November 20, 2012

Mr. Joseph Kath
Endangered Species Manager
Illinois Department of Natural Resources
Division of Natural Heritage
One Natural Resources Way
Springfield, IL 62702-1271

RE: **Conservation Plan Transmittal**

Dear Mr. Kath,

This letter is to serve as the transmittal for the Tollway's black sandshell mussel Conservation Plan. Per your request, please find included a copy of the signed Conservation Plan that was developed by Huff and Huff Inc.

Please feel free to contact me at (630) 241-6800 extension 3872, if you have any questions or would like additional copies.

Sincerely,

Bryan Wagner,
Senior Environmental Planner

Enclosures

cc: Alycia Kluenenberg, Huff & Huff, Inc.

Illinois Department of Natural Resources

Office of Resource Conservation

Conservation Plan for the Incidental Taking of the State Threatened Species Black Sandshell (*Ligumia recta*) Mussel Near the Interstate-90 Bridge, Kishwaukee River

Applicant: Illinois State Tollway Highway Authority

October, 2012

1. Description of Project Impact

The Illinois State threatened species, the black sandshell mussel (*Ligumia recta*) is known to be in the immediate vicinity of the Interstate 90 (I-90) bridge at the Kishwaukee River, Winnebago County, Illinois. An Incidental Take Authorization (ITA) for the black sandshell is requested by the Illinois State Toll Highway Authority (Tollway), to pursue bridge reconstruction at the I-90 bridge over the Kishwaukee River. A plan to minimize impacts to the black sandshell population in the area is proposed under provisions of the ITA.

A) Description of the area to be affected:

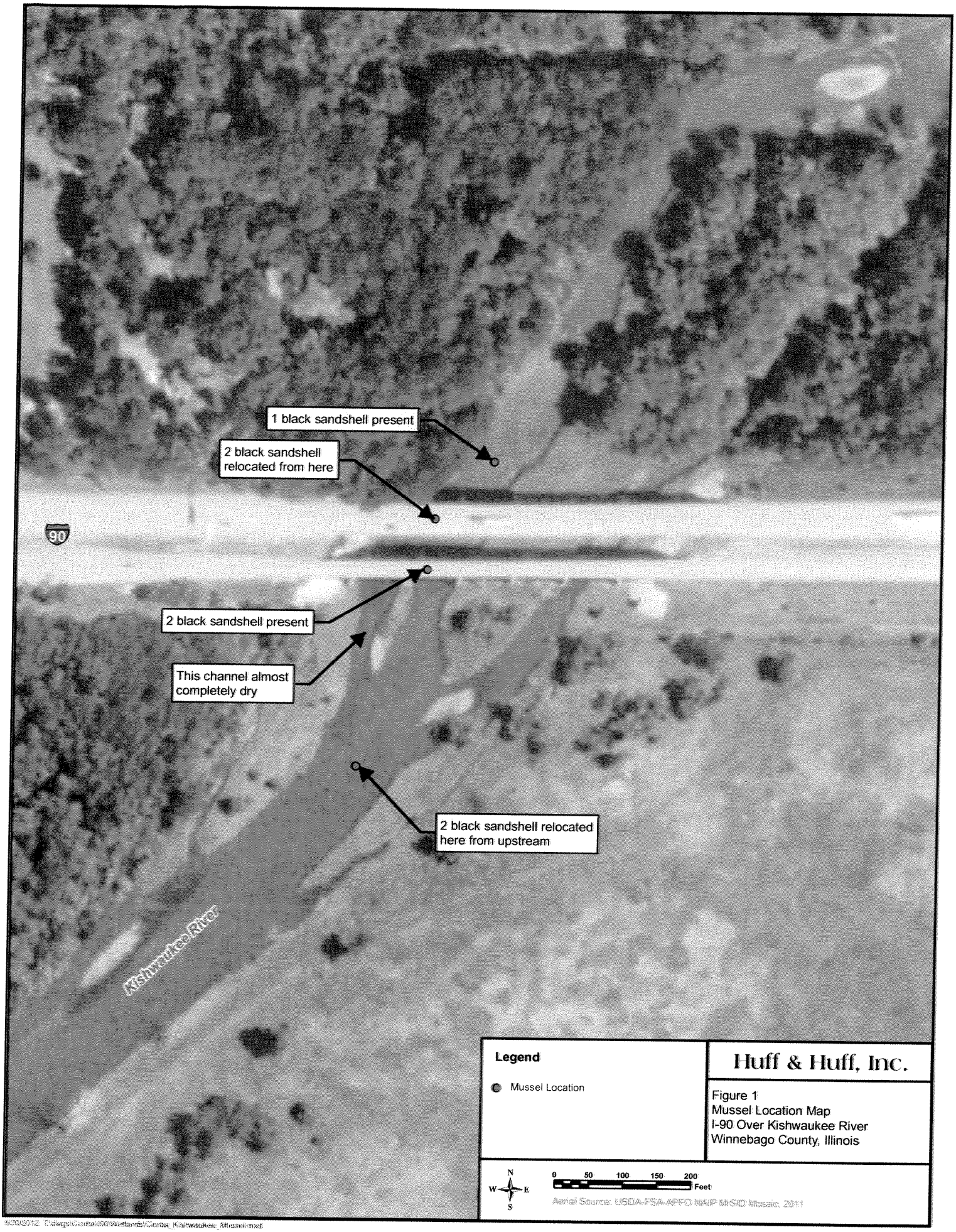
The Tollway is proposing bridge reconstruction for the I-90 bridge crossing over the Kishwaukee River in Winnebago County, Illinois near Cherry Valley. The I-90 bridge project will be adding an extra traffic lane in both directions. Bridge reconstruction will require new bridge piers located both in the Kishwaukee River and on an existing island in the Kishwaukee River. The center point of the project location has coordinates in decimal degrees at 42.247189°N, 88.943553°W. The Township Range and Section for the project are T 44N, R2E, S36, 3rd Principal Meridian.

The construction operations within the Kishwaukee River will include the placement of temporary causeways and cofferdams as required to facilitate the removal of the existing piers and placement of the proposed piers, as well as the removal of existing and placement of new slope walls. The eastbound bridge will be constructed first, followed by the westbound bridge. The temporary causeways and cofferdams will be removed upon the completion of each bridge project and the stream will be restored.

The causeways will presumably be constructed using excavators or similar heavy equipment to place the clean crushed stone/rip rap into the river after a crane has placed the concrete blocks around the perimeter of the causeway. A sheet-pile driver will be used to drive the sheet piling for the cofferdams around the existing piers to be removed and at the proposed pier locations. Once the cofferdams are constructed, an excavator will excavate to the required footing depth and the crane will drive necessary piles at each proposed foundation location.

This construction is scheduled to begin in February 2013. Construction will commence once the weather has improved to allow for maintenance of traffic to be implemented. The duration of the construction will be approximately 20 months with intermittent stream disturbances. There will be no in-stream work between April 1 and June 30 to avoid impacts to fish during spawning season. It is important to the project schedule to perform the mussel relocation as early as possible in 2012 to take advantage of the best river conditions possible.

The Kishwaukee River flows under the existing I-90 bridge as two distinct channels, an eastern channel approximately 55 feet wide and a western channel approximately 122 feet wide. The western channel is subdivided into two approximately equal sections by existing bridge piers. The eastern and western channels are separated by an island approximately 130 feet wide and 1000 feet in length. Figure 1 presents the aerial view of the immediate area at the I-90 bridge at the Kishwaukee River.


1 black sandshell present
2 black sandshell relocated from here
90
2 black sandshell present
This channel almost completely dry
2 black sandshell relocated here from upstream
Kishwaukee River
Legend
Mussel Location
Huff & Huff, Inc.
Figure 1
Mussel Location Map
I-90 Over Kishwaukee River
Winnebago County, Illinois
N
W
E
S
0
50
100
150
200
Feet
Aerial Source: USDA-FSA-APFO NAIP MrSID Mosaic, 2011

B) Biological Data for the Black Sandshell in Illinois

The black sandshell inhabits larger streams and rivers with hard bottoms such as firm, compacted sand, sandy gravel, or gravel/cobble in fast flowing water. Despite its name, the black sandshell is rarely found in readily shifting sands and is never found in silty conditions (Parmalee and Bogan, 1998, Montana, 2012). The black sandshell can reach a length of approximately eight inches. (Cummings & Mayer 1992, Klocek et al. 2006).

Native freshwater mussels require a fish host to distribute their larvae (glochidia). Black sandshells are bradytictic, or long term brooders. Females brood their glochidial larvae from August through the winter to the following July before they are released (Ortmann 1919). Host fish for the glochidia of the black sandshell include the bluegill (*Lepomis macrochirus*), largemouth bass (*Micropterus salmoides*), sauger (*Stizostedion canadense*), and white crappie (*Pomoxis annularis*) (Watters 1994). Additionally, yellow perch (*Perca flavescens*), green sunfish (*Lepomis cyanellus*), rock bass (*Ambloplites rupestris*), and white perch (*Morone americana*) were identified as suitable hosts for black sandshell by Steg, (1998). Saugers are considered by some to be a primary host fish for black sandshell (Khym and Layzer. 2000).

Despite the relatively large number of host fish that carry larval black sandshell, the black sandshell appears to be declining throughout its midwestern range. While exact causes of black sandshell decline are not reported in the literature, general declines or extirpations in mussel populations are attributed to habitat changes and water quality changes that can be linked to pollution from siltation and urban runoff. (Downing et al. 2010). Recent findings that mussel glochidia are acutely sensitive to small ammonia spikes (USEPA, 2009), indicate that ammonia runoff from lawns, turf grass, farms, and perhaps wastewater treatment plant overflows during heavy rain events may contribute to a lack of recruitment for larval mussels.

The Illinois Natural History Survey (INHS) database contains records of black sandshell occurrences in Illinois. Recent populations of black sandshell were tallied from the INHS data, with records dated from the year 2000 through 2012 counted as recent populations. Recent reports of the black sandshell are from 20 discrete river/stream systems. Table 1 presents the INHS black sandshell distribution results for Illinois dating from 1878 to 2011.

TABLE 1
BLACK SANDSHELL DISTRIBUTION IN ILLINOIS
BY RIVER AND COUNTY

INHS #	Stream	Drainage	County	Year
INHS 26939	Apple River	Mississippi River	Jo Daviess	2001
INHS 28598	Big Rock Creek	Fox River	Kendall	2003
INHS 2958	Embarras River	Wabash River	Jasper	1986
INHS 25200	Fox River	Illinois River	Kane	2000
INHS 41437	Fox River	Illinois River	Kendall	2011
INHS 23679	Fox River	Illinois River	LaSalle	1999
INHS 9710	Fox River	Illinois River	McHenry	1957
INHS 18618	Illinois River	Mississippi River	Calhoun	1995
INHS 23878	Illinois River	Mississippi River	Grundy	1999
INHS 37083	Illinois River	Mississippi River	LaSalle	....
INHS 10012	Illinois River	Mississippi River	Mason	1990
INHS 1272	Illinois River	Mississippi River	Peoria	1878
INHS 38720	Illinois River	Mississippi River	Putnam	2010
INHS 38852	Illinois River	Mississippi River	Tazewell	2010
INHS 39955	Iroquois River	Kankakee River	Iroquois	2010
INHS 42019	Iroquois River	Kankakee River	Kankakee	2011
INHS 39180	Kankakee River	Illinois River	Kankakee	2010
INHS 36110	Kankakee River	Illinois River	Will	2009
INHS 1187	Kaskaskia River	Mississippi River	Clinton	1929
INHS 35806	Kaskaskia River	Mississippi River	Fayette	1992
INHS 236	Kaskaskia River	Mississippi River	Washington	.....
INHS 41910	Kishwaukee River	Rock River	Boone	2011
INHS 19483	Kishwaukee River	Rock River	McHenry	1996
INHS 10270	Kishwaukee River	Rock River	Winnebago	1990
INHS 13375	Kishwaukee River	Rock River	Winnebago	1991
INHS 41988	Kishwaukee River	Rock River	Winnebago	2011
INHS 39346	Mackinaw River	Illinois River	Tazewell	2010
INHS 18370	Mackinaw River	Illinois River	Woodford	1995
INHS 23913	Middle Fork Vermilion River	Wabash River	Vermilion	1999
INHS 37423	Mississippi River	Gulf of Mexico	Adams	1881
INHS 36152	Mississippi River	Gulf of Mexico	Carroll	2009
INHS 7614	Mississippi River	Gulf of Mexico	Hancock	1989
INHS 26534	Mississippi River	Gulf of Mexico	Jo Daviess	2001
INHS 37106	Mississippi River	Gulf of Mexico	Madison	1926
INHS 6768	Mississippi River	Gulf of Mexico	Mercer	1989
INHS 25622	Mississippi River	Gulf of Mexico	Pike	1999
INHS 41581	Mississippi River	Gulf of Mexico	Rock Island	2011
INHS 31906	Nippersink Creek	Fox River	McHenry	2007
INHS 31777	North Branch Nippersink Creek	Fox River	McHenry	2006
INHS 1461	Ohio River	Mississippi River	Alexander	1879
INHS 32803	Ohio River	Mississippi River	Massac	2008
INHS 32772	Ohio River	Mississippi River	Pulaski	2008
INHS 10506	Pecatonica River	Rock River	Stephenson	1990
INHS 1823	Pecatonica River	Rock River	Winnebago	1926
INHS 16965	Poplar Creek	Fox River	Cook	1993-1994
INHS 154	Quiver Creek	Illinois River	Mason	1894
INHS 35342	Rock River	Mississippi River	Lee	2009
INHS 35520	Rock River	Mississippi River	Ogle	2009

TABLE 1 (Continued)				
INHS 35369	Rock River	Mississippi River	Rock Island	2009
INHS 35391	Rock River	Mississippi River	Whiteside	2009
INHS 786	Rock River	Mississippi River	Winnebago	1926
INHS 41118	Rock River	Mississippi River	Winnebago	2011
INHS 17373	Rush Creek	Mississippi River	Jo Daviess	1994
INHS 35477	Salt Creek	Sangamon River	Mason	2009
INHS 24282	Salt Fork Vermilion River	Wabash River	Vermilion	1999
INHS 31843	Sangamon River	Illinois River	Champaign	2007
INHS 10693	Sangamon River	Illinois River	Menard	1990
INHS 7301	Sangamon River	Illinois River	Sangamon	1988
INHS 23279	S. Branch Kishwaukee River	Rock River	Winnebago	1999
INHS 34447	South Henderson Creek	Mississippi River	Henderson	2009
INHS 28918	Spoon River	Illinois River	Fulton	2004
INHS 8757	Spoon River	Illinois River	Knox	1957
INHS 40096	Spoon River	Illinois River	Peoria	2010
INHS 40119	Spoon River	Illinois River	Stark	2010
INHS 25216	Spring Creek	Fox River	Cook	1999
INHS 25405	Sugar Creek	Iroquois River-Kankakee Riv.	Iroquois	2000
INHS 35453	Sugar Creek	Salt Creek-Sangamon River	Logan	2009
INHS 28669	Sugar River	Pecatonica River-Rock River	Winnebago	2003
INHS 18684	Trib. Mid. Fork Vermilion Riv.	Wabash River	Vermilion	1996
INHS 41177	Vermilion River	Wabash River	Vermilion	2011
INHS 6365	Wabash River	Ohio River	Clark	1988
INHS 32833	Wabash River	Ohio River	Lawrence	2008
INHS 28961	Wabash River	Ohio River	Wabash	2004
INHS 4760	Wabash River	Ohio River	White	1987

Source: INHS Mollusk database accessed 6-1-2012

Black Sandshell in the Kishwaukee River

Several recent studies have confirmed black sandshell populations in the Kishwaukee River mainstem and tributaries. The IDNR undertook mussel surveys in the Kishwaukee mainstem and tributaries during 2009 and confirmed eight separate occurrences of black sandshells, most occurring downstream of the I-90 bridge (Szafoni, 2009). Healthy populations of black sandshell were found at seven sites stretching from the I-39 bridge over the Kishwaukee to within approximately four miles downstream of the I-90 bridge. One outlying population of black sandshells was found by the IDNR near Kirkland, Illinois on the South Branch Kishwaukee, approximately 19 miles from the I-90 bridge (Szafoni, 2009).

Openlands (Chicago, Illinois), conducted eleven mussel surveys on the mainstem Kishwaukee and tributaries as well as ten mussel surveys on the South Branch Kishwaukee during 2010 and 2011. All of Openlands surveys were located upstream of the I-90 bridge. Two occurrences of black sandshell were found by Openlands surveys. One site located approximately one mile upstream of the I-90 bridge near Newburg Road found two black sandshells and one site approximately two miles upstream of the I-90 bridge found one live black sandshell. (Openlands 2011)

Based on the recent mussel surveys, the black sandshell has sparse occurrence within two miles upstream, of the I-90 bridge. Openlands surveys found no recent occurrences farther east on the mainstem Kishwaukee than approximately two miles upstream of the I-90 bridge. Larger numbers of black sandshells appear more frequently downstream of the I-90 bridge. The main population of black sandshells in the Kishwaukee River mainstem occurs downstream of the I-90 bridge and continues for several miles as widely scattered individuals among mussel colonies of multiple species. The mussel resource as a whole between the I-90 and I-39 bridge can be termed a *Unique Aquatic Resource* based on IDNR evaluation of mussel resources alone. The 2008 IDNR publication on Biologically Significant Streams does not contain more recent records of black sandshells from the Kishwaukee.

Survey Methodology

A mussel survey was conducted at the I-90 bridge over the Kishwaukee River by Huff and Huff Inc. (H&H), on May 18, 2012. The first survey was conducted at the downstream side of the project limits, approximately 150 feet downstream (southwesterly), of the southern span of the I-90 bridge. A survey of living mussels was made until a living specimen of the black sandshell was found, at which point the survey within this section was ended in order not to further harass a protected species.

A second survey was conducted underneath the southern span of the I-90 bridge. No living mussels were encountered until approximately 50 feet upstream (northeasterly), of the northern span of the I-90 bridge. A single plain pocketbook (*Lampsilis cardium*), a common inhabitant of streams in Illinois was encountered. At approximately 75 feet upstream of the northern span of the I-90 bridge, living specimens of the black sandshell were observed in the sand. The second survey was ended at that point in order not to harass protected mussel species. Black sandshells are likely present at other places in the immediate area of the Kishwaukee River at the I-90 bridge. Table 2 depicts all of the mussels collected at the I-90 bridge during the May 18, 2012 surveys.

TABLE 2
Mussels at I-90 Bridge, Kishwaukee River
Winnebago County, Belvidere, Illinois, May 18, 2012

Genus species	Common Name	Live	Dead Shell
Lasmigona complanata	White heelsplitter	0	relic
Lasmigona costata	Fluted shell	1	3
Pyganodon grandis	Giant floater	0	relic
Ligumia recta *	Black sandshell*	2	0
Fusconaia flava	Wabash pigtoe	1	1
Quadrula pustulosa	Pimpleback	2	6
Alasmidonta marginata	Elktoe	1	4
Lampsilis cardium	Plain pocketbook	3	31
Lampsilis siliquoidea	Fatmucket	1	4
Venustaconcha ellipsiformis	Ellipse	0	1
Actinonaias ligamentina	Mucket	3	3
Amblema plicata	Threeridge	0	4
Leptodea fragilis	Fragile papershell	1	2
Total Live species		9	0
Total Live and Dead species		13	10
Total Specimens		15	59
Catch per unit effort		7.5/hour	

* Indicates Illinois State Threatened Species

An intensive survey was conducted for the black sandshell in the Kishwaukee River on August 8, 2012 underneath the I-90 bridge as well as 50 feet beyond the north and south perimeters of the bridge. A modified stratified sampling design as suggested by Smith (2006), Strayer and Smith, (2003) and Pooler and Smith, (2005) was utilized. Transects were used with multiple random starts, and scuba diving was not necessary due to the extremely low river levels during the drought of 2012.

The Kishwaukee River is divided into two channels by a "central" island. When allowing for a 50 foot wide right-of-way on either side of the bridge, the eastern channel measures 52 feet by 298 feet or 15,496 square feet. The western channel measured 117 feet by 298 feet or 34,866 square feet. Total channel area is 50,362 square feet (4679 square meters).

One black sandshell was found on the northeastern part of the study area during a May 2012 survey of an area of approximately 540 square feet. This area equals 50 square meters with a density of black sandshells of 0.02/square meter. A second black sandshell was found at the southeastern part of the study area during a survey of approximately 810 square feet. This area equals 75 square meters yielding a density of black sandshells of 0.013 /square meter.

Smith's equation (2006) was used to calculate the number of quadrats needed to detect further black sandshell presence at a confidence interval of 95% and a density of 0.013 m^2:

$$a = \mathrm{Ln}(1-Ci) / (-S * D)$$

Where: a = area (meters^2)
Ln = Log Normal
Ci = Confidence interval, assigned at 95%
S = decimal percentage of mussels assumed to be partially exposed at surface; assumed 1.0, (100% partially exposed)
D = Density black sandshell from previous survey using the lowest density of 0.013/m^2

Solving for a for the channel area of 4,679 meters^2: a = -2.99573/ -.013 meters^2, a = 230.4 meters^2.

1. A total of 230 square meters (2,475 square feet, minimum) was required to be searched for further black sandshell presence, distributed throughout the site. A minimum of 13 transects were needed (234 meters^2) throughout the site using scuba if required.

2. Additionally, half meter transects were proposed in the wadeable sections of the stream. Assuming that a minimum of one square meter transect was accomplished by shore collectors along all four shorelines of both channels combined, with each shorelines extending 298 feet (90 meters), an additional 360 square meters (3,875 square feet), of habitat was required to be surveyed.

3. All causeway areas were surveyed. Some of this area was included in the stratified transects from item 1, and was not double counted.

4. All living black sandshells or other Illinois protected species were measured, aged, sexed, and located by GPS locations for future relocation. Living black sandshells found during the proposed survey were returned to the position they were found, unless in immediate danger of desiccation due to falling river levels.

5. All non-protected mussels were relocated to appropriate habitat. Selected empty shells of all mussel species were taken for vouchering at the Illinois Natural History survey.

Thirty-nine person hours of surveys were conducted on August 8, 2012 as follows. The western channel was subdivided into two channels, separated by bridge piers. The far western channel was mostly dry with some areas of isolated, pooled, non-flowing water. The far western channel had pooled water at its northernmost end under the bridge that was still connected to the Kishwaukee River but this northernmost pool was shallow and not flowing. The far western channel was completely surveyed by crossing the area with 1.5 meter wide transects. Stranded mussels were secured in mesh bags placed in flowing water and eventually relocated to a location approximately 300 feet downstream of the bridge. A total of 267 feet by 40 feet (10,680 square feet) was surveyed in this manner. A total of two live and two dead black sandshells were taken from this 10,680 square feet area. The two living black sandshells were in jeopardy

of potential desiccation due to their position in a few inches of non-flowing water and were moved to a safe location downstream.

The main channel of the subdivided western channel was actively flowing and ranged from approximately 50 to 70 feet wide. The maximum depth of water was approximately 26 inches. The total area represented is approximately 16,020 square feet. Sixteen transects were performed that were each approximately 60 feet by 3.2 feet, totaling approximately 3,000 square feet of area covered. Two additional areas of proposed causeway were completely surveyed. Each area of proposed causeway measured approximately 17 feet by 60 feet, which added an additional 2,040 square feet total, of area surveyed. The total area covered by surveys in the main channel of the western channels was 5,040 square feet. Three living black sandshells were found and no dead black sandshells were observed.

The easternmost channel ranged in width from 30 feet to 60 feet with an average of 45 feet. The total water area of the eastern channel was approximately 12,015 square feet. Water depth ranged up to 28 inches and the bottom substrates were dominated by large cobble and gravel. Sixteen transects were performed, each approximately 45 feet by 3.2 feet, totaling approximately 2,300 square feet. Two additional areas of proposed causeway were completely surveyed. Each area of proposed causeway measured approximately 17 feet by 40 feet, which added an additional 1,360 square feet of area surveyed. The total area covered by surveys for the easternmost channel was 3,660 square feet. No living or dead black sandshells were found within the proposed causeway locations.

A total of 38,715 square feet of habitat was present during the Aug 8, 2012 survey, which represents approximately 77% of the estimated total habitat present during "normal" flow conditions. The decline of available, flowing, riverine habitat is due to the prolonged drought of 2012. A total of 234 live mussels were collected from available habitat representing 13 living species. Some of the living mussels recovered were collected on dry habitat or from drying, isolated pools. Dozens of fresh dead mussels were present on dry habitat where they had been subject to predation when exposed. Fresh dead mussels were not counted among the living mussels recovered. Five living black sandshells were collected from a total of 19,380 square feet of surveyed area. Two dead black sandshells were also present in the surveyed area. Based on the five living black sandshells found in 19,380 square feet of surveyed area, there is a potential of 13 living black sandshells to be present in the 38,715 square feet of habitat. Table 3 presents all of the living mussels found during the August 8, 2012 survey. Table 4 presents the data associated with the black sandshells found during the August 2012 survey.

TABLE 3
MUSSELS KISHWAUKEE RIVER AT I-90 BRIDGE
AS PERCENT OF LIVE CATCH, AUGUST 8, 2012

Common Name	Genus - species	Numbers Live	Dead or Relic*	% Live Catch
Mucket	*Actinonaias ligamentina*	112		47.9
Plain pocketbook	*Lampsilis cardium*	40		17.1
Elktoe	*Alasmidonta marginata*	29		12.4
Fluted shell	*Lasmigona costata*	14		6.0
Creeper	*Strophitus undulatus*	12		5.1
Fragile papershell	*Leptodea fragilis*	9		3.9
Fatmucket	*Lampsilis siliquoidea*	5		2.1
Black sandshell	*Ligumia recta*	5	2	2.1
Pimpleback	*Quadrula pustulosa*	3		1.3
Wabash pigtoe	*Fusconaia flava*	2		0.9
White heelsplitter	*Lasmigona complanata*	1		0.4
Giant floater	*Pyganodon grandis*	1		0.4
Pink papershell	*Potamilus ohiensis*	1		0.4
Threeridge	*Amblema plicata*	0	relic	0.0
Cylindrical Papershell	*Anodontoides ferussacianus*	0	dead	0.0
Creek heelsplitter	*Lasmigona compressa*	0	dead	0.0
Total	.....	234		100%
Catch / Unit Effort	.....	5.6/hour	.....	.....
Total Live Species	.....	13	.....	100%

*Dead Shell estimated < 5 years since death, Relic Shells represented as single valves

TABLE 4
BLACK SANDSHELLS AT I-90 BRIDGE
AUGUST 8,2012

Designation	Size (cm)	Age (years)	Sex	Original Location
Sandshell 1	13.3 x 4.2 cm	11	female	42.247322°N, 88.943972°W
Sandshell 2	14.9 x 4.8 cm	12	male	42.247322°N, 88.943972°W
Sandshell 3	16.5 x 5.3 cm	14	male	42.247493°N, 88.943789°W
Sandshell 4	13.3 x 4.1 cm	10	male	42.247044°N, 88.944077°W
Sandshell 5	8.5 x 2.7 cm	6	male	42.247044°N, 88.944077°W
Sandshell 6 dead	.....	.....	.....	42.247322°N, 88.943972°W
Sandshell 7 dead	.....	.....	.....	.....

C) Description of the activities that could result in the taking of a threatened or endangered species:

Reconstruction of the I-90 bridge over the Kishwaukee River will entail a variety of heavy construction activity to demolish existing roadway, piers, aprons, and to construct supporting piers, roadway, and aprons. In-stream work using causeways and coffer dams for supporting piers will be necessary under the bridge structure. Construction will be undertaken the eastbound portion of the two lane roadway during 2012-2013 while traffic is diverted to the westbound lanes. During 2014, all bridge traffic will be diverted to the newly constructed roadway, and the westbound lanes will be reconstructed. Temporary causeways and cofferdams will be needed in stream for reconstruction.

D) Explanation of the anticipated adverse effects on the listed species:

The black sandshell will likely not be visible during construction activities and avoidance of black sandshells will not be possible during in-stream preparations for roadway construction. Black sandshells may be subject to injury or death during in-stream phases of construction. Siltation from construction activities may harm black sandshells beneath the bridge or downstream from the construction site. During the period of larval incubation (August through the winter to the following July), female black sandshells may be sensitive to siltation.

2. Measures to minimize and mitigate impacts and funding available to undertake these measures.

A) Plans to minimize affected area, estimated number of black sandshells that will be taken and amount of habitat affected.

Minimization of the area affected is not feasible due to construction needs, but black sandshells within the survey area will be relocated. Collection of mussels present in the survey area will be accomplished with scuba diver/collectors familiar with mussel detection, assisted by shore collectors to cover more shallow areas. Relocation of black sandshells within the surveyed area will be accomplished once the permit has been finalized, if weather and river conditions are conducive.

Aquatic habitat that may be affected due to siltation will be minimized through the use of silt fences/erosion structures to prevent runoff from entering the river. A designated crew will install, inspect and maintain silt fences in accordance with the Tollway's specifications.

B) Plans for management of the affected area that will enable continued use by the listed species:

1. Siltation during all phases of construction will be minimized through use of erosion control devices such as silt fences to prevent runoff from entering the river and affecting black sandshell habitat. A designated crew will inspect and maintain silt fences/erosion structures.

2. If possible, black sandshells from the surveyed area will be collected from the project area and relocated to an appropriate location outside of the project area using approved methods for handling mussels with minimal stress.

3. The Tollway will follow specifications on erosion control and water quality best management practices (BMPs). There will be no direct input of highway runoff to the Kishwaukee River – all runoff will be diverted through a BMP prior to discharge into the river. Increasing retention time of runoff water will reduce sediment load and particulate/dissolved pollutants. The segment of the Kishwaukee River at the I-90 bridge is IEPA segment PQ-02, which is designated as impaired for PCB and fecal coliform bacteria. It is known that highway runoff water in general is contaminated by high fecal coliform numbers (Birch et al. 2004), but it is unknown if runoff water at the I-90 bridge follows this pattern. Land application of runoff water would help in reducing fecal coliform numbers directly entering the Kishwaukee.

4. After construction is completed in 2014, causeways, culverts and cofferdams will be removed and the stream bottom will be restored to its approximate original condition and flow pattern, allowing for re-colonization of biota.

C) Description of all measures to be implemented to minimize or mitigate the effects of the proposed action on listed species:

1. Implementation and maintenance of the soil, erosion, and sedimentation control plan will prevent runoff from entering the river.

2. Collection of all threatened mussels from previously surveyed areas will be accomplished. All mussels will be individually planted in the proper position with siphons pointing in an appropriate direction (usually upstream but current dependent). Mussels will be hand dug into appropriate substrates similar to the substrates removed from. Mussels must be hand buried to avoid having them use excess energy to rebury themselves, which could deplete the stored lipid reserves the mussels will use during the winter season. Black sandshells will be located, aged, sexed, measured, and marked by GPS coordinates.

4. Black sandshells will be offered as brood stock to the Genoa Fish Hatchery for use in a federal mussel reintroduction program, pending approval of appropriate state and federal representatives.

5. The Tollway will mitigate for black sandshell incidental take by supporting the Genoa Fish Hatchery program for propagation of threatened or endangered mussels. It is estimated that ten juvenile black sandshells must be transplanted in order for one shell to reach adult reproductive status. With the estimated presence of twelve black sandshells at the I-90 bridge, then 120 juvenile black sandshells should be transplanted to yield twelve reproductive black sandshells in the future. Fees may be paid directly to the Genoa Hatchery in lieu of mussel propagation and reintroduction.

D) Plans for monitoring the effects of measures implemented to minimize or mitigate the effects of the proposed action on endangered or threatened species.

1. Monitoring of relocated mussels will take place approximately 10-12 months after relocation to estimate survival. Monitoring will entail removal, logging, and immediate replacement of black sandshells to their exact location without bagging and holding of specimens in river water whenever possible. If the majority of the mussels are not encountered within the original perimeter of the relocation area, the limits of the survey will be extended 50 feet upstream of the perimeter of the relocation area, 100 feet to the side of the perimeter of the relocation area, and 150 feet behind the relocation area. Tags/markings, if any, will be refreshed as necessary. Voucher specimens of dead specimens may be collected under valid permit for desk measurement, growth, age and deposition in an appropriate museum (INHS, Field Museum).

A monitoring report will be furnished which will include the results of the recapture study for black sandshells, mortality (if any), and age of black sandshells, rationale for mortality of mussels, evidence of recruitment or juvenile mussels, habitat structure, and an analysis of stability or flux of substrates since last monitoring event.

2. A second phase of monitoring will take place 20-24 months after relocation using locations and techniques as described in Section 2.D.1. A monitoring report as described in Section 2.D.1. will be furnished to agencies in January of the following year.

3. A third phase of monitoring will take place approximately 36-48 months after relocation using locations and techniques as described in Section 2.D.1. A monitoring report as described in Section 2.D.1. will be furnished to agencies, with an analysis of age, growth and mortality over the entire monitoring period to gauge success or failure of the relocation. The monitoring report will be furnished in January of the year following the survey.

E) Adaptive management practices that will be used to deal with changed or unforeseen circumstances affecting the effectiveness of measures instituted:

1. Sediment/erosion control measures may be modified and supplemented to ensure maximum protection of the aquatic system as different phases of construction shift erosion points and channels. Erosion control measures/sediment structures will be evaluated and modified weekly or more often if weather events or shifts in construction area dictate modifications.

2. If the original mussel relocation area becomes untenable due to substrate flux or other factors, immediate consideration should be given to another relocation area.

F) Verification of adequate funding to support and implement all activities described in the conservation plan:

The monitoring costs for the first year and second year of monitoring are estimated to be approximately $2,000-$3,000 for each year. The monitoring cost for the final year of monitoring is estimated to be approximately $2,500-$3,600 dollars due to the expanded summary report required.

The cost of the initial mussel surveys to determine qualitative and quantitative abundance of mussels at the study site, relocate non-protected species, and move black sandshell is expected to be approximately $20,000. The estimated cost to support propagation of juvenile black sandshells at the Genoa Fish Hatchery is $1,200.

The Tollway guarantees funding support of implementation of mitigation activities.

3. Description of alternative actions the applicant considered that would not result in take, and the reasons that each of those alternatives was not selected. A "no-action" alternative shall be included in this description of alternatives.

The purpose of the project is to reconstruct and widen the Kishwaukee River bridge to provide greater traffic capacity. The need for the project has been identified due to traffic congestion and safety concerns throughout the I-90 corridor.

A no-action alternative would propose no improvements to the I-90 bridge over the Kishwaukee River and would produce no impacts to the aquatic resources of the Kishwaukee. The no-action alternative would produce a bottleneck in the expanded I-90 system and cause traffic congestion, which would have impacts on driver time, vehicle fuel consumption, and efficient commerce. The no-action alternative also does not address bridge deterioration and future rehabilitation work.

4. Data and information to indicate that the proposed taking will not reduce the likelihood of the survival of the endangered or threatened species in the wild within the State of Illinois, the biotic community of which the species is a part or the habitat essential to the species existence in Illinois.

It is anticipated that mussel relocation will not significantly reduce the population of black sandshells that may occur near the project area. While historical mussel relocations had various success rates from poor (<50% survival) to excellent (90% survival), recent relocations report >90% survival success when relocations are properly planned and executed, (Rueter et al., 2001, Baldridge et al. 2007, Cope et al. 2003, Peck 2007). The objective of this Conservation Plan is to remove as many black sandshells from the project area as possible with no mortality aside from natural mortality due to age, natural predation, or catastrophic flooding/drought events. Severe flooding events have the potential to move large bedloads of sediment quickly and potentially smother some mussel beds.

The Kishwaukee River is demonstrated as a rich mussel resource and contains a significant population of black sandshells in Illinois. While mussels in general may not spawn or recruit every year, black sandshells are known from both upstream and downstream locations relative to the I-90 bridge, and eventual recruitment from nearby populations would be anticipated. The ultimate success of the relocation would be dependent on finding juvenile black sandshells at a future date during monitoring.

5. Implementing Agreement:

A) the names and signatures of all participants in the execution of the conservation plan

Names and Signatures are provided at the end of this document.

B) the obligations and responsibilities of each of the identified participants with schedules and deadlines for completion of activities included in the conservation plan and a schedule for preparation of progress reports to be provided to the Department

Applicant. Illinois State Toll Highway Authority, Paul Kovacs, Chief Engineer, Downers Grove, Illinois 60515.

Conservation Plan Developers Bryan Wagner, Senior Environmental Planner, Illinois State Toll Highway Authority; Alycia Kluenenberg, Senior Scientist, Huff and Huff Inc, Roger Klocek, Senior Biologist, Huff and Huff Inc.

Conservation Plan Implementers Bryan Wagner, Illinois State Toll Highway Authority; Roger Klocek, Huff and Huff Inc. will arrange mussel relocations in consultation with IDNR.

Conservation Plan Monitors. Sedimentation/Erosion monitors are yet to be determined by Tollway. Mussel monitors are yet to be designated by Tollway but can include INHS personnel.

Conservation Plan Funder/Enabler, include designees and sub-contractors. Tollway will be the funder/enabler of the Conservation Plan. Bryan Wagner will be the representative for the Tollway during this process.

C) Certification:

The Tollway certifies that their agency has the authority to complete the project and to address the issues proposed in the Incidental Take Plan in the event state listed threatened or endangered species are encountered. The Tollway is in charge of construction through its designated subcontractors. The Tollway will assure that all applicable state laws will be adhered to during the completion of the project.

D) Assurance of compliance with all other federal, state and local regulations pertinent to the proposed action and to execution of the conservation plan

The Tollway is compliant with all other federal, state, and local regulations pertinent to the proposed action and execution of the conservation plan.

E) Copies of any final federal authorizations for a taking already issued to the applicant.

No federal authorization needed for the I-90 bridge project at the Kishwaukee River.

F) The Department, after review and public comment, may require additional measures as necessary or appropriate to the success of the conservation plan. Requirements for additional measures shall be based on the life history needs of the species involved.

G) A Habitat Conservation Plan approved by the U.S. Fish and Wildlife Service pursuant to Section 10 of the Endangered Species Act of 1973 [26 USC 1539], and amendments thereto, may be submitted in lieu of the conservation plan described in this Section.

No federal Habitat Conservation Plan needed for the I-90 bridge project as federally protected species are not present in the project area.

H) Authorization to take an endangered or threatened species under the terms of a biological opinion issued by the U.S. Fish and Wildlife Service pursuant to Section 7 of the Endangered Species Act of 1973 [26 USC 1536], and amendments thereto, or regulations implementing Section 7 [50 CFR 402] may be submitted in lieu of the conservation plan described in this Section.

Not applicable for the I-90 bridge project as federally protected species are not present in the project area.

Signatories

Name Paul Kavanaugh Date: 11/19/12

Illinois State Toll Highway Authority Representative