



Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271
<http://dnr.state.il.us>

Pat Quinn, Governor
Marc Miller, Director

January 16, 2014

Dave Wethington P.E.
GLMRIS Project Manager
U.S. Army Corps of Engineers - Chicago District
231 S. LaSalle Street, Suite 1500
Chicago, IL 60604

RE: Proposed GLMRIS - Brandon Road Project, Scoping Comments
County: Will

Dear Mr. Wethington:

The Illinois Department of Natural Resources has received your request for comments for the NEPA scoping process regarding a project near the Brandon Road Lock and Dam proposed as part of the Great Lakes and Mississippi River Interbasin Study (GLMRIS). The objective of the project is to control Aquatic Nuisance Species (ANS) transfer upstream from the Mississippi River basins to the Great Lakes. Structural control methods considered for implementation at this site may include a GLMRIS Lock, electric barriers, ANS treatments, and physical barriers.

The Department is concerned about potential negative impacts to uses and users of the Chicago Area Waterway System (CAWS) as identified in the GLMRIS Report. Of special interest to the Department is the ability of watercraft to navigate through the proposed project without unnecessary delay or exposure to risks. Other potential concerns worth investigating are the risks to workers during project construction and staff during project operation. Short and long-term exposures to specific aspects of the project, such as CO₂ infused zones, should be studied. The best alternatives and mitigation should be chosen to prevent negative impacts to uses and users at the Brandon Road project site.

As you are likely aware, the Department has been reviewing a proposed hydropower facility by Northern Illinois Hydropower (NIH), LLC at the Brandon Road Lock and Dam since 2009 (FERC # 12717). The Department is interested in how the proposed GLMRIS project will affect this proposal and if the hydropower project may still be developed in cooperation between NIH and USACE. If so, the cumulative environmental impacts of both hydropower operation and the GLMRIS project at the Brandon Road site should be studied.

Another significant concern of the Department is potential negative impacts on the ability of native aquatic organisms to traverse the proposed project at this location and continue to facilitate the ecological recovery of the Upper Des Plaines River (UDPR, upstream of Brandon Lock and Dam) and CAWS that has been observed in recent decades. The following concerns are validated with survey data and published reports collected from our Fisheries Division, Impact Assessment Section, and freshwater mussel experts with the Illinois Natural History Survey serving an

advisory role to the Department. The Department requests this information be evaluated in the environmental impact statement (EIS) with alternatives and mitigation measures identified that best address these issues.

Native Fishes:

- The primary targets for the GLMRIS – Brandon Road project are Bighead and Silver carps. While it is widely agreed that preventing upstream movement of these species into the Great Lakes Basin is an important goal, curtailing movement of these ANS fish species will also impact movement of desirable native fish species.
- Connectivity within river systems is critical to maintaining and/or restoring sustainable fisheries and native fish diversity. This is particularly true in systems such as the UDPR and the CAWS, which have experienced a long history of water quality degradation. While water quality problems remain and habitat is limited in many areas of the CAWS, conditions have improved markedly over the past 40 years, prompting review of water quality regulations and use attainment goals. On the UDPR there are many areas which retain natural habitat features and where improved water quality has resulted in restoration of sustainable sport fisheries and an increase in fish species richness. The recruitment source for many of the “new” species in the UDPR appears to be the Lower Des Plaines and Illinois rivers. The improvements in water quality in the CAWS and UDPR have stimulated expanded public investment in ecosystem improvements.
- In 1975 there were very few fish of any species present in the many areas of the CAWS, including the Chicago Sanitary and Ship Canal (CSSC; MWRD 1998). In 2012, there were 26 fish species collected in the CSSC during Asian carp monitoring efforts (Asian Carp MRWG 2013). Similar improvements have been observed in most areas of the CAWS. Recruitment sources for new fish species in the CAWS include: refugia within the system, Lake Michigan, and the lower Des Plaines/Illinois River. Among these sources, the lower Des Plaines/Illinois River has the most diverse assemblage of native riverine fish species.
- Since 1983, fish species richness and sport fish abundances have increased in the UDPR (upstream of Brandon Road Lock and Dam) in response to improved water quality conditions. Temporal changes in fish assemblages in the UDPR have been documented in fish surveys conducted by IDNR. A total of 100 fish collections were conducted at 24 locations from 1974 to 2014 (See Appendices, Table 1; Figure 1). Basin Surveys conducted in 1983, 1997, 2003, 2008, and 2013 comprise the majority of the collection data. Very few surveys were done prior to 1983, or between 1983 and 1997. Results of 1983 Des Plaines River Basin Survey are found in Bertrand (1984), and Pescitelli and Rung (2005, 2010).
- Seven of 15 stations sampled in the 1983 Basin Survey were resampled in 1997, 2003, 2008 and 2013. In 1983, these seven locations yielded 21 native fish species in 300 minutes of AC-electrofishing, an average of nine species per station. The AC-electrofishing surveys conducted at the same seven locations in 1997 with similar effort (323 minutes) yielded 37 native fish species for a mean of 16 species per location (Table 2). The number of fish species per station was similar for these seven stations in the subsequent surveys 2003 to 2013;

however, overall species richness has continued to increase over the period from 1997 to 2013 (Table 2).

- For all 15 UDPR stations sampled by electrofishing and seining in 1983 there were 28 native fish species collected, including only one intolerant species- a single smallmouth bass collected at the Wisconsin State Line (Appendices, Table 3). No channel catfish were collected in the entire survey, and white sucker was the only sucker species found (Table 2). Twelve additional species were found in 1997 at only seven mainstem sampling stations. Additional new fish species were found in subsequent Basin Survey surveys (Table 3). The 2013 collection included five intolerant fish species, 86 channel catfish and three sucker species. For all surveys combined, 61 native species have been collected.
- Until 2012, the Hofmann Dam located at River Mile 44.5 (Des Plaines River) at Riverside presented a barrier to upstream fish movement. Species appearing since 1983 upstream of the dam would have likely come from refugia within the watershed, for example tributary streams within Illinois or from the Wisconsin portion of the river system. Tributary stations upstream of Hofmann Dam in 1983 included several fish species which appeared in the mainstem in more recent surveys (hornyhead chub, bigmouth shiner, central stoneroller, Johnny darter, and blackside darter; Table 4).
- Over the Basin Survey sampling period from 1997 to 2008, prior to removal of the Hofmann Dam, a number of large-bodied riverine species which were not observed in 1983 were found in the UDPR downstream of the Hoffman Dam, including: quillback, river carpsucker, silver redhorse, smallmouth buffalo, freshwater drum, and flathead catfish. The USFWS also recently collected bigmouth buffalo and black buffalo downstream of the Hofmann Dam (Asian Carp Monitoring Report 2014). Longnose gar, an additional “new” fish species, was captured in the area downstream of the former Hofmann Dam (Table 3; this species was also collected by USFWS, Asian Carp MRWG 2014).
- These large-bodied riverine species are relatively vulnerable to capture by electrofishing, therefore it is unlikely they originated from refugia within the UDPR, since they were absent in the 1983 Basin Survey at 15 locations. The most likely source for these species is the Lower Des Plaines/Illinois River populations where these species are present and common (Asian Carp Monitoring Report 2014). The migration route from the Lower Des Plaines River to the UDPR is through the Brandon Lock. The only other potential recruitment source for large-bodied riverine species is via downstream movement through CSSC (Asian Carp Monitoring Area A), where their presence is rare or undocumented (Asian Carp MRWG 2014). However, the pathway from Lake Michigan through the CAWS appears to be the source for the non-native fish species round goby, and the native species banded killifish (state-threatened), which is becoming more widespread throughout the system in recent years and seems to be advancing downstream in the Illinois River.
- In addition to potential movement of the large-bodied migrants, the appearance of several minnow species downstream of the Hoffman Dam suggests that the Brandon Lock may be used by smaller-bodied fishes as well. In particular, the appearance of rosyface shiner in 2013 indicates potential upstream movement into the UDPR. This species is listed as intolerant by

Illinois EPA and is typically found only in higher quality stream systems. Prior to 2013, there were no records for this species anywhere in the UDPR Watershed upstream of the Brandon Lock (Smogor 2004). Since 2013, rosyface shiner has also been found seven miles upstream of the former Hofmann Dam at Irving Park Road (G-30). Three other fish species found only downstream of Hofmann Dam - suckermouth minnow, striped shiner, and grass pickerel, are potential small-bodied migrants from the Lower Des Plaines River. Longear sunfish were documented for the first time in the UDPR in 2012 (Asian Carp MRWG 2013). The freckled madtom was discovered in the lower Des Plaines River near the confluence with the CSSC in 2005. This fish had not been collected in the Chicago region in 100 years. The most likely source population for this fish is 22 miles downstream, below the Brandon Road Lock and Dam. (Willink *et al.* 2006)

- There are only two tributaries to the Des Plaines River between the former Hofmann Dam and Brandon Lock, Flagg and Sawmill Creeks. In the 1983 Basin Survey, only seven species were collected from these tributaries, suggesting that Flagg and Sawmill Creeks did not serve as refugia for recently documented small-bodied species in the downstream area of UDPR (Table 5).
- In addition to the five Des Plaines River Basin Surveys conducted from 1983 to 2013, samples were collected during intervening years at selected stations. One location at Riverside (G-39, 32 miles upstream of the Brandon Road Dam) was sampled routinely during the period from 1997 to 2013 as part of the Hoffman Dam removal evaluation. This site was also sampled during the 1983 Basin Survey. Results at this location show an increase in species richness over time, similar to the results found for the basin surveys, with more frequent sampling events (Table 6). Another very likely migrant from the Lower Des Plaines River - skipjack herring, was found at this UDPR location in 2001.
- Bertrand (1984) described the Des Plaines River sport fishery as “insufficient to support even moderate angler use” based on the 1983 Basin Survey. Since the early 1990’s, selected areas of the UDPR have become heavily used for sport fishing. The IDNR Fisheries Division has worked closely with local angler groups since 1995 to establish species harvest regulations, develop a successful sauger stocking program, reintroduce native aquatic plants, and remove dams to restore connectivity and riverine habitat. Electrofishing data indicates healthy populations for multiple fish species. For example, a survey conducted in 2014 downstream of the former Hofmann Dam site in Riverside yielded 25 native species and a diverse sport fishery including 10 walleye (15-20”), 10 sauger (three year classes, 8-17”), 15 smallmouth bass, 42 largemouth bass, seven northern pike, 25 channel catfish, and seven rock bass.
- Improvements in the sport fishery and in native fish species diversity observed for the UDPR in the past 40 years demonstrate the resiliency of fish and aquatic systems. However, an important component of the restoration equation is connection to diverse downstream recruitment sources. The sportfishery appears to have recovered to sustainable levels and can be supplemented by stocking. Although native fish species richness has increased and some species have become established, many others are represented by very few individuals. Even

in un-modified, natural stream systems, local extirpations can occur due to natural perturbations (eg. flood and drought). In urban streams, this risk is greater due to modified flow regimes and there is an increased potential for pollution caused fish kills.

- The UDPR will likely continue to rely on a downstream connection to the Lower Des Plaines/Illinois River to maintain and expand current fish assemblages. Moreover, there are additional species present in the lower Des Plaines River which would be potential candidates for migration into the UDPR through the Brandon Lock, most notably, the redhorse species. Silver redhorse has been collected in the UDPR, represented by only two individuals to date. All five redhorse species occur in the lower Des Plaines and Illinois Rivers, including the Illinois State listed species, river and greater redhorse.
- In addition, a significant amount of restoration effort has been implemented to improve the UDPR. The IDNR and the Army Corps of Engineers completed an Ecosystem Restoration project on the Des Plaines River in 2012 which included the removal of the Hofmann Dam and two other dams (Armitage Avenue and Fairbanks Road). Lake County removed the Ryerson Dam in 2011. During 2014, Dam #1 and Dam #2 were removed as a part of IL DNR Dam Removal Initiative. The five remaining dams on the Des Plaines River are currently in the design phase for removal. After completion of the Dam Removal Initiative work, the Des Plaines River will be free flowing from the Wisconsin State Line to Brandon Road.
- Injuries and mortality of fishes occur at pumping stations, dams, and other man-made structures in rivers due to impingement on trashracks and screens, entrainment into pumps and pipes, and barotrauma during sudden pressure changes. An analysis should be completed on injury and mortality rates of fishes from equipment installed at the project site that is capable of causing these issues. The study should consider all species potentially occurring at the project site, different size classes, and loss of fish hosting mussel larvae (called glochidia). The best alternatives and mitigation measures should be chosen to address these concerns.

Native Mussels:

- Freshwater mussels have a complex and unique reproductive cycle (Williams *et al.* 1993). The glochidia need fish to transform and complete the mussel life cycle. Some mussel species can use several species of fish as hosts, whereas others require a particular species or family of fish. Therefore, the freshwater mussel assemblage can be tightly correlated with the fish assemblage.
- Freshwater mussels are the most imperiled group of organisms in North America. Nearly 75% of the approximately 300 North American mussel taxa are extinct, federally-listed as endangered or threatened, or in need of conservation status (Williams *et al.* 1993). In Illinois, 25 of the 62 extant species (44%) are listed as threatened or endangered (Illinois Endangered Species Protection Board 2011). Impoundments are major factors affecting freshwater mussel populations (Vaughn and Taylor 1999; Watters 2000; Tiemann et al 2007b).

- Dams not only change physicochemical parameters (e.g., modified flow patterns and increased sedimentation), but also alter host fish assemblages and restrict host fish movement (Tiemann et al. 2004; Santucci et al. 2005; Slawski et al. 2008). The resulting effects for mussels include restricted distributions, blockage of gene flow, fragmented and declining populations, and altered community composition (Vaughn and Taylor 1999; Watters 1996; Tiemann et al 2007b). These effects occur upstream and downstream of impoundments, and are exacerbated by the presence of multiple impoundments or impoundments on tributaries (Watters 1996; Tiemann et al 2007b). Also, a dam near the river's mouth can hinder the (re)colonization of mussels into a basin because the dam prohibits the dispersal of host fishes.
- The Des Plaines River basin historically supported 38 species of freshwater mussels, but only 13 species have been found alive since 1969 (Tiemann et al. 2007a; Price et al. 2012a). The Kankakee River historically supported 40 species and 30 are still considered extant (Tiemann et al. 2007a; Price et al. 2012b). The upper Illinois River, long considered a wasteland and devoid of freshwater mussels (Starrett 1971), is recovering and now has 24 species inhabiting its waters (Sietman et al. 2001; INHS Mollusk Collection database, Champaign). The species from the lower Kankakee and upper Illinois River, which include the federally-endangered scaleshell (*Leptoda leptodon*), the federally-endangered sheepnose (*Plethobasus cyphus*), the state-threatened purple wartyback (*Cyclonaias tuberculata*), and the state-threatened black sandshell (*Ligumia recta*), likely will not have the opportunity to recolonize the Des Plaines River and CAWS if their host fishes are not able to pass through the proposed project at Brandon Road Lock and Dam.

State-Threatened, Endangered, and Species Proposed for Listing:

- Numerous state-listed species, and species proposed for listing, are known to occur in the upper Illinois River, lower Kankakee River, and CAWS that may be negatively impacted by the proposed GLMRIS project at Brandon Road Lock and Dam. A list of these species is included in Table 7. Impediments in the river systems will cause challenges for successful recovery of these species in the state. Some of these species, such as the state-listed greater and river redhorses as described on Page 5, are known to occur downstream of the Brandon Road lock and Dam and possible range expansion upstream into the CAWS would be eliminated with project implementation. An investigation of the effects of the proposed project on recovery of these species in their historic ranges in Illinois should be completed. The study should include an estimate of the number of individuals expected to be lost due to mortality when the proposed facility is encountered. The best alternatives and mitigation measures should be chosen to address these concerns.
- American eel population declines are mostly attributed to dams and other river obstacles preventing access to habitats and migration routes. Many projects, such as hydropower development, have included eel ladders in design plans to provide a safe route for eel's to traverse barriers (U.S. Fish and Wildlife Service 2011). American eels are observed on occasion in the Illinois River and CAWS river systems. For example, an individual was caught recently (2014) by a fisherman in Tampier Lake, Cook County. It is suspected this fish likely migrated to this location from the Mississippi River basin or possibly from the Great Lakes basin. Pending publication in the Illinois Register, the American eel will be listed as a

state-threatened species. Project design should consider installing safe passage specific to the American eel at this location.

Gene Flow, Migration, and Range Shifts:

- Construction of the proposed project may cause fish and mussel populations to become disjunct in the CAWS and Illinois River basin with restricted gene flow. Gene flow and genetic variability is important to the well-being and future existence of a species, and perhaps even more so in modern times with anthropogenic climate change likely driving evolutionary responses (Parmesan 2006; Crozier and Hutchings 2014). The effects of the proposed project on gene flow should be investigated not only for state-listed fish and mussel species, but also ecologically and economically important aquatic species as well. The best alternatives and mitigation measures should be chosen to address this issue.
- Interference of migration and species range shifts as they respond to climate change is another issue that should be investigated. Many studies in recent years have documented range shifts attributed to climate change in freshwater, marine, and terrestrial ecosystems as species pursue optimal abiotic and biotic resource availability (Walther et al. 2002; Parmesan 2006). While range shifts may be difficult to predict for individual species, the ability of individuals to track optimal environmental conditions will increase in importance, and obstructions in travel corridors will pose significant challenges to future conservation strategies (Pearson and Dawson 2005). The effects the proposed project will have on range shifts of aquatic species in response to climate change should be investigated and the best alternatives and mitigation chosen to address these concerns.

Thank you for the opportunity to provide comments on the proposed GLMRIS project at Brandon Road Lock and Dam. Please contact Steve Pescitelli, Kevin Irons, or myself if you have further questions regarding these comments.



Nathan Grider
Impact Assessment Section
217-785-5500

cc: Steve Pescitelli – IDNR, Fisheries
Kevin Irons – IDNR, Fisheries
Jeremy Tiemann – INHS, Field Biologist
Shawn Cirton – USFWS, Chicago Illinois Field Office
Peter Bullock – USACE, Chicago District
Frank Veraldi - USACE, Chicago District

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Appendices

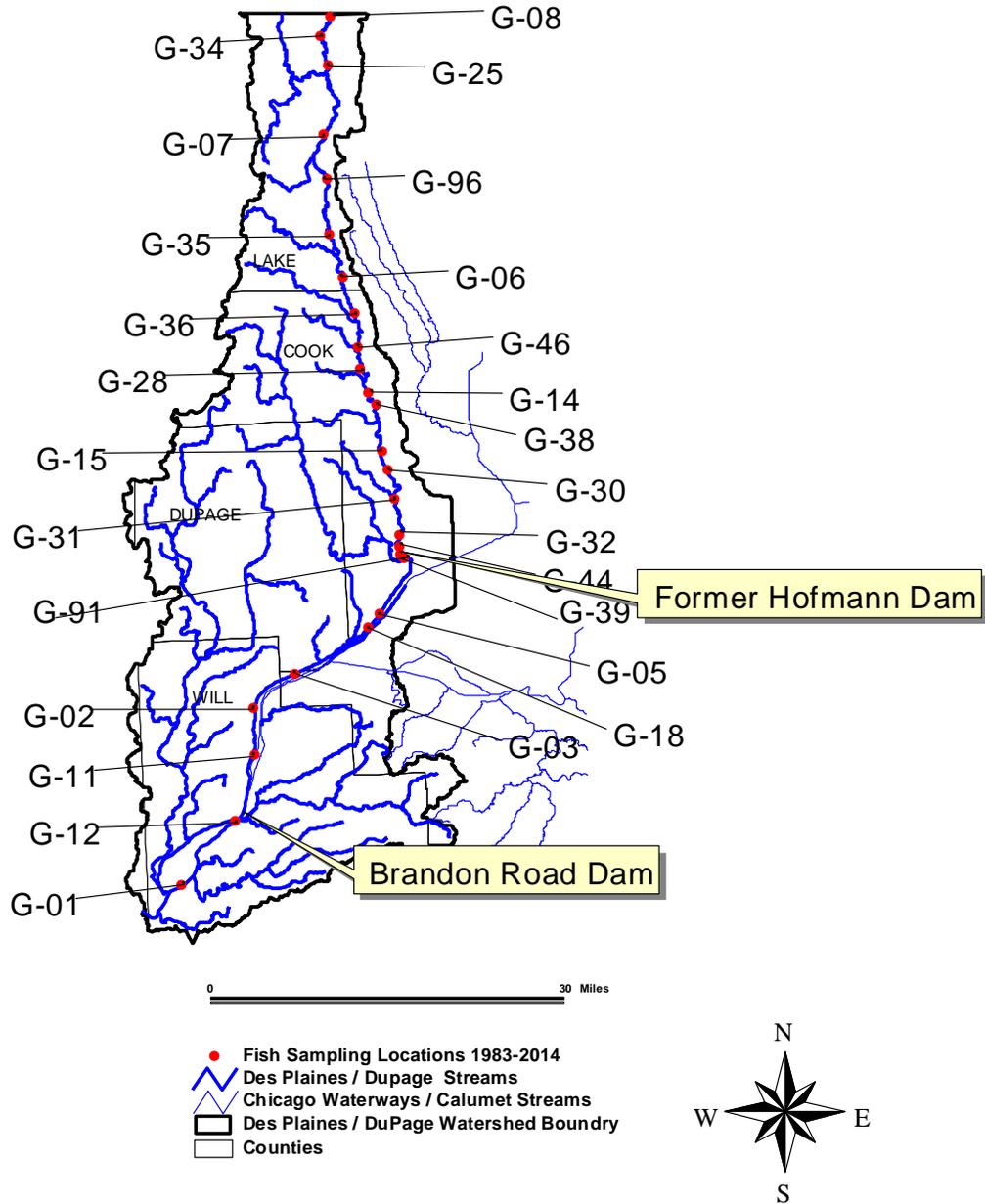


Figure 1. Location of Illinois Department of Natural Resources fish sampling locations on the mainstem of the Des Plaines River, 1983 - 2014.

Table 1. Illinois Department of Natural Resources sampling locations on the mainstem of the Des Plaines River, 1979-2014.

Location	IEPA CODE	1979	1980	1982	1983	1985	1987	1989	1990	1991	1993	1995	1997	1998	1999	2000	2001	2002	2003	2004	2005	2007	2008	2010	2012	2013	2014	Total No. Stations
Russel Rd	G-08	X	X	X	X	X	X	X			X		X						X				X		X			12
Rt. 173	G-34				X																							1
Wadsworth Rd	G-25				X				X	X			X						X				X		X			7
Rt 120 Belvidere Rd	G-07				X							X	X						X				X		X			6
Oak Springs Rd	G-96				X																				X			2
Danl Wright Woods	G-35				X								X						X				X		X			5
Deerfield Road - Ryerson	G-06																		X						X			2
Dam #1 Dwnstrm	G-36				X																				X			2
DAM #2 Dwnstrm	G-46																		X									1
Golf Rd	G-28				X								X															2
Oakton St US Touhy	G-14																		X						X			2
Touhy Ave	G-38																		X						X			2
Irving Park Rd	G-15																X		X						X	X		4
Grand Ave (Armitage)	G-30				X														X						X	X		4
Chicago Ave	G-31																							X				1
Cermak Rd	G-32				X																							1
Forest Ave US Hofmann	G-44											X		X			X								X	X		5
Upstream Hofmann Salt Ck	G-91																		X								X	2
Swan Pond DS Hoff.	G-39				X								X	X	X	X	X		X	X	X	X	X	X		X	X	14
Sante Fe Prairie Rt. 45	G-05																	X	X	X								3
Wentworth Ave Willow Spgs	G-18				X								X						X			X	X		X			6
Lemont Rd	G-03				X																		X		X			3
135th St Romeoville	G-02																				X		X		X			3
Division St. Lockport	G-11				X								X						X				X		X			5
DS Brandon Rd. Dam	G-12				X																		X		X			3
I-55 Bridge	G-01																						X		X			2
Total No. Stations		1	1	1	15	1	1	1	1	1	1	2	8	2	1	1	3	1	15	2	2	2	11	2	1	19	4	100

Table 2. Mean number of species collected and mean electrofishing (EF) period at common stations sampled in all IDNR Basin Surveys, 1983 - 2013

	1983	1997	2003	2008	2013
No. Stations	7	7	7	7	7
Mean No. Fish Species/Station	8	16	16	15	18
Mean EF Period (min.)	46	44	53	57	56

Table 3. Native fish species collected at all locations for each IDNR Basin Survey on the mainstem of the Des Plaines River.

Common name	Scientific name	1983	1997	2003	2008	2013
Bowfin	<i>Amia calva</i>	X	X	X	X	X
Gizzard shad	<i>Dorosoma cepedianum</i>	X	X	X	X	X
Central mudminnow	<i>Umbra limi</i>	X	X		X	
Northern pike	<i>Esox lucius</i>	X	X	X	X	X
Golden shiner	<i>Notemigonus crysoleucas</i>	X	X	X	X	X
Creek chub	<i>Semotilus atromaculatus</i>	X	X	X	X	X
Common shiner	<i>Luxilus cornutus</i>	X	X	X		
Spotfin shiner	<i>Cyprinella spiloptera</i>	X	X	X	X	X
Red shiner*	<i>Cyprinella lutrensis</i>	X				
Fathead minnow	<i>Pimephales promelas</i>	X	X	X	X	X
Bluntnose minnow	<i>Pimephales notatus</i>	X	X	X	X	X
Emerald shiner	<i>Notropis atherinoides</i>	X	X	X	X	X
Sand shiner	<i>Notropis ludibundus</i>	X	X	X	X	X
White sucker	<i>Catostomus commersoni</i>	X	X	X	X	X
Yellow bullhead	<i>Ameiurus natalis</i>	X	X	X	X	X
Black bullhead	<i>Ameiurus melas</i>	X	X	X	X	X
Blackstripe topminnow	<i>Fundulus notatus</i>	X	X	X	X	X
Black crappie	<i>Pomoxis nigromaculatus</i>	X	X	X	X	X
White crappie	<i>Pomoxis annularis</i>	X		X	X	
Rock bass	<i>Ambloplites rupestris</i>	X	X	X	X	X
Largemouth bass	<i>Micropterus salmoides</i>	X	X	X	X	X
Smallmouth bass	<i>Micropterus dolomieu</i>	X	X	X	X	X
Green sunfish	<i>Lepomis cyanellus</i>	X	X	X	X	X
Bluegill	<i>Lepomis macrochirus</i>	X	X	X	X	X
Pumpkinseed	<i>Lepomis gibbosus</i>	X	X	X	X	X
Yellow perch	<i>Perca flavescens</i>	X		X	X	X
Blackside darter	<i>Percina maculata</i>	X	X	X	X	X
Johnny darter	<i>Etheostoma nigrum</i>	X	X	X	X	X
Hornyhead chub	<i>Nocomis biguttatus</i>		X	X	X	X
Bigmouth shiner	<i>Notropis dorsalis</i>		X	X	X	X
Quillback*	<i>Carpionodes cyprinus</i>		X	X	X	X
Spotted sucker	<i>Minytrema melanops</i>		X	X	X	X
Silver redhorse*	<i>Moxostoma anisurum</i>		X			
Channel catfish	<i>Ictalurus punctatus</i>		X	X	X	X
Tadpole madtom	<i>Noturus gyrinus</i>		X	X	X	X
Brook silverside	<i>Labidesthes sicculus</i>		X			X
Yellow bass	<i>Morone mississippiensis</i>		X		X	X
Orangespotted sunfish	<i>Lepomis humilis</i>		X	X	X	X
Walleye	<i>Stizostedion vitreum</i>		X	X	X	X
Freshwater drum*	<i>Aplodinotus grunniens</i>		X	X	X	X
Central stoneroller	<i>Campostoma anomalum</i>			X	X	
Redfin shiner	<i>Lythrurus umbratilis</i>			X		
Blackchin shiner	<i>Notropis heterodon</i>			X		
Mimic shiner	<i>Notropis volucellus</i>			X		
Spottail shiner	<i>Notropis hudsonius</i>			X	X	X
Smallmouth buffalo*	<i>Ictiobus bubalus</i>			X	X	X
Stonecat	<i>Noturus flavus</i>			X	X	X
Mosquitofish	<i>Gambusia affinis</i>			X	X	X
Warmouth	<i>Lepomis gulosus</i>			X	X	X
Sauger	<i>Stizostedion canadense</i>			X	X	X
Striped shiner*	<i>Luxilus chrysocephalus</i>				X	
River carpsucker*	<i>Carpionodes carpio</i>				X	X
Flathead catfish*	<i>Pylodictis olivaris</i>				X	
Logperch	<i>Percina caprodes</i>				X	X
Longnose gar*	<i>Lepisosteus osseus</i>					X
Grass pickerel*	<i>Esox americanus</i>					X
Muskellunge	<i>Esox masquinongy</i>					X
Suckermouth minnow*	<i>Phenacobius mirabilis</i>					X
Rosyface shiner**	<i>Notropis rubellus</i>					X
Banded killifish*	<i>Fundulus diaphanus</i>					X
Redear sunfish	<i>Lepomis microlophus</i>					X
	Total Native Species	28	37	45	47	50
	Cummulative Species Total	28	40	50	54	61
	No. Stations	15	8	19	8	17

*collected only downstream of former Hofmann Dam

Table 4. Fish species found in Des Plaines River tributaries, upstream of the Hofmann Dam in 1983. Streams include Mill Creek, Indian Creek, Bull Creek, Willow Creek, Salt Creek, and Addison Creek.

Common name	Scientific name
Goldfish	<i>Carassius auratus</i>
Carp	<i>Cyprinus carpio</i>
Golden shiner	<i>Notemigonus crysoleucas</i>
Creek chub	<i>Semotilus atromaculatus</i>
Hornyhead chub	<i>Nocomis biguttatus</i>
Unidentified Stoneroller	<i>Campostoma</i> sp.
Common shiner	<i>Luxilius cornutus</i>
Spotfin shiner	<i>Cyprinella spiloptera</i>
Fathead minnow	<i>Pimephales promelas</i>
Bluntnose minnow	<i>Pimephales notatus</i>
White sucker	<i>Catostomus commersoni</i>
Brown bullhead	<i>Ameiurus nebulosus</i>
Stonecat	<i>Noturus flavus</i>
Blackstripe topminnow	<i>Fundulus notatus</i>
Brook silverside	<i>Labidesthes sicculus</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Largemouth bass	<i>Micropterus salmoides</i>
Green sunfish	<i>Lepomis cyanellus</i>
Bluegill	<i>Lepomis macrochirus</i>
Pumpkinseed	<i>Lepomis gibbosus</i>
Blackside darter	<i>Percina maculata</i>
Johnny darter	<i>Etheostoma nigrum</i>
Fantail darter	<i>Etheostoma flabellare</i>

Table 5. Fish species found in Des Plaines River tributaries, downstream of Hofmann Dam in 1983. Streams include Flagg Creek and Sawmill Creek.

Common name	Scientific name
Golden shiner	<i>Notemigonus crysoleucas</i>
Creek chub	<i>Semotilus atromaculatus</i>
Fathead minnow	<i>Pimephales promelas</i>
White sucker	<i>Catostomus commersoni</i>
Largemouth bass	<i>Micropterus salmoides</i>
Green sunfish	<i>Lepomis cyanellus</i>
Bluegill	<i>Lepomis macrochirus</i>

Table 6. ILDNR sampling results downstream of the former Hofmann Dam (Removed 2012) at Station G-39 on the Des Plaines River mainstem, 32 miles upstream of Brandon Lock, 1983 - 2014.

Common name	Scientific name	1983	1996	1997	1998	1998	1999	2000	2001	2003	2005	2008	2010	2013	2014
Black bullhead	Ameiurus melas	X			X	X									
Black crappie	Pomoxis nigromaculatus	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bluegill	Lepomis macrochirus	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bluntnose minnow	Pimephales notatus	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Carp	Cyprinus carpio	X	X	X	X	X	X	X	X	X	X	X	X		X
Creek chub	Semotilus atromaculatus	X		X										X	X
Gizzard shad	Dorosoma cepedianum	X	X	X	X	X	X		X	X	X	X	X	X	X
Goldfish	Carassius auratus	X	X	X	X	X	X			X		X	X		X
Green sunfish	Lepomis cyanellus	X	X	X	X	X	X	X		X	X	X	X	X	X
Largemouth bass	Micropterus salmoides	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Pumpkinseed	Lepomis gibbosus	X	X		X	X	X			X					X
Red shiner	Cyprinella lutrensis	X													
White sucker	Catostomus commersoni	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bowfin	Amia calva		X	X							X	X			X
Channel catfish	Ictalurus punctatus		X	X	X	X	X	X	X	X	X	X	X	X	X
Golden shiner	Notemigonus crysoleucas		X	X			X		X			X			
Orangespotted sunfish	Lepomis humilis	X	X	X	X	X	X	X		X	X	X	X	X	
Sand shiner	Notropis ludibundus		X	X	X	X	X	X	X	X	X	X	X	X	X
Smallmouth bass	Micropterus dolomieu		X	X	X	X	X	X	X	X				X	X
Smallmouth buffalo	Ictiobus bubalus		X								X				X
Spotfin shiner	Cyprinella spiloptera	X	X			X	X	X	X	X	X	X	X	X	X
Walleye	Stizostedion vitreum		X	X		X	X	X	X	X	X	X	X		X
Bigmouth shiner	Notropis dorsalis			X	X	X	X			X		X		X	
Fathead minnow	Pimephales promelas			X			X					X		X	
Northern pike	Esox lucius		X	X	X	X	X	X	X	X	X	X		X	X
Silver redhorse	Moxostoma anisurum			X											X
Yellow bass	Morone mississippiensis				X	X	X								
Yellow bullhead	Ameiurus natalis				X	X	X			X		X	X		
Emerald shiner	Notropis atherinoides						X				X				
Rock bass	Ambloplites rupestris						X			X	X	X	X	X	X
Spottail shiner	Notropis hudsonius						X		X	X	X				X
White crappie	Pomoxis annularis						X					X			
Yellow perch	Perca flavescens						X				X				
Spotted sucker	Minytrema melanops							X	X				X		X
Tadpole madtom	Noturus gyrinus							X	X						
Johnny darter	Etheostoma nigrum							X	X	X		X		X	
Sauger	Stizostedion canadense								X	X	X	X	X		X
Skipjack herring	Alosa chrysochloris								X						
Suckermouth minnow	Phenacobius mirabilis								X					X	
Blackstripe topminnow	Fundulus notatus									X		X		X	
Common shiner	Luxilus cornutus									X					
Freshwater drum	Aplodinotus grunniens									X		X			X
Hornyhead chub	Nocomis biguttatus									X	X	X	X	X	X
Blackside darter	Percina maculata										X				
Striped shiner	Luxilus chrysocephalus										X	X			
Round goby	Neogobius melanostomus											X	X	X	X
Loggerhead	Percina caprodes													X	
Mosquitofish	Gambusia affinis													X	
Quillback	Carpiodes cyprinus													X	
River carsucker	Carpiodes carpio													X	X
Rosyface shiner	Notropis rubellus													X	X
	Native Fish Species	11	17	20	17	18	25	16	20	25	23	26	17	26	26
	Cummulative Species Total	11	20	24	26	26	31	34	37	41	43	43	43	49	49
	Electrofishing minutes	30	38	60	30	60	60	50	30	53	60	60	60	60	45

Table 7: List of state-threatened, endangered and species proposed for listing which may be negatively impacted by implementation of the proposed GLMRIS project at Bandon Road Lock and Dam.

Common Name	Scientific Name	State Status
American eel	<i>Anguilla rostrata</i>	Proposed as threatened
American brook lampray	<i>Lethenteron appendix</i>	Proposed as threatened
Banded killifish	<i>Fundulus diaphanus</i>	Threatened
Black sandshell	<i>Ligumia recta</i>	Threatened
Blacknose shiner	<i>Notropis heterolepis</i>	Endangered
Brassy minnow	<i>Hybognathus hankinsoni</i>	Proposed as threatened
Greater redhorse	<i>Moxostoma valenciennesi</i>	Endangered
Iowa Darter	<i>Etheostoma exile</i>	Threatened
Longnose sucker	<i>Catostomus catostomus</i>	Threatened
Mudpuppy	<i>Necturus maculosus</i>	Threatened
Purple wartyback	<i>Cyclonaias tuberculata</i>	Threatened
River redhorse	<i>Moxostoma carinatum</i>	Threatened
Pallid shiner	<i>Hybopsis amnis</i>	Endangered
*Scaleshell	<i>Leptoda leptodon</i>	Proposed as endangered
*Sheepnose	<i>Plethobasus cyphyus</i>	Endangered

*Federally listed species