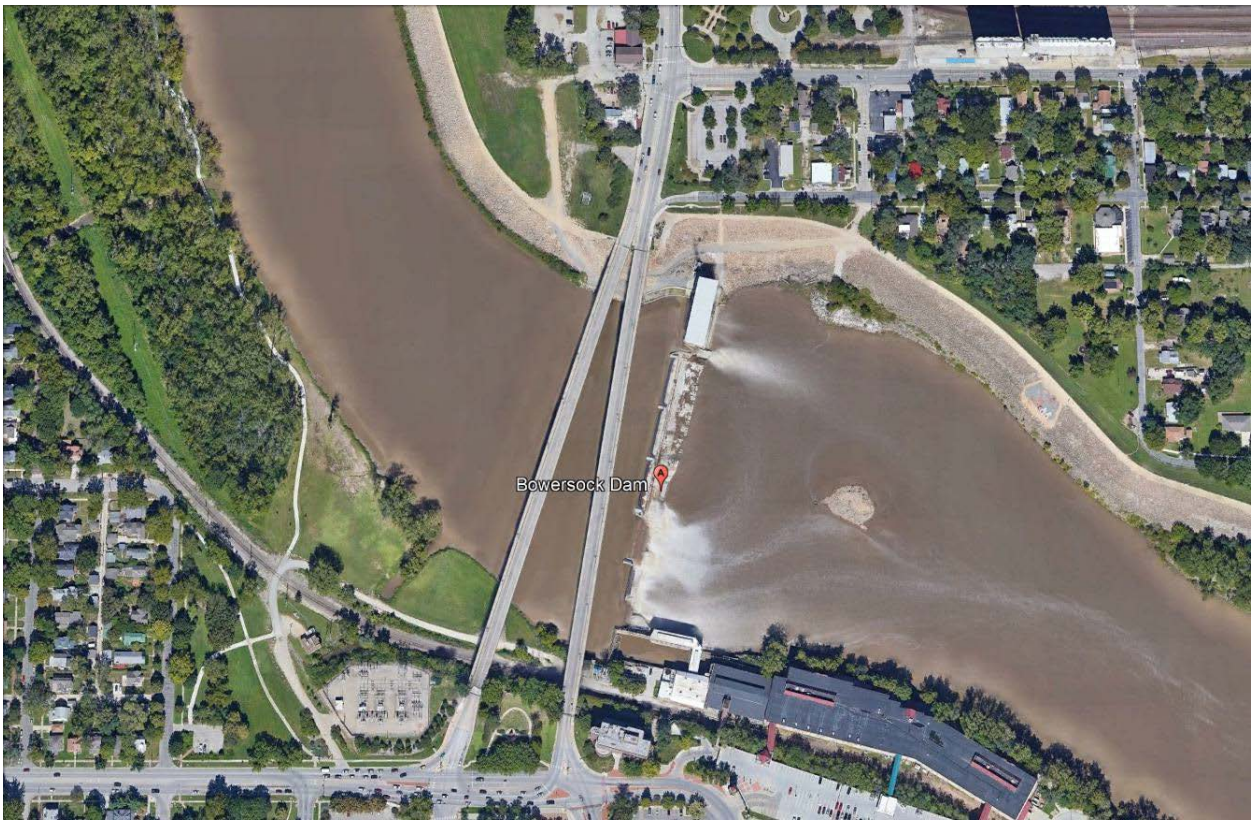

Figure 1 – Bowersock Hydroelectric Project

III. PROJECT AND IMMEDIATE SITE CHARACTERISTICS

The Bowersock dam is 655 feet long from the north side of the south powerhouse flume to the north powerhouse with a crest elevation at 808 feet NGVD and an approximate height of 17.08 feet. The southern 1/3 of the dam is a masonry block dam. The body of the dam is approximately 8 feet in width, and the downstream face of the dam in the timber crib portion has a stair-step structure, which ends in vertical sheet pile wall at various distances from the dam. The Applicant maintains the authorized impoundment or "Millpond" height of 813.5' NGVD through five separate headgate structures. The South Obermeyer section consists of fifteen individual 10-foot Obermeyer flashboards and is located at the southern end of the dam. The center of the dam is topped by four separate rubber bladders, all of which operate independently from one another. The fifth control structure is the North Obermeyer Gate, which is a 20-foot gate located at the northernmost end of the dam.

The south Obermeyer gates have a combined capacity of 5,250 cfs while the north Obermeyer

gate has a capacity of 1,500 cfs. The south powerhouse has a total capacity of 2,300 cfs and houses seven turbine/generator units and the following trashrack spacings: Unit #1: 1.75 inch, Units #2 - #6: 2.25 inch, Unit #7 & partial #6: 2.5 inch. The north powerhouse has a capacity of 4,700 cfs and houses four turbine/generator units with a trashrack spacing of 4 inches. As a whole, the Project capacity is 7 MW with an average annual generation of 22,277 MWh. The Project operates in a run-of-river mode.

Recreational facilities at the Project include a new pedestrian footpath and a new canoe portage trail along the north bank of the Bowersock Millpond, a new fishing deck, with trash receptacles, at the tailrace of the north powerhouse, and two kiosks with signage related to the hydropower Project located just below the City of Lawrence recreation path and immediately above the north powerhouse fishing deck, as well as on the levee path north of the north powerhouse.

IV. ZONES OF EFFECTAND STANDARDS SELECTED

Two Zones of Effect (ZOE) were designated by the Applicant and were determined to be appropriate. Zone 1 is the impoundment within the riverbanks upstream of the Bowersock Dam (Figure 2). This is a relatively shallow, silted-in millpond with an average depth of 3 feet or less. Zone 2 is the Project tailwater below the dam extending 0.92 miles downstream to the City of Lawrence Wastewater Treatment Plant Outfall on the south bank of the river (Figure 3). Zone 2 is shallower with a mix of silt, sand, and rock bottom.

Table 1 below shows the standards selected for each criterion for the two ZOEs. The reviewer agrees with the selected standards.

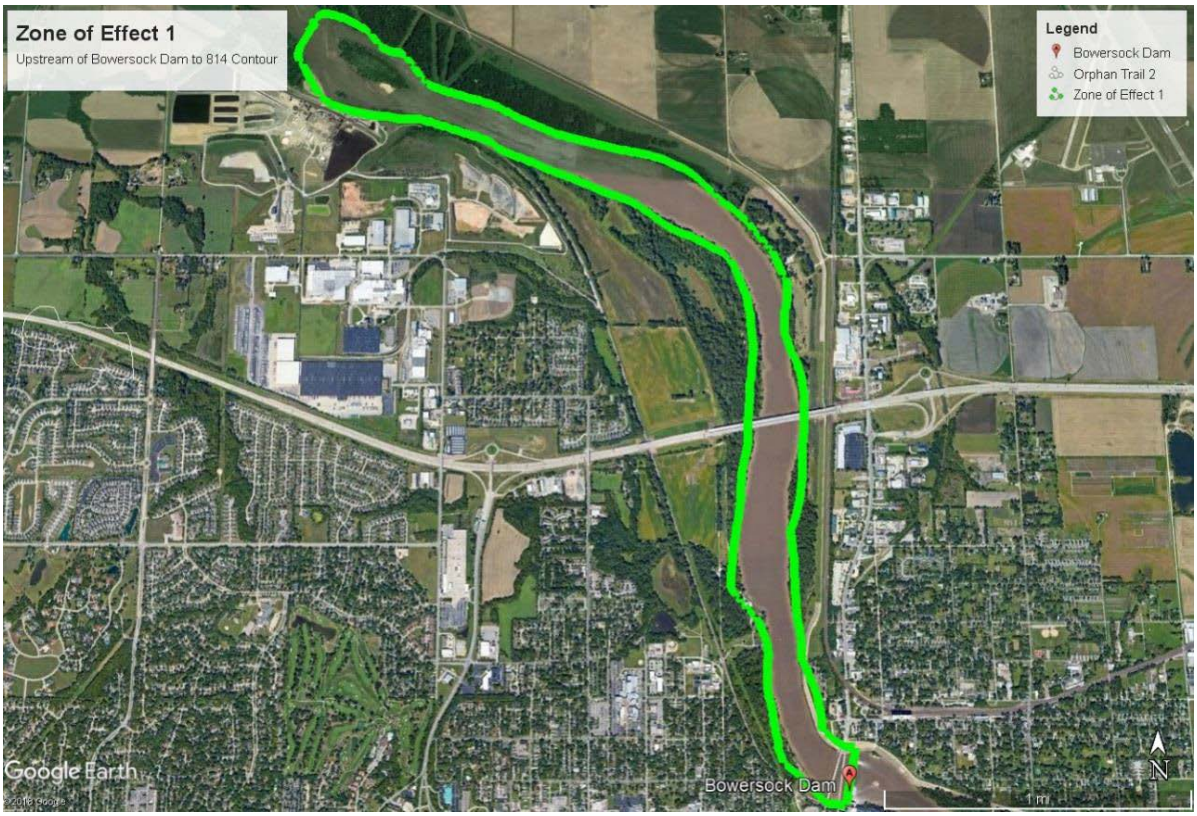

Figure 2 – Bowersock Hydroelectric Project Zone of Effect 1.

Figure 3 – Bowersock Hydroelectric Project Zone of Effect 2.

Table 1. Standards Matrix for the Bowersock Project.

		CRITERION and STANDARD SELECTED							
Zone No., Zone Name, and Standard Selected (including PLUS if selected)	**River Mile at upper and lower extent of Zone**	***A***	***B***	***C***	***D***	***E***	***F***	***G***	***H***
		Ecological Flows	**Water Quality**	**Upstream Fish Passage**	**Downstream Fish Passage**	**Shoreline and Watershed Protection**	**Threatened and Endangered Species**	**Cultural and Historic Resources**	**Recreational Resources**
1: Impoundment	RM 52.4 to RM 55.7	1	2	1	2	1	3	1	2
2: Downstream Reach	RM 52.4 to RM 51.48	1	2	2	1	1	3	1	2

V. REGULATORY AND COMPLIANCE STATUS

The original certified Project was FERC-Exempt (P-2644) and had one powerhouse (South Powerhouse), manually-raised wooden flashboards, an authorized millpond maximum elevation of 812 NGVD, and a capacity of 2.35 MW. A new FERC license in August 2010 granted the Applicant permission for the replacement of the old spillway with a new powerhouse with four, vertical, fixed blade turbine generator sets with a capacity of 4.65 MW, and an increase in the approved millpond height from 812 NGVD to 813.5 NGVD. In a subsequent addendum to the license, FERC granted approval for the replacement of the manually-raised, wooden flashboard system with a rubber dam. The expansion was initiated in June of 2011 and completed in December 2012, resulting in a total project capacity of 7 MW with an average estimated annual generation of approximately 33,000 MWh, although the recertification application states 22,277 MWh over the period from 2013 - 2019. The Applicant filed revised Exhibit G to FERC on February 26, 2020 that is pending approval.

VI. PUBLIC COMMENT RECEIVED OR SOLICITED BY LIHI

The application was posted for public comment on April 27, 2020 and the notice was forwarded to agencies and stakeholders listed in the application. The deadline for submission of comments on the LIHI certification application was June 26, 2020. No formal comments were submitted. Based on the completeness of the application and documents available on the FERC elibrary, the reviewer did not need to contact resource agencies.

VII. DETAILED CRITERIA REVIEW

A. ECOLOGICAL FLOW REGIMES

Goal: The flow regimes in riverine reaches that are affected by the facility support habitat and other conditions suitable for healthy fish and wildlife resources.

Assessment of Criterion Passage: The Applicant has appropriately selected Standard A-1, Not Applicable/De Minimis Effect for both Zones.

The Project operates in a run-of-river mode with no useable storage and operations are managed by the Project's Operations Monitoring Plan required by Article 402 of the FERC license. There are no minimum flow releases required at the Project. The impoundment is maintained at 813.5 feet (+/- 6 inches). Except for maintenance drawdown events, water (including run-of-river operation) is managed via the north and south powerhouses and the headgate structures (Obermeyer gates and a rubber dam). The rubber dam consists of four separate air bladders that can be inflated with a low-pressure blower system, which may be inflated or deflated to allow

the passage of excess flows. When river flows increase or decrease (in excess of North Obermeyer Gate capacity [1,500 cfs]), staff is alarmed to address the issue. For increases in flow, the rubber dams are automated such that sections 1-4 deflate sequentially to pass excess water. Rapid and significant decreases in flow are addressed via supervisory control and data acquisition (SCADA) alarms which indicate that the millpond is facing a potential compliance issue.

River flows upstream and downstream of the dam are monitored using three separate gauges. For flows upstream, the Applicant uses the USGS Lecompton Station 0689100 gage, the USGS Kansas River at Lawrence, KS Station 06891080 gage, and the Applicant's North Powerhouse millpond gage. For flows downstream, the Applicant uses its North Powerhouse tailwater gage, the USGS Kansas River at Lawrence, KS Station 06891080 gage, and the USGS DeSoto Station 06892350 gage.

A review of the Project's annual compliance letters to LIHI and FERC eLibrary indicated that no violations in flow operations have occurred during the current Low Impact certification period.

Based on my review of the application, supporting documentation, and publicly available information, the Project is operated in a manner such that flows support habitat and other conditions suitable for healthy fish and wildlife resources. As such, the Project continues to satisfy the Ecological Flow Regimes criterion.

B. WATER QUALITY

Goal: Water Quality is protected in waterbodies directly affected by the facility, including downstream reaches, bypassed reaches, and impoundments above dams and diversions.

Assessment of Criterion Passage: The Applicant appropriately selected Standard B-2, Agency Recommendation for both Zones.

The lower Kansas River in the vicinity of the Project is listed as impaired by the Kansas Department of Health and Environment (KDHE) due to high concentrations of total suspended solids, total phosphorous, and Escherichia coli (E. coli). However, KDHE informed the Applicant in a letter dated December 3, 2019 that the Project does not introduce pollutants that cause or contribute to the impairments mentioned previously. Specifically, KDHE stated that given the flow-through nature and long-standing presence on the river, KDHE does not believe the Project impairs the river and actually may act as a barrier to the upstream spread of invasive Asian carp and therefore protects the upper portions of the Kansas River from the impacts of this invasive species.

Water Quality Certification Condition 8(h) recommended the Applicant prepare a Spill

Prevention and Response Plan. The Applicant most recently revised its Water Quality Protection/Spill Prevention and Response Plan in February 2020 so that it applies to both powerhouses. The plan contains provisions for the management of oils used in necessary Project equipment (powerhouse generators, gate positioner skids, and trash rakes), storage of oils, and reporting of oil releases.

In the fall of 2015, the Applicant applied for a National Pollutant Discharge Elimination System wastewater permit. The permit requires monthly inspections of the powerhouse outfall channels to ensure compliance with water quality standards, as well as records documenting the results of all monitoring and inspections to be provided to KDHE staff upon request. Additionally, any violations of the water quality standards must be reported to KDHE within 24 hours.

A review of the Project's annual compliance letters to LIHI and eLibrary indicated that no violations in Water Quality Criterion have occurred during the current Low Impact certification period

Based on my review of the application, supporting documentation, and publicly available information, the Project does not impact water quality in the river and continues to satisfy the Water Quality criterion.

C. UPSTREAM FISH PASSAGE

Goal: The facility allows for the safe, timely, and effective upstream passage of migratory fish. This criterion is intended to ensure that migratory species can successfully complete their life cycles and maintain healthy populations in areas affected by the facility.

Assessment of Criterion Passage: The Applicant appropriately selected Standard C-1, Not Applicable/De Minimis Effect for Zone No. 1 (Impoundment) and Zone No. 2 (Downstream Reach).

The Kansas River contains a diverse fish community that is common amongst tributary rivers in the Mississippi River Basin and includes "ancient" non-teleost species (lampreys, sturgeon, paddlefish, and gar species), herring, cyprinids, suckers, catfish, sunfish, walleye, and drum. American eel is the only migratory species in the vicinity of the Project. There are no anadromous species in either Zone of Effect.

There are no barriers to upstream passage in the impoundment Zone of Effect. The Bowersock Dam has been identified by natural resource agencies as a barrier to upstream migration under nearly all conditions with the exception of significant flood events. Since the original LIHI certification in 2004, both federal and state agencies have recommended that fish passage not be implemented at the Bowersock Dam to prevent additional spread of invasive species (Asian

carp) in the Kansas River. This recommendation has continued since that time, with the most recent letters maintaining that recommendation dated December 10, 2019, from the US Fish and Wildlife Service and December 17, 2019, from the Kansas Department of Wildlife, Parks and Tourism.

Based on my review of the application, supporting documentation, and publicly available information, the Project continues to satisfy the Upstream Fish Passage criterion.

D. DOWNSTREAM FISH PASSAGE AND PROTECTION

Goal: The facility allows for the safe, timely, and effective downstream passage of migratory fish. For riverine (resident) fish, the facility minimizes loss of fish from reservoirs and upstream river reaches affected by Facility operations. All migratory species are able to successfully complete their life cycles and maintain healthy populations in the areas affected by the Facility.

Assessment of Criterion Passage: The Applicant selected Standard D-2, Agency Recommendation for the Impoundment Zone of Effect and Standard D-1, Not Applicable/De Minimis Effect for the Downstream Reach Zone of Effect.

As noted in the Application, the areas adjacent to the Kansas River now exhibit more urban development with an increase in channelization for the purpose of flood management. The channelization of the river has created a segregation of fish species based on their tolerance to localized water quality, turbidity, and velocity. Lower reaches of the Kansas River below the Bowersock Dam contain more macrohabitat generalist and tolerant species including channel catfish, freshwater drum, common carp, largemouth bass, and white crappie, which are species that prefer low velocity habitats. Fish species in the upper reaches of the Kansas River tend to be more fluvial specialists such as: blue sucker, central stoneroller, flathead catfish, sand shiner, shovelnose sturgeon, and shorthead redhorse. As noted for the Upstream Fish Passage criterion, American eel is the only migratory species that may occur in the vicinity of the Project.

In support of its selected Standard D-2 for the Impoundment Zone, the Applicant restates that US Fish and Wildlife Service and Kansas Department of Wildlife, Parks, and Tourism recommended against installing fish passage at the Bowersock Dam in order to prevent additional spread of invasive Asian carp. The US Fish and Wildlife Service also noted in its letter dated December 10, 2019 that the impoundment is more similar to that of a shallow lake than what the Kansas river was historically like and thus one would not expect imperiled riverine species to congregate directly above the dam. This suggests that the agency does not feel there is a current need for downstream passage at the Project.

The Applicant appropriately selected Standard D-1 for the Downstream Reach Zone because whence in this zone there are no barriers to downstream movement.

Based on my review of the application, supporting documentation, and publicly available information, the Project continues to satisfy the Downstream Fish Passage and Protection criterion.

E. SHORELINE AND WATERSHED PROTECTION

Goal*:* The Facility has demonstrated that enough action has been taken to protect, mitigate and enhance the condition of soils, vegetation and ecosystem functions on shoreline and watershed lands associated with the facility.

Assessment of Criterion Passage: The Applicant appropriately selected Standard E-1, Not Applicable/De Minimis Effect for both Zones.

There are no specific agency recommendations and the Project does not have, nor is required to have, a specific watershed land protection plan. There are no lands of ecological significance in the vicinity of the Project that are under the Applicant's ownership. As noted above, the Project area has undergone a lot of urban development and is primarily located within urban parkland, riparian corridor and cultivated fields.

Based on my review of the application, supporting documentation, and publicly available information, the Project is operated in a run-of-river manner that has a de minimis effect on the watershed. Therefore, the Project continues to satisfy the Shoreline and Watershed Protection criterion.

F. THREATENED AND ENDANGERED SPECIES PROTECTION

Goal: The facility does not negatively impact federal or state listed species.

Assessment of Criterion Passage: The Applicant appropriately selected Standard F-3, Recovery Planning and Action, for both Zones.

Based on a US. Fish and Wildlife IPaC review (Appendix A), federally-listed species that may occur in the Project area and are protected under the Endangered Species Act include: mead's milkweed (threatened), western prairie fringed orchid (threatened), pallid sturgeon (endangered), and northern long-eared bat (threatened). There is no federally-designated critical habitat in either Zone of Effect. Several bird species protected under the Migratory Birds Treaty Act and the Bald and Golden Eagle Protection Act may also be observed in the Project area and include: American bittern, American golden-plover, bald eagle, black rail, black-billed cuckoo, bobolink, buff-breasted sandpiper, dunlin, eastern whip-poor-will, henslow's sparrow, hundsonian godwit, Kentucky warbler, king rail, least bittern, lesser yellowlegs, prothonotary warbler, red-headed

woodpecker, rusty blackbird, semipalmated sandpiper, short-billed dowitcher, and wood thrush.

State-listed species that occur in Douglas County and may occur in the Project area include sturgeon chub, shoal chub, plains minnow, flathead chub, silver chub, sicklefin chub, western silvery minnow, snowy plover, and eastern spotted skunk. Critical habitat in the Kansas River in Douglas County has been destinated for the following state-listed species: flathead chub, plains minnow, shoal chub, silver chub, and sturgeon chub.

The US Fish and Wildlife Revised Recovery Plan for Pallid Sturgeon[1] states that in 1952 six juvenile specimens were collected below the Bowersock dam during a period of record flooding. However, because the dam was installed prior to pallid sturgeon being identified as a species, there is little historical occupancy data for reaches upstream. The downstream Johnson County Weir (built in 1967) is another potential barrier to pallid sturgeon movement in the lower Kansas River. As of 2014, 15 pallid sturgeon, most confirmed to be of hatchery origin have been collected from the lower Kansas River, however there are no recent observations of pallid sturgeon in the immediate Project vicinity. The recovery plan recommends that agencies evaluate the need for passage of pallid sturgeon at the Bowersock dam and restore passage if deemed necessary. As noted previously for Criterion C – Upstream Fish Passage, US Fish and Wildlife Service and Kansas Department of Wildlife, Parks, and Tourism recommended against installing fish passage at the Bowersock Dam in order to prevent additional spread of invasive Asian carp. Additionally, in its letter to the Applicant, dated December 10, 2019 regarding fish passage and threatened and endangered species that could be impacted by Bowersock Dam, US Fish and Wildlife Service state that in their opinion the continued operation of the Bowersock Dam is not likely negatively impacting the pallid sturgeon.

The state of Kansas has a single recovery plan for the sickelfin chub, sturgeon chub, and western silvery minnow. Management activities for maintaining species populations and species recovery include reviewing current activities in areas of critical habitat to reduce impacts leading to loss of habitat diversity, and work with other state and federal agencies to identify opportunities to re-create habitat conditions needed by the species. Because the Project operates in a run-of-river mode and within the requirements of is water quality certificate and NPDES permit, it does not impact the loss of aquatic habitat diversity and is in compliance with the recovery plan.

For the listed terrestrial species (least tern, snowy plover, eastern spotted skunk, and the federally listed plants, the Bowersock Project only has a 200-ft buffer around the water and minor urban/park type lands for their powerhouses. Therefore, the Project is not likely to have an

[1] https://ecos.fws.gov/docs/recovery_plan/Pallid%20Sturgeon%20Recovery%20Plan%20First%20Revision%20signed%20version%20012914_3.pdf

adverse impact on these species.

Based on my review of the application, supporting documentation, and publicly available information, I find that the Project continues to satisfy the Threatened and Endangered Species criterion.

G. CULTURAL AND HISTORIC RESOURCE PROTECTION

Goal: The facility does not unnecessarily impact cultural or historic resources that are associated with the Facility's lands and waters, including resources important to local indigenous populations, such as Native Americans.

Assessment of Criterion Passage: The Applicant appropriately selected Standard G-1, Not Applicable/De Minimis Effect in both Zones.

During the FERC licensing of the Project in 2010, the Kansas Historical Society commented that the construction and operation of the Project would not adversely affect any property listed or eligible for listing in the national register of historic places. A review of the National Register database did not find any cultural or historic resources in either Zone of Effect.

Based on a review of eLibrary and Applicant's annual compliance letters to LIHI, there does not appear to be any concern over Project operation and maintenance on cultural or historic resources. Therefore, based on my review of the application, supporting documentation, and publicly available information, the Project continues to satisfy the Cultural and Historic Resource Protection criterion.

H. RECREATIONAL RESOURCES

Goal: The facility accommodates recreation activities on lands and waters controlled by the facility and provides recreational access to its associated lands and waters without fee or charge.

Assessment of Criterion Passage: The Applicant appropriately selected Standard H-2, Agency Recommendations in both Zones.

Article 405 of the 2010 FERC License Order required the Applicant to develop and file with FERC a Recreation Plan to improve recreation resources at the Project. The Plan included the following items: (1) a new pedestrian footpath and new canoe portage trail along the north bank of the Bowersock Millpond; (2) a new fishing deck, with trash receptacle and trash removal, at the tailrace of the north powerhouse; (3) a kiosk at the north powerhouse and a kiosk on the Army Corp's flood protection levee and associated signage; (4) a discussion of how the needs of the disabled were considered in the planning and design of the recreation facilities; (5) the entity,

or entities, responsible for operating and maintaining the new project recreation facilities; (6) a description of soil erosion and sediment control measures to be used where ground-disturbing activities are proposed; and (7) an implementation schedule.

While producing the report on completed facilities associated with the Recreation Plan in November 2019, the Applicant noticed that the kiosk had been installed outside the FERC Project boundary and informed FERC that it would revise its Exhibit G drawing to address the issue. The Applicant also noted to FERC in November 2019 that at the request of stakeholders it replaced the required kiosks with interpretive signage to maintain consistency with other interpretive signage in the community. The Applicant filed its revised Exhibit G with FERC on February 26, 2020, and documentation of completion of all required recreation facilities, and copies of stakeholder consultation, on March 13, 2020. On March 25, 2020 FERC informed the Applicant that the March 13 photographs provide adequate documentation that the required recreation facilities were completed in substantial conformity with the recreation plan and that the revised Exhibit G would be addressed in a separate proceeding that has yet to be issued by FERC.

Based on my review of the application, supporting documentation, and publicly available information, the Project continues to satisfy the Recreational Resources criterion.

VIII. GENERAL CONCLUSIONS AND REVIEWER RECOMMENDATION

Based on my review, I believe that the Project continues to meet the requirements of Low Impact Certification and recommend it be re-certified for a five-year period with no conditions.

APPENDIX A – FWS IPaC Report

IPaC Information for Planning and Consultation **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Douglas County, Kansas

Local office

Kansas Ecological Services Field Office

(785) 539-3474
(785) 539-8567

2609 Anderson Avenue
Manhattan, KS 66502-2801

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Northern Long-eared Bat Myotis septentrionalis — Threatened
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/9045

Fishes

NAME	STATUS
Pallid Sturgeon Scaphirhynchus albus No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7162	Endangered

Flowering Plants

NAME	STATUS
Mead's Milkweed Asclepias meadii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/8204	Threatened
Western Prairie Fringed Orchid Platanthera praeclara No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1669	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/

birds-of-conservation-concern.php

- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
American Bittern Botaurus lentiginosus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/6582	Breeds Apr 1 to Aug 31
American Golden-plover Pluvialis dominica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere

Bald Eagle *Haliaeetus leucocephalus** This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Black Rail *Laterallus jamaicensis** This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/7717	Breeds Mar 1 to Sep 15
Black-billed Cuckoo *Coccyzus erythropthalmus** This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink *Dolichonyx oryzivorus** This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Buff-breasted Sandpiper *Calidris subruficollis** This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9488	Breeds elsewhere
Dunlin *Calidris alpina arctícola** This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Eastern Whip-poor-will *Antrostomus vociferus** This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
Henslow's Sparrow *Ammodramus henslowii** This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3941	Breeds May 1 to Aug 31
Hudsonian Godwit *Limosa haemastica** This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Kentucky Warbler *Oporornis formosus** This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20

King Rail Rallus elegans This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5
Least Bittern Ixobrychus exilis This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/6175	Breeds Aug 16 to Oct 31
Lesser Yellowlegs Tringa flavipes This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Prothonotary Warbler Protonotaria citrea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker Melanerpes erythrocephalus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Semipalmated Sandpiper Calidris pusilla This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Short-billed Dowitcher Limnodromus griseus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this