

Illinois Department of Natural Resources
CONSERVATION PLAN
(Application for an Incidental Take Authorization)
Per 520 ILCS 10/5.5 and 17 Ill. Adm. Code 1080

150-day minimum required for public review, biological and legal analysis, and permitting

PROJECT APPLICANT: Douglas County Highway Department
Attn: James Crane, County Engineer
200 S. Prairie
Tuscola, IL 61953

PROJECT NAME: TR 218 (760N) over Brushy Fork Bridge Replacement

COUNTY: Douglas

AREA OF IMPACT: 100 linear feet of stream (0.10 Acres of temporary impacted habitat area under bridge including stream banks)

The incidental taking of endangered and threatened species shall be authorized by the Illinois Department of Natural Resources (IDNR) only if an applicant submits a conservation plan to the IDNR Incidental Take Coordinator that meets the following criteria:

1. A **description of the impact likely to result** from the proposed taking of the species that would be covered by the authorization, including but not limited to -

A) Identification of the **area to be affected** by the proposed action, include a legal description and a detailed description including street address, map(s), and GIS shapefile. Include an indication of ownership or control of affected property. Attach photos of the project area.

The project construction area is located on TR 218 (760N) over Brushy Fork 4 miles southwest of Newman, Douglas County, Illinois (Latitude 39.76342°N, Longitude 88.05265°W); more specifically located at Township 15 North, Range 10 East, NW/4, Section 11, 3rd Principal Meridian. See attached location map, aerial photo, project site photographs, and preliminary plan sheet for additional information. The existing bridge and roadway are under jurisdiction of Sargent Township.

Brushy Fork is a tributary of the Embarras River in east-central Illinois and flows southwest for approximately 8 miles before it reaches the confluence with the Embarras River.

The Brushy Fork is a natural meandering channel in a primarily agricultural rural area.

The construction activities for the bridge replacement will take place within the proposed Sargent Township right-of-way only. See the attached plat drawing and preliminary plan sheet for additional information.

B) **Biological data** on the affected species including life history needs and habitat characteristics. Attach all pre-construction biological survey reports.

The Environmental Survey Request (ESR) process for the proposed bridge replacement involved coordination with IDNR for the presence of threatened and endangered species. As a result, the attached IDNR consultation letter dated December 3, 2020 identified the presence of the following protected resource occurring in the vicinity of the project area and proposed action:

State-endangered Purple Lilliput (*Toxolasma Lividum*)

The most recent biological mussel survey was performed on August 12, 2020. A total of 8 live mussels representing 5 species were collected during this survey. A table of mussels collected and documented at the site is shown in the attached Brushy Fork Mussel Data (Table 1) and the Raw Mussel Data (Appendix 2).

According to the attached Mussel Report, mussels listed as threatened or endangered on the Illinois Endangered Species List were returned to the approximate locations they were collected, and species not under legal protection at the state or federal level were relocated to an area approximately 200 feet downstream (southwest) of the County Road 760N (TR 218) bridge.

The Purple Lilliput are small mussels (<2 inches long) that are found in small to medium rivers in slow to swift currents among mud, sand, and gravel substrates.

Glochidia Host Fish for Purple Lilliput

The most recent biological fish survey was performed on July 15, 2020. A total of 18 different fish species were collected during this survey. A table of fishes collected and documented at the site is shown in the attached Brushy Fork Fish Data (Table 1).

The glochidia host fish of purple lilliput is the *Lepomis* species of fish. Two species of suitable host fish were found during field survey, Green Sunfish (*Lepomis cyanellus*; n=1) and Longear Sunfish (*Lepomis megalotis*; n=11).

C) **Description of project activities** that will result in taking of an endangered or threatened species, including practices and equipment to be used, a timeline of proposed activities, and any permitting reviews, such as a USFWS biological opinion or USACE wetland review. Please consider all potential impacts such as noise, vibration, light, predator/prey alterations, habitat alterations, increased traffic, etc.

The project earliest letting is planned for Summer 2022 with an assumed timeline for Phase III completion in Summer 2023. The exact start date will be determined by the Contractor once the project is awarded.

The existing bridge will be completely removed and replaced with a new three span precast prestressed concrete deck beam bridge on pile bent spill-thru abutments and solid wall encased pile bent piers. The new piers will require temporary cofferdams.

The existing structure is a six (6) span bridge with a superstructure consisting of a timber deck on steel stringers. The substructure consists of timber pile bents and two masonry stone abutments. There are three (3) timber piles driven into the streambed at each

timber pile bent. The existing structure is currently closed to traffic and portions of the existing structure have fallen into the stream with debris collecting on the existing timber pile bents. The contractor will cut off all timbers and remove all debris from the streambed to allow the construction of the new piers. Original timber piles shall be cut off to the standard 1 foot below grade. The means and methods of removal and equipment required will be determined by the Contractor once the project is awarded. Machinery may be required in the stream temporarily during existing structure removal operations. The masonry abutments will be removed as necessary to allow the grading of the new spill-thru abutments and placement of riprap.

The two (2) new solid wall encased pile bent piers will be located in the water, 51'-0" apart, centered about the middle of the new bridge. Temporary cofferdams will be required in the stream (approximately dimensioned 11'x37' sheet piling at each pier) to construct the new bridge piers. If the contractor requires a temporary work pad, access road, or other temporary fill, then all affected areas shall be removed in their entirety and returned to pre-construction elevations. Temporary fills shall be constructed of clean coarse aggregate, and the areas affected by these fills shall be restored as soon after construction as possible. Details regarding these items will be determined by the contractor at the time of construction. A temporary work pad or causeway at the piers may be required for this project.

Stone riprap will be placed on the abutment slopes to protect the proposed spill-thru abutments from scour. Stone riprap (RR4, 9" median size) will be placed in front of the bridge abutments down to the streambed at the channel (Elevation ± 616.0). The limits of the riprap will be minimized and avoid filling in the wetlands upstream and downstream from the bridge. The areas between the ROW lines and outside of the stream and riprap will be seeded with seed mix Seeding Class 2. The bed material for the placement area will be graded so that the finished surface of the riprap will conform to the existing channel slopes and transition to match the existing channel at the right-of-way line. A small amount of channel excavation behind the masonry abutments is required. The stone riprap will be placed by mechanical means to its full course thickness in one operation. Temporary stockpiling of riprap or excavated material in the channel will not be allowed.

D) Explanation of the anticipated **adverse effects on listed species**;

- How will the proposed actions impact each of the species' life cycle stages?

In a letter dated December 3, 2020, IDNR made a determination that the removal of the existing piers and the placement of riprap in the stream is likely to have an adverse impact on the state listed endangered Purple Lilliput (*Toxolasma Lividum*).

The proposed actions will disturb any adult individuals present in the streambed at the bridge site. The parasitic glochidia may not be able to find a host fish in the area during construction activities in the stream. Construction activities below the water surface will be periodic and may result in taking of the purple lilliput in all life cycle stages.

- Describe potential impacts to individuals and the population. Include information on the species life history strategy (life span, age at first reproduction, fecundity, recruitment, survival) to indicate the most sensitive life history stages.

Any established individuals that remain in the project limits will be subject to disturbance of the water and streambed due to the removal of the existing structure, pier construction, and the grading and placement of riprap at or below the waterline.

Already established individuals, juveniles, or glochidia may be crushed or smothered by construction activities.

- Identify where there is uncertainty, place reasonable bounds around the uncertainty, and describe how the bounds were determined. For example, indicate if it is uncertain how many individuals will be taken, make a reasonable estimate with high and low bounds, and describe how those estimates were made.

The number of individual Purple Lilliput mussels to be taken is uncertain, but at a maximum all 2 individuals surveyed will be taken. Since the proposed structure will include cofferdams, tremie concrete, structure excavation, channel excavation, and riprap, the total number of takes may be concentrated in the area under the bridge. Construction activities below the water surface will be periodic for a given activity over the entire project timeline.

2) Measures the applicant will take to **minimize and mitigate** that impact and the **funding** that will be available to undertake those measures, including, but not limited to -

A) Plans to **minimize the area affected** by the proposed action, the estimated **number of individuals** of each endangered or threatened species that will be taken, and the **amount of habitat** affected (please provide an estimate of area by habitat type for each species).

The work area has been minimized to reduce impact to the streambed and water quality as much as practical. The work area is between wetland areas to avoid impacts to the wetlands as much as possible. The amount of habitat impacted is equal to the area required to remove piers, install new piers, construct spill-thru abutment channel excavation, and grade the bed for the stone riprap installation. The total area of temporary habitat impacted will be approximately 4,400 square feet (approximately 0.10 acres). The length of temporary stream channel impact within the work area is 100 linear feet. The cofferdams (sheet piling) will contain the construction of the piling and solid wall during construction, limiting the amount of material entering the stream.

The number of individual Purple Lilliput mussels to be taken is uncertain, but at a maximum all 2 individuals surveyed will be taken.

According to the attached Mussel Report, mussels listed as threatened or endangered on the Illinois Endangered Species List were returned to the approximate locations they were collected, and species not under legal protection at the state or federal level were relocated to an area approximately 200 feet downstream (southwest) of the County Road 760N (TR 218) bridge.

The Department will compel a relocation effort for listed mussels under the bridge. This will be 25 m downstream and 20 m upstream to include a buffer.

The IDNR has determined a compensatory mitigation of \$16,742.40 for potential taking of Purple Lilliput during this project.

B) Plans for management of the area affected by the proposed action that will **enable continued use** of the area by endangered or threatened species by maintaining/re-establishing suitable habitat (for example, native species planting, invasive species control, use of other best management practices, restored hydrology, etc.).

The Resident Engineer (RE), acting as the county's representative, will be responsible for the management of the project, including the measures outlined in this conservation plan and in the construction plans and documents.

Similar habitat of equal quality exists both upstream and downstream of the impacted project area. According to the attached Mussel Report, mussels not under legal protection at the state or federal level were relocated to an area approximately 200 feet downstream (southwest) of the County Road 760N (TR 218) bridge.

During construction, noise generated by construction activities should cause mussels to seek calmer waters both upstream and downstream during the project timeline.

After work is completed near the bridge, the streambed and habitats will no longer be affected by the construction work. The habitat will return to being controlled naturally, namely by flooding. If the stream disturbance in the area is minimized, the mussels are expected to move back into the area under the bridge over time.

The only physical impact remaining once construction is complete will be the solid wall encased pile bent piers. Riprap will only cover the streambed at the toe of the abutment slopes.

C) Description of all measures to be implemented to avoid, minimize, and mitigate the effects of the proposed action on endangered or threatened species.

- Avoidance measures include working outside the species' habitat.
- Minimization measures include timing work when species is less sensitive, reducing the project footprint, or relocating species out of the impact area.
- Mitigation is additional beneficial actions that will be taken for the species such as needed research, conservation easements, propagation, habitat work, or recovery planning.
- It is the **applicant's responsibility to propose mitigation measures**. IDNR expects applicants to provide species conservation benefits 5.5 times larger than their adverse impact.

Soil conservation measures will be implemented during construction. Practices will include perimeter erosion barrier, ditch checks, erosion control seeding, and erosion control blankets used to minimize the amount of eroded soil entering the channel.

The road is currently closed and will remain closed during construction. Construction activity shall be accomplished from the banks for a majority of the work during construction. Only the pier construction and riprap placement may have a temporary negative impact to water quality during construction.

D) Plans for **monitoring** the effects of the proposed actions on endangered or threatened species, such as monitoring the species' survival rates, reproductive rates, and habitat before and after construction, include a plan for follow-up **reporting to IDNR**. Monitoring surveys should be targeted at reducing the uncertainty identified in Section 1.d.

The Resident Engineer (RE), acting as the county's representative, will be responsible for the installation of all erosion control measures to ensure that they are constructed and installed in accordance with the plans. The RE will ensure proper maintenance of these installations, with inspections regularly, particularly after periods of heavy rainfall.

The means and methods of construction including all equipment required and where it will be used will be determined by the Contractor once the project is awarded.

For monitoring the area after construction, the Department will compel surveys that use a combination of semi-quantitative and qualitative at 1 and 5 years after construction, and a report within 90 days of each survey at both the Area of Direct Impact (ADI) and the relocation site.

E) **Adaptive management practices** that will be used to deal with changed or unforeseen circumstances that may affect the endangered or threatened species.

- Adaptive management is a way to make decisions in the face of uncertainty by monitoring the uncertain element over time and adjusting to the new information. Adaptive management requires identifying objectives and uncertainties, thinking through a range of potential outcomes, developing triggers that will lead to different actions being taken, and monitoring to detect those triggers.
- Consider environmental variables such as flooding, drought, and species dynamics as well as other catastrophes. Management practices should include contingencies and specific triggers. Note: Not foreseeing any changes does not qualify as an adaptive management plan.

During the construction activities that were described previously in the streambed impact area, the installation and effectiveness of soil conservation practices will be implemented and monitored daily by the RE. If through daily monitoring of the site, eroded soil is observed leaving the jobsite or limits of construction, additional soil conservation measures shall be taken to reduce soil erosion.

F) **Verification that adequate funding exists** to support and implement all minimization and mitigation activities described in the conservation plan. This may be in the form of bonds, certificates of insurance, escrow accounts, or other financial instruments adequate to carry out all aspects of the conservation plan.

The project is funded with federal funding, with a combination of 90% federal funds and 10% local funding. The project construction, including the implementation of all measures of the Conservation Plan, will be funded for this improvement out of the County's allotment.

3) A description of **alternative actions** the applicant considered that would reduce take, and the reasons that each of those alternatives was not selected. A **"no-action" alternative** shall be included in this description of alternatives. Please describe the economic, social, and ecological tradeoffs of each action.

- Consideration of **alternative actions** is an important tool in conservation planning as it allows for thinking of other options and evaluating the potential outcomes in terms of all relevant objectives. However, to be useful it requires creativity in developing alternatives and systematic analysis in evaluating the alternatives.
- In evaluating alternatives, describe the economic, social, and ecological tradeoffs of each.

Alternative A – "No-Action":

The only alternative which does not result in the taking of the state listed species is to leave the existing bridge in place, or the "no-action" alternative. The bridge would continue to deteriorate in its failed condition. Further failure over time could lead to more debris falling into the stream, which could also impact the species. This option was not considered.

Alternative B – "Rehabilitation":

The existing structure was originally built in 1900 on masonry abutments and then rebuilt in 1972 as a six-span timber deck on steel stringer bridge on five (5) timber pile bent piers and masonry closed abutments. The existing substructure is in a failed condition. The timber pile bents supporting the structure would need to be completely removed and replaced. The proposed bridge width requires reconstruction of the entire bridge. The masonry abutments have been in service for over 120 years and are in poor condition. Widening of the masonry closed abutments is not economical. This alternative is not considered economical or feasible for this project.

Alternative C – "New Alignment":

At this location, the "new alignment" alternative is not practical or economical, and has the same negative impact to the stream and species as the Total Replacement option. Additional wetlands could also be potentially impacted as wetland areas were surveyed both upstream and downstream from the existing bridge. This alternative was not considered.

Alternative D – "Total Replacement":

The final option would be the total replacement option. This option is the most economical alternative and will provide a minimal impact to right-of-way, property, wildlife, wetlands, and the state listed species. A new structure will have lower future maintenance costs. The new structure eliminates three (3) of the existing bridge piers in the channel, thus minimizing habitat impact to the species in the future. Only two (2) proposed bridge piers will be constructed and remain in the streambed. Once the new structure is constructed and the stream returns to normal flow conditions, the Purple Lilliput should return to the stream under the new bridge and use the site as habitat.

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.

The Purple Lilliput is found throughout the tributaries to the Embarras River, throughout its entire range. The project location is not known to be associated with any essential habitat for the Purple Lilliput in Illinois. The mussel has also been found at another bridge downstream (600N, See attached Brushy Fork Mussel Data Table 1).

The temporary loss of habitat for this project is estimated to be the impacted stream under the bridge around the piers and including the banks or 4,400 S.F. (0.10 Acres).

5) An **implementing agreement**, which shall include, but not be limited to (on a separate piece of paper containing signatures):

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



James Crane, County Engineer
Douglas County Highway Department

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 IDNR;

The Douglas County Highway Department is responsible for securing authorization for incidental take of state-listed species, obtaining and securing all necessary state and local permits, and inspection of the work and contractor's compliance with the design contract documents. A progress report will submitted to the IDNR within 90 days of completion of the project (completion shall be defined as: the first day the new bridge is open for use by the general public).

The project earliest letting is planned for Summer 2022 with an assumed timeline for Phase III completion in Summer 2023. The exact start date will be determined by the Contractor once the project is awarded.

C) Certification that each participant in the execution of the conservation plan has the legal authority to carry out their respective obligations and responsibilities under the conservation plan;

The Illinois Department of Natural Resources shall be responsible for the review of this Conservation Plan and for subsequent issuance of the Incidental Take Authorization.

This project is authorized by the Illinois Department of Transportation, who oversees the use of federal-distributed funding among local agencies.

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 Douglas County Highway Department, as directed by the Illinois Department of Transportation, exclusively abides by the National Environmental Policy Act and all associated state environmental laws in carrying out its mission of performing the most environmentally sensitive methods of transportation planning and engineering.

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

Not applicable.

Enclosures:

Location Map

Location Map - Aerial Photo

Site Photographs

Preliminary Plan Sheet

Preliminary Right-of-way Plat Sheet

Species Fact Sheet

Biological Survey Data – Brushy Fork

Mussel Data Table 1

Mussel Raw Data Appendix 2

Fish Data Table 1

IDOT NRR Biological Consultation Letter

IDNR Consultation Letter

US Army Corps of Engineers Letter

Mussel Report

PLEASE SUBMIT TO:

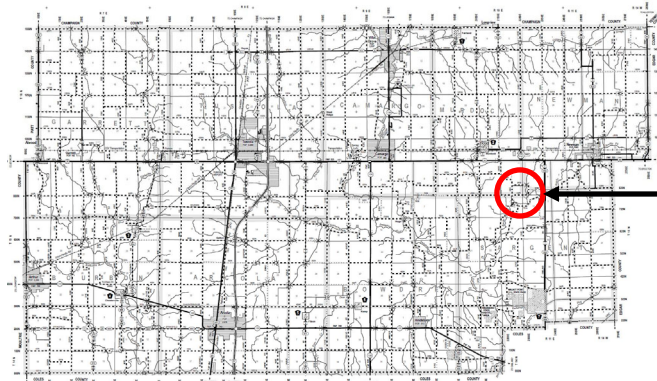
**Incidental Take Authorization Coordinator, Illinois Department of Natural Resources,
Division of Natural Heritage, One Natural Resources Way, Springfield, IL, 62702**

OR

DNR.ITAcoordinator@illinois.gov

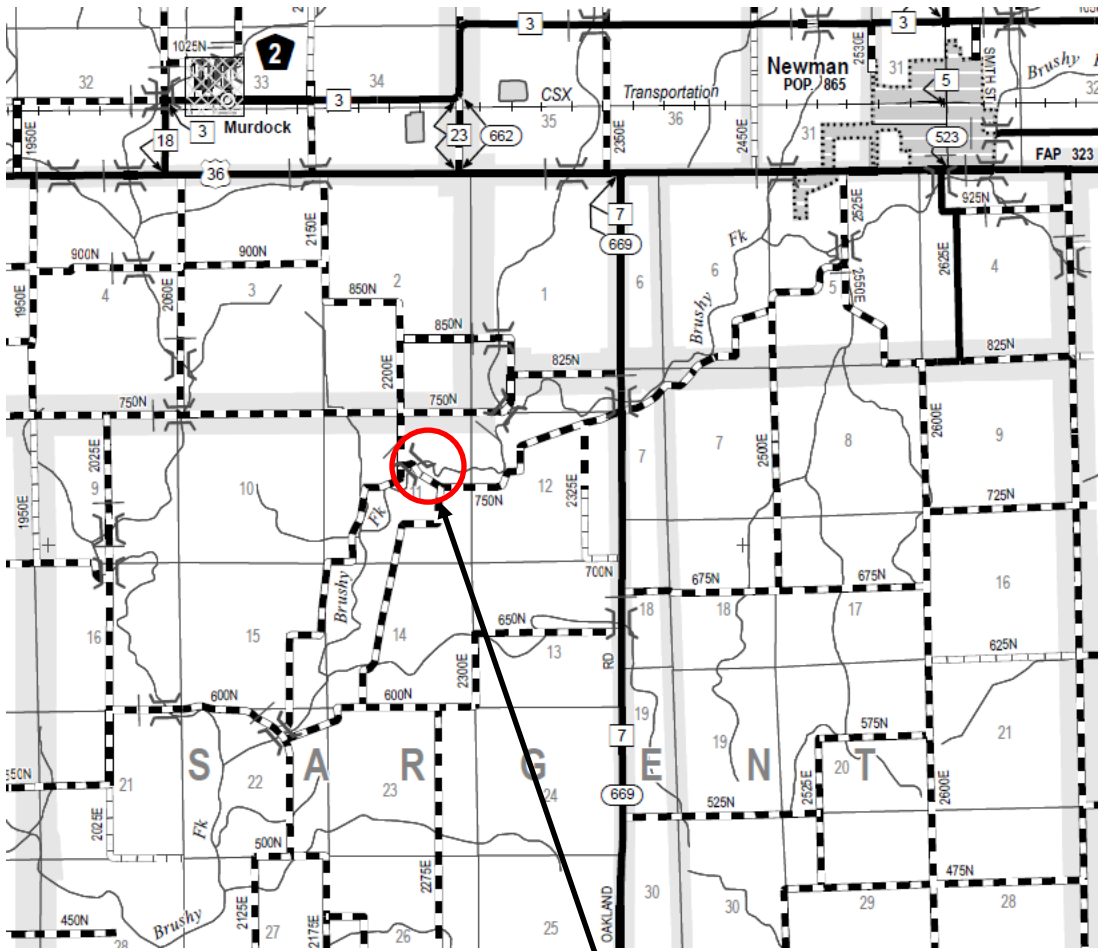
July 2016

Location Map

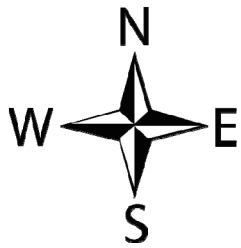


Project Location

DOUGLAS COUNTY



Project Location



SEC 11, T15N, R10E 3rd PM
Section 07-08119-01-BR
TR 218 (760N) over Brushy Fork
4 miles southwest of Newman
Sargent Township, Douglas County
Existing SN 021-4801
Proposed SN 021-4825

Location Map - Aerial Photo



Existing SN 021-4801
Douglas County
TR 218 over Brushy Fork
Sargent Township

Site Photographs



Looking southeast at north end of bridge over Brushy Fork



Looking southeast along TR 218

Existing SN 021-4801
Douglas County
TR 218 over Brushy Fork
Sargent Township



CR 2225 Looking southeast along TR 218



Looking northwest along TR 218 at CR 2225

Existing SN 021-4801
Douglas County
TR 218 over Brushy Fork
Sargent Township



North Abutment – Looking Northwest (Upstream side of bridge)



North Abutment – Looking North (Downstream side of bridge)

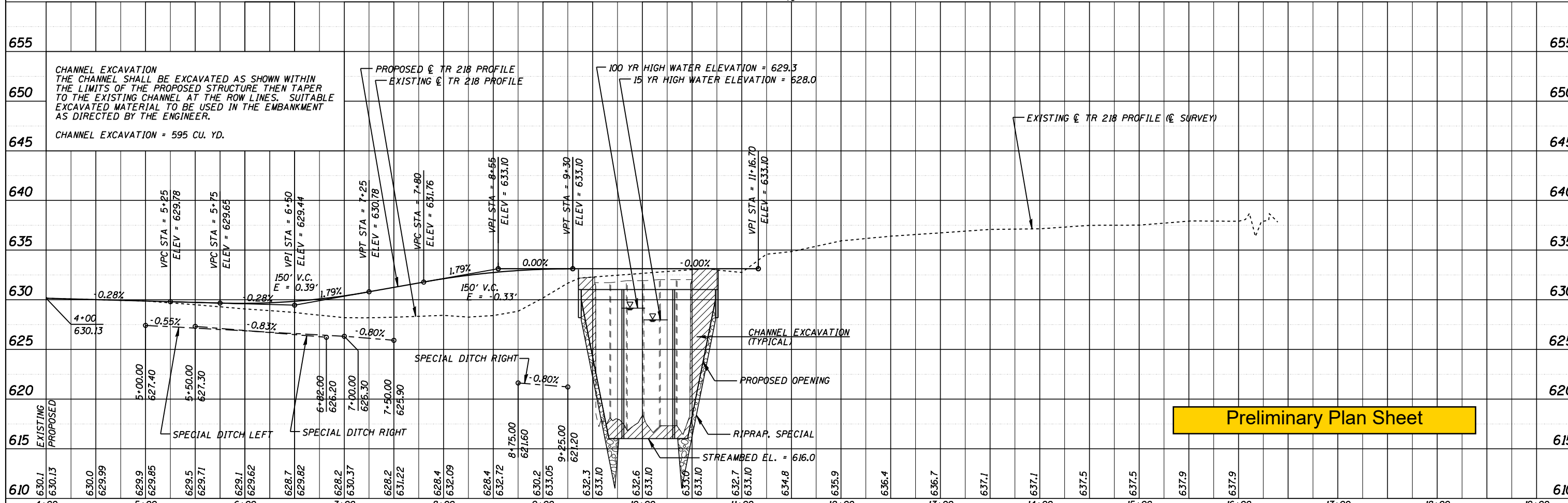
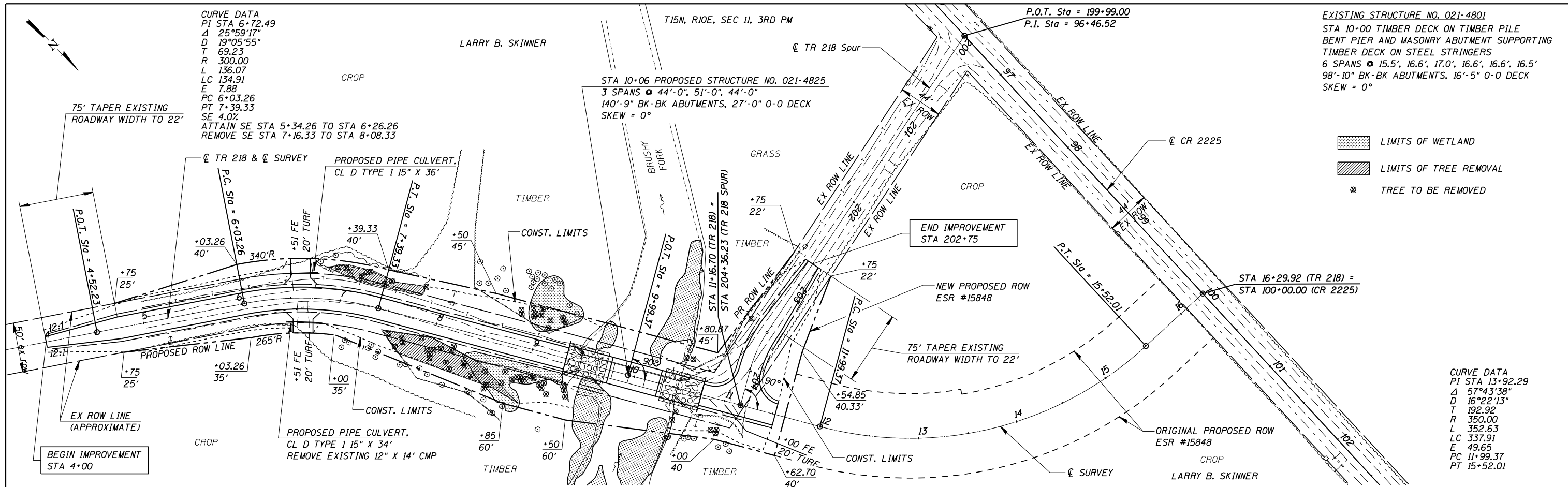
Existing SN 021-4801
Douglas County
TR 218 over Brushy Fork
Sargent Township



Brushy Fork Looking Upstream

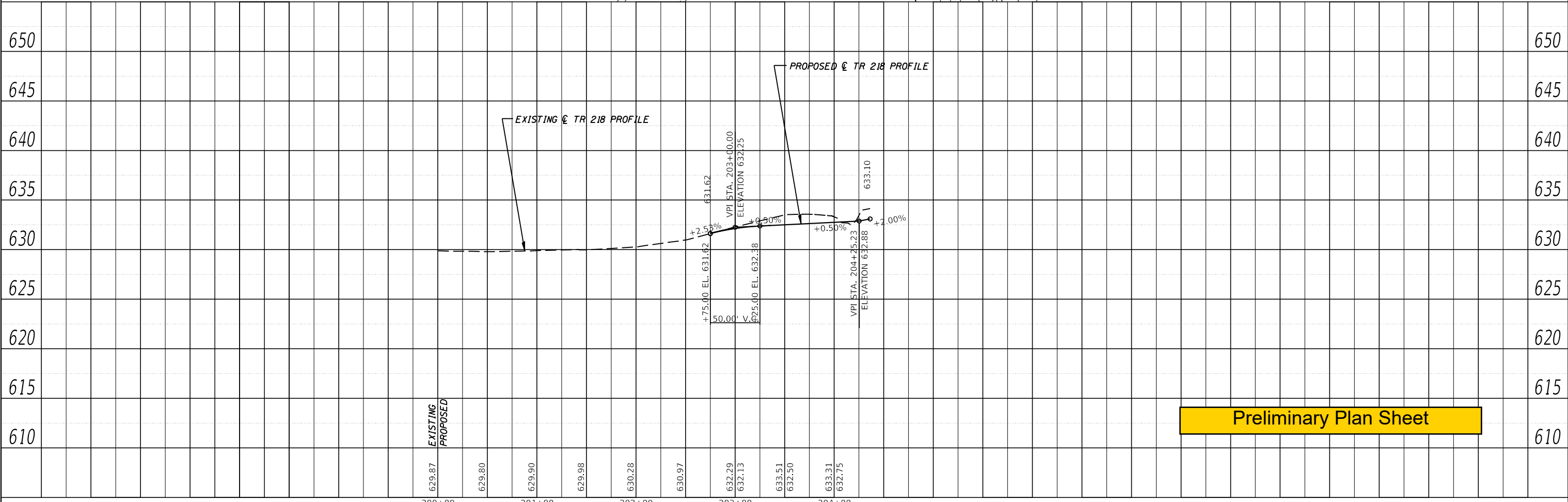
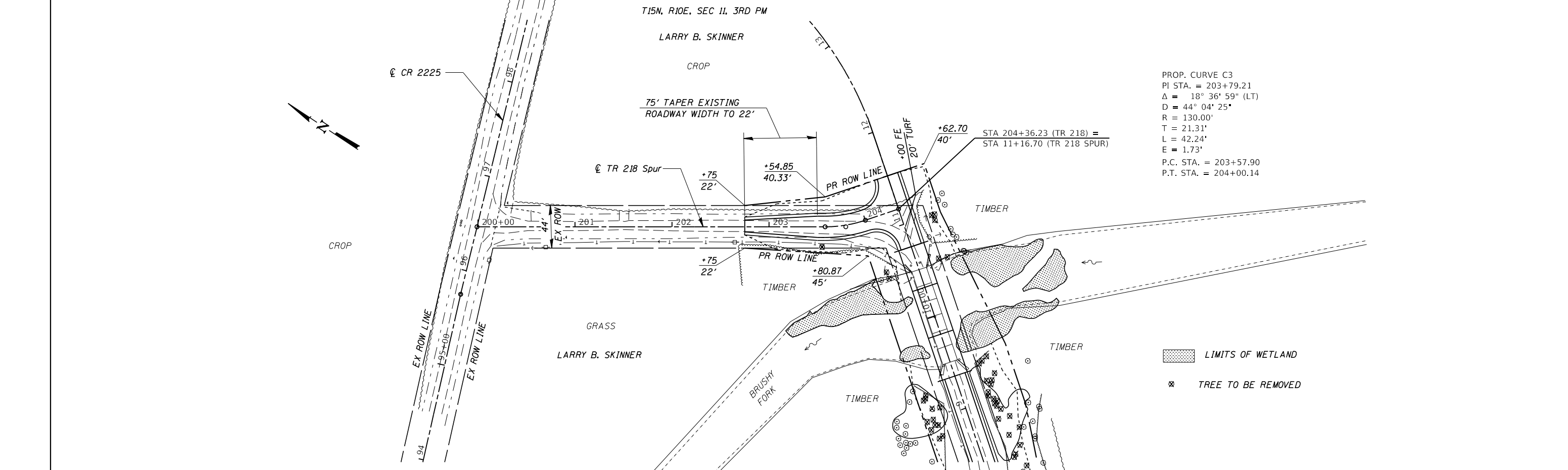


Brushy Fork Looking Downstream



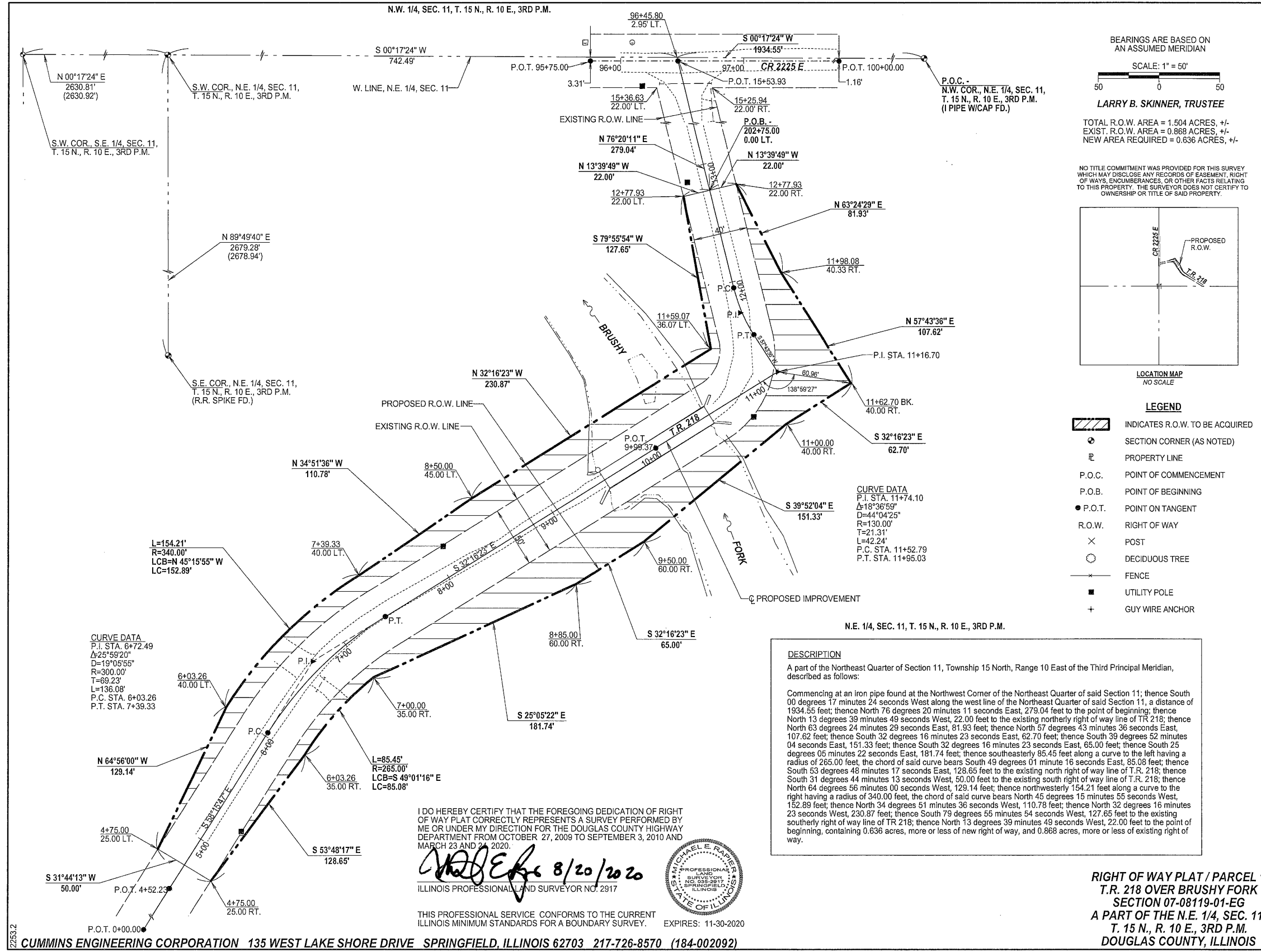
Preliminary Plan Sheet

| | | | | | | | | | | | |
|--|---------------------------------|---|------------------|-----------|--|------------------------------------|--------------|------------------------|----------------|---|-------------|
| CEC Civil and Structural Engineering | Cummins Engineering Corporation | JOB # 2253 FILE NAME = 2253pp.dgn PLOT SCALE = 100.0000 Ft / in. PLOT DATE = 6/18/2020 | DESIGNED - NAK | REVISED - | DOUGLAS COUNTY TR 218 IMPROVEMENTS | PLAN & PROFILE - TR 218 | TR RTE. 218 | SECTION 07-08119-01-EG | COUNTY DOUGLAS | TOTAL SHEETS 1 | SHEET NO. 1 |
| | | | DRAWN - TSH | REVISED - | | | CONTRACT NO. | | | FED. ROAD DIST. NO. ILLINOIS FED. AID PROJECT | |
| | | | CHECKED - NAK | REVISED - | SCALE: SHEET NO. OF SHEETS STA. 4+00 TO STA. 19+00 | | | | | | |
| | | | DATE - 6/18/2020 | REVISED - | | | | | | | |



Preliminary Plan Sheet

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|--|----------------------------------|------------------|-----------|---|------------------------------------|-------------------|---------------------------|----------------------------|-----------------|--------------|
| CEC Cummins Engineering Corporation Civil and Structural Engineering | JOB = 2253 | DESIGNED - TEC | REVISED - | DOUGLAS COUNTY TR 218 IMPROVEMENTS | PLAN & PROFILE - TR 218 | TR RTE. 218 | SECTION 07-08119-01-EG | COUNTY DOUGLAS | TOTAL SHEETS | SHEET NO. |
| | FILE NAME = 2253.2-sht-p&p50.dgn | DRAWN - TSH | REVISED - | | | SCALE: | SHEET NO. OF SHEETS | STA. 200+00 TO STA. 204+00 | CONTRACT NO. | |
| | PLOT SCALE = 100.0000' / in. | CHECKED - MDC | REVISED - | | | | | | | |
| | PLOT DATE = 6/18/2020 | DATE - 6/18/2020 | REVISED - | | | | | | | |



Preliminary Plat Sheet

Table 1. Summary of freshwater mussels recorded from Brushy Fork in Douglas County, Illinois (INHS Mollusk Collections Data 2020). Mussels collected from Brushy Fork at the County Road 760N (TR 218) bridge by INHS personnel on 12 August 2020 are outlined by a black border. Sites are arranged left to right from upstream-most to downstream-most survey location within Brushy Fork. **SE** = Illinois Endangered.

| | County Road | 2780E | 2510E | 800N | ----2300E---- | | -----760N----- | | | | 600N | |
|---------------------------------------|---------------------------|---------------|-----------|-----------|---------------|----------|----------------|-----------|------------|----------|-----------|-----------|
| | | Year Surveyed | 2012 | 2014 | 2014 | 1996 | 1997 | 1997 | 2001 | 2011 | 2012 | 2020 |
| <i>Alasmidonta marginata</i> | Elktoe | | | | | | | | | | | 1 |
| <i>Amblema plicata</i> | Threeridge | 27 | 7 | 16 | | relict | relict | 43 | 81 | dead | 2 | 11 |
| <i>Anodontoides ferussacianus</i> | Cylindrical Papershell | 5 | | | | | relict | relict | | | | |
| <i>Cyclonaias pustulosa</i> | Pimpleback | | 1 | | | | | | | | | |
| <i>Fusconaia flava</i> | Wabash Pigtoe | 21 | 14 | 6 | dead | | dead | 7 | 11 | dead | 1 | 5 |
| <i>Lampsilis cardium</i> | Plain Pocketbook | 4 | 3 | dead | relict | | | dead | 4 | | relict | relict |
| <i>Lampsilis hydiana</i> | Louisiana Fatmucket | 15 | 14 | 2 | dead | | dead | 7 | 9 | | 2 | 1 |
| <i>Lasmigona complanata</i> | White Heelsplitter | 20 | 2 | | | | | relict | 2 | | | 3 |
| <i>Lasmigona compressa</i> | Creek Heelsplitter | | | dead | | | | | | relict | | |
| <i>Lasmigona costata</i> | Flutedshell | | | | | | | | | relict | | |
| <i>Leptodea fragilis</i> | Fragile Papershell | 12 | 1 | dead | | | | | | | relict | 6 |
| <i>Pleurobema sintoxia</i> | Round Pigtoe | | | | | | | 1 | 4 | dead | 1 | 8 |
| <i>Ptychobranchnus fasciolaris SE</i> | Kidneyshell | | | | | | | | 1 | | | |
| <i>Pyganodon grandis</i> | Giant Floater | 51 | 24 | 2 | dead | | relict | dead | 2 | | relict | 2 |
| <i>Quadrula quadrula</i> | Mapleleaf | 1 | | | | | relict | | | | | 1 |
| <i>Strophitus undulatus</i> | Creeper | 1 | 1 | dead | | | relict | dead | dead | dead | relict | 2 |
| <i>Toxolasma lividum SE</i> | Purple Lilliput | | | 3 | | | | relict | 1 | dead | 2 | 2 |
| <i>Toxolasma parvum</i> | Lilliput | 2 | 7 | | | | | | relict | | | |
| <i>Tritogonia verrucosa</i> | Pistolgrip | | | 1 | | | | | 6 | | dead | relict |
| <i>Truncilla truncata</i> | Deertoe | dead | dead | | | | | | | | | |
| <i>Uniomerus tetralasmus</i> | Pondhorn | relict | | | | | | | | | dead | |
| <i>Utterbackia imbecillis</i> | Paper Pondshell | | 1 | | | | | | | | | |
| <i>Villosa lienosa</i> | Little Spectaclecase | 6 | 1 | 2 | | | | dead | 2 | relict | relict | dead |
| | Total Individuals | 165 | 76 | 32 | 0 | 0 | 0 | 58 | 123 | 0 | 8 | 42 |
| | Total Live Species | 12 | 12 | 7 | 0 | 0 | 0 | 4 | 11 | 0 | 5 | 11 |
| | Total Species | 14 | 13 | 11 | 4 | 1 | 7 | 11 | 13 | 8 | 12 | 14 |

Appendix 2

Appendix 2: Raw mussel data associated with freshwater mussels collected in Brushy Fork at the County Road 760N (TR 218) bridge, Douglas County, Illinois, by INHS personnel on 12 August 2020. Data collected: Transect = transect number (ph = person hour); MM=total length in mm of mussel; GRC=external growth ring count; Sex=Sex of mussel (if determinable); bed=bedrock, bld=boulder, cob=cobble, grav=gravel. Veg coverage =% of transect covered with Japanese knotweed. SE= Illinois endangered

| Transect | Species | MM | GRC | sex | bed | bld | cob | grav | sand | silt | clay | veg coverage | max depth | width (ft) |
|----------|-----------------------------|-----|-----|-----|-----|-----|-----|------|------|------|------|--------------|-----------|------------|
| 1 | none | | | | 0 | 0 | 30 | 20 | 50 | 0 | 0 | 0 | 2 | 24.53 |
| 6 | <i>Amblema plicata</i> | 76 | 12 | | 0 | 0 | 40 | 30 | 30 | 0 | 0 | 5 | 2.5 | 22.63 |
| 9 | none | | | | 0 | 0 | 30 | 40 | 30 | 0 | 0 | 5 | 2.5 | 17.32 |
| 11 | none | | | | 0 | 0 | 10 | 40 | 40 | 10 | 0 | 5 | 2.5 | 19.16 |
| 15 | <i>Toxolasma lividum</i> SE | 36 | 6 | M | 0 | 0 | 15 | 15 | 30 | 35 | 5 | 25 | 2 | 41.98 |
| 19 | <i>Amblema plicata</i> | 105 | 13 | | 0 | 0 | 20 | 20 | 50 | 5 | 5 | 5 | 2 | 44.12 |
| 19 | <i>Lampsilis hydiana</i> | 66 | 8 | F | | | | | | | | | | |
| 19 | <i>Lampsilis hydiana</i> | 50 | 6 | F | | | | | | | | | | |
| 19 | <i>Fusconaia flava</i> | 51 | 9 | | | | | | | | | | | |
| 24 | none | | | | 10 | 0 | 0 | 10 | 60 | 5 | 5 | 5 | 2.5 | 64.22 |
| 30 | none | | | | 5 | 10 | 0 | 30 | 40 | 10 | 5 | 0 | 3.5 | 93.64 |
| 32 | none | | | | 10 | 0 | 0 | 0 | 70 | 20 | 0 | 0 | 3 | 94.63 |
| 34 | none | | | | 10 | 0 | 0 | 0 | 70 | 20 | 0 | 0 | 3 | 94.63 |
| 37 | none | | | | 0 | 0 | 10 | 20 | 60 | 10 | 0 | 20 | 3 | 67.08 |
| 40 | none | | | | 0 | 0 | 10 | 20 | 50 | 20 | 0 | 15 | 3 | 72.68 |
| 42 | none | | | | 0 | 0 | 10 | 20 | 60 | 10 | 0 | 10 | 3 | 73.64 |
| 47 | none | | | | 0 | 0 | 10 | 10 | 75 | 5 | 0 | 5 | 3 | 27.75 |
| 49 | none | | | | 0 | 0 | 0 | 10 | 75 | 15 | 0 | 5 | 3 | 38.80 |
| 1 ph | none | | | | | | | | | | | | | |
| 2 ph | <i>Toxolasma lividum</i> SE | 26 | 5 | F | | | | | | | | | | |
| 2 ph | <i>Pleurobema sintoxia</i> | 77 | 14 | | | | | | | | | | | |
| 3 ph | none | | | | | | | | | | | | | |
| 4 ph | none | | | | | | | | | | | | | |

Table 1. List of fish species and number of individuals collected in Brushy Fork at the County Road 760N (IDOT TR 218) bridge, 3.5 mi WSW Newman, Douglas County, Illinois (Latitude 39.76342° North, Longitude 88.05267° West) by INHS personnel on 15 July 2020.

| Family | Scientific name | Common name | # individ |
|-----------------------------|--------------------------------|------------------------------|--------------------|
| Cyprinidae | <i>Cyprinella spiloptera</i> | Spotfin Shiner | 32 |
| | <i>Luxilus chrysocephalus</i> | Striped Shiner | 2 |
| | <i>Lythrurus fumeus</i> | Ribbon Shiner | 78 |
| | <i>Lythrurus umbratilis</i> | Redfin Shiner | 41 |
| | <i>Nocomis biguttatus</i> | Hornyhead Chub | 9 |
| | <i>Notemigonus crysoleucas</i> | Golden Shiner | 1 |
| | <i>Notropis stramineus</i> | Sand Shiner | 17 |
| | <i>Pimephales notatus</i> | Bluntnose Minnow | 39 |
| | Catostomidae | <i>Hypentelium nigricans</i> | Northern Hogsucker |
| <i>Minytrema melanops</i> | | Spotted Sucker | 18 |
| <i>Moxostoma erythrurum</i> | | Golden Redhorse | 2 |
| Fundulidae | <i>Fundulus notatus</i> | Blackstripe Topminnow | 3 |
| Centrarchidae | <i>Lepomis cyanellus</i> | Green Sunfish | 1 |
| | <i>Lepomis megalotis</i> | Longear Sunfish | 11 |
| Percidae | <i>Etheostoma blennioides</i> | Greensided Darter | 57 |
| | <i>Etheostoma caeruleum</i> | Rainbow Darter | 5 |
| | <i>Etheostoma nigrum</i> | Johnny Darter | 2 |
| | <i>Percina sciera</i> | Dusky Darter | 4 |

Biological Survey Data - Fish



Illinois Department of Transportation

Memorandum

To: Greg S. Lupton Attn: Doug DeLong
From: Jack A. Elston By: Thomas C. Brooks
Subject: Natural Resources Review-Update
Date: December 4, 2020 *Thomas C. Brooks*

TR 218
Section 07-08119-01-EG
T15N/R10E/S11
Douglas County
Seq. #15848

The proposed project involves removal and replacement of SN 021-4801 carrying TR 218 over Brushy Fork Creek. The replacement will occur along the existing road alignment. The north approach roadway will be re-aligned to eliminate a sharp curve in the road. The new north approach will also result in a better alignment at the intersection with CR 2225. The south approach profile will be raised to eliminate over-the-road flow. This 1223' long roadway improvement will involve channel excavation in the vicinity of the bridge, placement of riprap, and construction of roadway ditches. This project will require removal of 74 trees with in-stream work in Brushy Fork. The current land use is a wooded riparian corridor with adjacent row crop fields.

Review for Illinois Endangered Species Protection and Illinois Natural Areas Preservation – Part 1075

The Illinois Natural Heritage Database contains multiple records of State-listed fish and mussels within the limits of the proposed improvement. Field biologist surveyed for fish and mussels. The survey results yielded one state listed mussel, the Purple Liliput. We consulted with the IDNR and they recommended the IDOT obtain authorization for the potential incidental taking of the species. By copy of this memorandum, we are notifying the IDNR of IDOT's commitment to obtain incidental taking authorization.

Per IDOT policy, the incidental taking authorization must be in place prior to awarding the contract for the work that will cause the incidental taking. This project is clear for design approval only. IDOT policy and procedures for obtaining an incidental taking authorization are detailed in the Bureau of Design and Environment Manual at 26.06(h). The first step in obtaining incidental taking authorization is to prepare a Conservation Plan. This office is available to provide information and technical assistance as needed in preparing the Conservation Plan. Please note that the regulations for obtaining an incidental taking authorization allow 150 days for processing.

, Illinois Natural Area Inventory sites, dedicated Illinois Nature Preserves, or registered Land and Water Reserves in the vicinity of the project location. **Therefore, consultation under Part 1075 is terminated.**

This review for compliance with 17 Ill. Adm. Code Part 1075 is valid for two years unless new information becomes available that was not previously considered; the proposed improvement is modified; or additional species, essential habitat, or Natural Areas are identified in the vicinity. If the proposed improvement has not been implemented within two years of the date of this memorandum, or any of the above listed conditions develop, a new review will be necessary.

Review for Illinois Interagency Wetland Policy Act – Part 1090

A WIE has been previously submitted on 11/24/2010 and the impacts to wetlands have been accumulated at the district level. No further coordination is required. This project is cleared for construction with respect to wetlands. **Therefore, the wetland review under Part 1090 is terminated.**

Review for Endangered Species Act - Section 7

The proposed improvement was reviewed in fulfillment of our obligation under Section 7(a)2 of the Endangered Species Act. Our review included use of the US Fish and Wildlife Service's (USFWS) Information for Planning and Conservation (IPaC) web-based review tool. Through IPaC, an official species list was generated. The list contains the endangered, threatened, proposed and candidate species and proposed and designated critical habitat that may be present within or in the vicinity of the proposed improvement. The following species are listed: Indiana bat (Ibat), northern long-eared bat (NLEB) and snuffbox mussel. No proposed or designated critical habitat is listed. Under 50 CFR 402.12(e), **the accuracy of the species list is limited to 90 days.**

Within IPaC there is the NLEB-Ibat determination key. We used the key to determine applicability of the project with the USFWS revised programmatic biological opinion for transportation projects dated 02-05-2018 and to assess what effect the project would have on NLEB or Ibat. We completed an IPaC qualification interview and determined that the project is within the scope of the programmatic biological opinion. The project has gone through informal consultation and is not likely to adversely affect the NLEB or Ibat provided the following conservation measure is implemented by the project sponsor: **trees three (3) inches or greater in diameter at breast height will not be cleared April 1 through September 30. Please note that the bridge/structure assessment that was conducted for this project is valid for two years and that an expired assessment will need to be updated prior to construction.**

Should the proposed improvement be modified or new information indicate listed or proposed species may be affected, consultation or additional coordination should be initiated.

VH



Illinois Department of Natural Resources

One Natural Resources Way Springfield, Illinois 62702-1271
www.dnr.illinois.gov

JB Pritzker, Governor
Colleen Callahan, Director

3 December 2020

Vince Hamer
IDOT-BDE-Central Office
Natural Resources Survey Coordinator
2300 South Dirksen Parkway
Springfield, IL 62764

**RE: 15848-Douglas County TR 218 over Brushy Fork
Consultation Program
EcoCAT Review #2107555
Douglas County**

Dear Mr. Hamer:

The Department has received your submission for this project for the purposes of consultation pursuant to the *Illinois Endangered Species Protection Act* [520 ILCS 10/11], the *Illinois Natural Areas Preservation Act* [525 ILCS 30/17], and Title 17 *Illinois Administrative Code* Part 860 and Part 1075. Additionally, the Department may offer advice and recommendations for species covered under the *Fish & Aquatic Life Code* [515 ILCS 5, *et seq.*]; the *Illinois Wildlife Code* [520 ILCS 5, *et seq.*]; and the *Herptiles-Herps Act* [510 ILCS 69].

The proposed action being reviewed is the reconstruction of a the bridge carrying TR 218 over the Brushy Fork in Douglas County, Illinois. The proposed bridge will be constructed along the existing road alignment. This 1223 foot long roadway improvement will involve channel excavation in the vicinity of the bridge, placement of riprap, and construction of roadway ditches.

The mussel survey was completed by the Illinois Natural History Survey (INHS) on 12 August 2020. During the survey, 8 live mussels representing 5 species were collected by INHS personnel from the project area, including two state-listed purple lilliput (*Toxolasma lividum*). Therefore, the Department recommends the applicant seek an Incidental Take Authorization (ITA) pursuant to Part 1080 and Section 5.5 of the *Illinois Endangered Species Protection Act* for the purple lilliput. All questions pertaining to ITA should be directed to the ITA coordinator, Heather Osborn (Heather.Osborn@Illinois.gov).

Consultation on the part of the Department is closed, unless the applicant desires additional information or advice related to this proposal. Consultation for Part 1075 is valid for two years unless new information becomes available which was not previously considered; the proposed action is modified; or additional species, essential habitat, or Natural Areas are identified in the

vicinity. If the action has not been implemented within two years of the date of this letter, or any of the above listed conditions develop, a new consultation is necessary.

The natural resource review reflects the information existing in the Illinois Natural Heritage Database at the time of the project submittal and should not be regarded as a final statement on the project being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are unexpectedly encountered during the project's implementation, the applicant must comply with the applicable statutes and regulations.

Please contact me with any questions about this review.

Sincerely,

A handwritten signature in cursive script that reads "Bradley Hayes".

Bradley Hayes
Resource Planner
Office of Realty & Capital Planning
Illinois Dept. of Natural Resources
One Natural Resources Way
Springfield, IL 62702-1271
Bradley.Hayes@illinois.gov
Phone: (217) 782-0031

cc. Heather Osborn-Incidental Take Authorization Coordinator

Cummins Engineering Corporation

135 West Lake Shore Drive
Springfield, Illinois 62703
Phone: 217-726-8570

District Engineer
Department of the Army
Louisville District, Corps of Engineers
P.O. Box 59
Louisville, KY 40201

June 26, 2020

Attention: Regulatory Branch

**Subject: File LRL-2010-420-dah
Nationwide Permit Re-authorization Request
Douglas County, Illinois
TR 218 over Brushy Fork
Section 07-08119-01-BR
Proposed S.N. 021-4825**

Dear Sir:

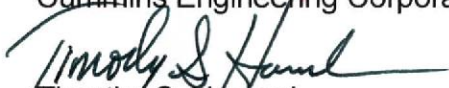
This project is currently being updated for letting. The Nationwide 14 authorization for this project expired on March 18, 2012 due to the expiration of all nationwide permits. On behalf of Mr. James Crane, Douglas County Engineer, we are submitting this application for re-authorization under the new nationwide permit program and respectfully request your concurrence that an individual 404 Permit will not be required for the above captioned project. The existing structure will be completely replaced with a new three-span precast prestressed concrete deck beam bridge. The scope is the same, total bridge replacement of the existing structure. See attached Plan and Profile Drawings.

The original Nationwide 14 Corp Permit dated 11/9/2011 has expired and is attached for reference. The environmental clearances obtained in 2011 are being reviewed by IDOT and are being renewed as required through IDOT's Bureau of Design and Environment.

Enclosed for your information is a prior authorization letter, a location map, a copy of the Preliminary Bridge Design and Hydraulic Report, environmental clearances, Plan and Profile drawings of the proposed project.

If we may be of further assistance in this matter, please feel free to contact this office at any time.

Very truly yours,
Cummins Engineering Corporation


Timothy S. Howard

Enclosures

Cc: Mr. James Crane, County Engineer
File No. 2253.2



DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
REGULATORY BRANCH, WEST SECTION
P.O. Box 489
NEWBURGH, INDIANA 47629-0489
FAX: (812) 858-2678
<http://www.lrl.usace.army.mil>

RECEIVED
11/16/11
2253

November 9, 2011

Operations Division
Regulatory Branch (West)
ID No. LRL-2010-420-dah

James Crane
Douglas County Highway Department
200 South Prairie
Tuscola, IL 61953

Dear Mr. Crane:

This is in response to your request for authorization to replace an existing bridge with a three (3) span deck beam bridge on spill-thru abutments for the TR 218 crossing over Brushy Fork, approximately 4 miles southwest of Newman, Douglas County, Illinois. The information supplied by you was reviewed to determine whether a Department of the Army (DA) permit will be required under the provisions of Section 404 of the Clean Water Act.

Your project is considered a discharge of fill for a road crossing. The project is authorized under the provisions of 33 CFR 330 Nationwide Permit (NWP) No. 14, Linear Transportation Projects, as published in the Federal Register March 12, 2007. Under the provisions of this authorization you must comply with the enclosed:

1. Terms for Nationwide Permit No. 14
2. Nationwide Permit General Conditions
3. Water quality certification conditions issued by the Illinois Environmental Protection Agency.

This verification is valid until the NWP is modified, reissued, or revoked. All of the existing NWPs are scheduled to be modified, reissued, or revoked prior to **March 18, 2012**. It is incumbent upon you to remain informed of changes to the NWPs. We will issue a public notice when the NWPs are reissued. Furthermore, if you commence or are under contract to commence this activity before the date that the relevant nationwide permit is modified or revoked, you will have twelve (12) months from the date of the modification or revocation of the NWP to complete the activity under the present terms and conditions of this nationwide permit.

The enclosed Compliance Certification should be signed and returned when the project is completed. If your project is not completed within this timeframe or if your project is modified, you must contact us for another permit determination. A copy of this letter is being sent to your agent and to the

RECEIVED
ILEPA.

If you have any questions, please contact this office by writing to the above address, ATTN: CELRL-OP-FW, or by calling me at 812.842.0250. All correspondence pertaining to this matter should refer to our ID No. LRL-2010-420-dah

Sincerely,

ORIGINAL SIGNED

Devetta Hill
Project Manager
Regulatory Branch

Enclosures

dah/FW/nw14-IL.doc

ADDRESS FOR COORDINATING AGENCY

Illinois Environmental Protection Agency
Bureau of Water
Attn: James Allison
Watershed Management Section #15
P.O. Box 19276
Springfield, IL 62794-9276

ADDRESS FOR AUTHORIZED AGENT

Michael D. Cummins
Cummins Engineering Corporation
615 South Fifth Street
Springfield, IL 62703

**Survey for Freshwater Mussels in Brushy Fork
(Embarras River Basin) at the County Road
760N (TR 218) Bridge in Douglas County, Illinois**

IDOT Sequence Number 15848



Prepared by:
Alison P. Stodola

INHS/IDOT Statewide Biological Survey & Assessment Program
2020:80

19 November 2020



PROJECT SUMMARY

This report is submitted in response to a request from the Illinois Department of Natural Resources (IDOT) to the Illinois Natural History Survey (INHS) for a freshwater mussel survey in Brushy Fork (Embarras River basin) at the County Road 760N (TR 218) bridge (IDOT Structure No. 021-4801; IDOT Sequence No. 15848) in Douglas County, Illinois. The mussel survey was conducted by INHS personnel on 12 August 2020.

During this survey, freshwater mussels were collected by hand-picking and visual sampling along 15 randomly assigned transects and during a supplemental qualitative timed search in the area of direct impact and adjacent buffer by INHS personnel on 12 August 2020. In the survey area at County Road 760N (TR 218), five species of mussels were collected live and seven species were collected as dead or relict shell. Live mussels included Purple Lilliput (*Toxolasma lividum*), which is listed as endangered in Illinois.



Approved By: Kevin S. Cummings, Further Studies Aquatics
Group Coordinator-Malacologist

Surveys Conducted By: Alison P. Stodola, Assistant Aquatic Field Biologist
Rachel M. Vinsel, Senior Scientific Specialist
Kathryn E. Conatser, Field Assistant

Report Edited By: Mark J. Wetzel

GIS Layers: Janet L. Jarvis, GIS and Remote Sensing Specialist

University of Illinois
Prairie Research Institute
Illinois Natural History Survey
Statewide Biological Survey and Assessment Program
1816 South Oak Street
Champaign, Illinois 61820

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Cover Photo: Brushy Fork at the County Road 760N (TR 218) bridge (Structure Number 021-4801), Douglas County, Illinois (Latitude 39.76342°N, Longitude 88.05265°W). Photo was taken from downstream (southwest) of the bridge, facing upstream (northeast), on 12 August 2020. Photo by A.P. Stodola, INHS.

INTRODUCTION

This report is submitted in response to a request on 29 June 2020 by Vincent Hamer of the Illinois Department of Transportation (IDOT) to Rachel Vinsel of the Illinois Natural History Survey (INHS) for a freshwater mussel survey in Brushy Fork at the County Road 760N (TR 218) bridge (IDOT Structure No. 021-4801; Section No. 07-08119-01-EG) in Douglas County, Illinois (IDOT Sequence No. 15848, INHS Project No. FS-1475). IDOT inquired to INHS about the status of mussels in Brushy Fork because Douglas County highway department proposes a new bridge to be constructed at Latitude 39.76342°N, Longitude 88.05265°W. The proposal includes re-alignment of the north approach roadway to eliminate a sharp curve in the road, as well as raising the south approach profile to eliminate over-the-road water flow. The roadway improvement will involve channel excavation in the vicinity of the new bridge, placement of riprap, construction of roadway ditches, as well as removal of small scrub trees along the south approach embankment. The new proposed Structure Number will be 021-4825, as the existing bridge (Structure No. 021-4801) is not open to traffic at this time.

In this report, we summarize the results of the freshwater mussel survey conducted in Brushy Fork at the County Road 760N (TR 218) bridge by INHS personnel on 12 August 2020.

PROJECT AREA

The County Road 760N (TR 218) bridge project (IDOT Structure No. 021-4801; Section No. 07-08119-01-EG; IDOT Sequence No. 15848) is located on the Murdock U.S.G.S. Quadrangle Topographic map and is 4.25 miles SW Newman in Douglas County, Illinois – in Township 15N, Range 10E, Section 11, at Latitude 39.76342°N, Longitude 88.05265°W (**Figure 1**).

Appendix 1 references an Arc-GIS shapefile with sampling point information for the freshwater mussel survey at the stream bridge discussed in this report.

HABITAT CHARACTERIZATION

Brushy Fork at the County Road 760N (TR 218) bridge was approximately 53 feet (range 17 – 94 ft) wide and averaged 1.5 feet deep (range 0 – 3.5 ft). Brushy Fork at this location had defined riffle-run-pool segments and the area directly under the County Road 760N bridge was a shallow slow-flowing water and pool habitat. Stream flow was approximately 0.75 ft/sec in areas with flowing water. Substrate was primarily sand (53%), but bedrock (2%), boulder (1%), cobble (12%), gravel (19%), silt (11%), and clay (2%) substrates were also present. Woody debris were present throughout the project area in the form of decayed fallen timber that had accumulated along the existing bridge pylons (**Figure 2**) as well as newly-fallen trees along the stream edge. Favorable habitat for freshwater mussels was present throughout the site. The stream edges and shallow areas were dominated by Japanese Knotweed (*Polygonum cuspidatum*), a noxious invasive weed (see **Appendix 2** for percent coverage of transects). The immediate riparian area was forested, with row-crop agriculture as the dominant land-use beyond the stream corridor.

BACKGROUND

Brushy Fork is a tributary of the Embarras River in east-central Illinois. Brushy Fork rises near Newman in Douglas County, Illinois, and flows southwest for approximately 8 miles before it

joins the Embarras River. The confluence of Brushy Fork with the Embarras River is less than 5 river miles downstream (south-southwest) of the current survey site at the County Road 760N (TR 218) bridge.

Prior to this present survey, 23 mussel species had been recorded from Brushy Fork of the Embarras River, including Illinois Endangered Kidneyshell (*Ptychobranchnus fasciolaris*) and Purple Lilliput (*Toxolasma lividum*) (**Table 1**; INHS Mollusk Collections Data 2020; Illinois Endangered Species Protection Act [IESPA] 2020). Both Kidneyshell and Purple Lilliput were collected alive from the County Road 760N bridge area in a survey in 2011, and Purple Lilliput have been collected at two other Brushy Fork locations (**Table 1**). All other species collected are common inhabitants of central Illinois streams (Cummings and Mayer 1992; Cummings and Mayer 1997; Tiemann et al. 2007). This reach of Brushy Fork is also within the Newman Reach as both a Category II and VI site on the Illinois Natural Areas Inventory (INAI) by the Illinois Department of Natural Resources (IDNR) Division of Natural Heritage due to presence of specific suitable habitat for state-listed species and an unusual concentration of Flora and Fauna (IDNR 2013; INAI 2018).

Kidneyshell are found in medium to large rivers in gravel and are typically found in moderately strong currents in coarse gravel and sand substrates. In Illinois, reproducing populations are known only in the Embarras drainage, and critically small populations may still be present in the Vermilion-Wabash drainage (Douglass and Stodola 2014).

Purple Lilliput are small mussels (<2 inches long) that are found in small to medium rivers in slow to swift currents among mud, sand, and gravel substrates. INHS biologists (Douglass and Stodola 2014) recently determined through targeted collections that most individuals were found along stream edges, particularly in fine sediments. They are found in the Vermilion-Wabash, Embarras, and Big Creek (of Ohio River) drainages in Illinois (Douglass and Stodola 2014).

METHODS

A survey for freshwater mussels was conducted in Brushy Fork at the County Road 760N (TR 218) bridge (Structure No. 021-4801) by INHS personnel A.P. Stodola, R.M. Vinsel, and K.E. Conatser on 12 August 2020. During this survey, live mussels were sampled using transects as well as a timed qualitative survey.

To estimate densities of mussels within the project area, strip transects running perpendicular to the flow of the river were randomly distributed along the length of the area of possible impact. Due to the unknown extent of future instream work and impact in the stream, we used best professional judgement to establish the survey area. Fifteen transects were randomly assigned and ordered within a reach of stream 164 feet long, centered upon the existing bridge. Mussels were sampled within each transect using tactile and visual search methods. Substrates were disturbed to a depth of approximately 1.5 inches (4 cm) to uncover buried mussels and transects were searched at a rate that did not exceed 1 minute/10 ft² (1 min/m²). Transects were surveyed from downstream-most to upstream-most transect, and a total of 15 transects were surveyed. At each transect, mussels were collected, identified, measured to total length, external growth rings were enumerated, and transect width, depth, and substrate were recorded (**Appendix 2**).

Following the transect sampling, live mussels were surveyed by hand grabbing and visual detection (e.g., trails, siphons, exposed shell) in areas within and adjacent to the assumed project area. Efforts were made to search all available habitat types present within the project area. Personnel sampled for an additional 4 person-hours over approximately 200 yards of the stream (**Figure 1**). All mussels collected were identified, measured to nearest mm, external growth rings were enumerated. Mussels listed as threatened or endangered on the Illinois Endangered Species List (IESPA 2020) were returned to the approximate locations they were collected, and species not under legal protection at the state or federal level were relocated to an area approximately 200 feet downstream (southwest) of the County Road 760N (TR 218) bridge.

Nomenclature used for freshwater mussels discussed in this report follows Williams et al. (2017). The current statuses of threatened and endangered species discussed in this report are taken from the Illinois Endangered Species Protection Act (IESPA 2020). Voucher material of mollusks collected were deposited in the Illinois Natural History Mollusk Collection in Champaign and cataloged as INHS 91028 through 91034.

RESULTS AND DISCUSSION

On 12 August 2020, five species of freshwater mussels were collected alive and seven other species were collected as dead or relict shell by INHS personnel from Brushy Fork in the area surveyed at the County Road 760N (TR 218; Structure No. 021-4801) bridge (**Table 1; Figure 3**). The live species included Illinois endangered Purple Lilliput (n=2); one Purple Lilliput was collected during transect sampling (in transect 15, which was approximately 32 feet upstream [northeast] of the midpoint of the County Road 760N bridge), and one Purple Lilliput was collected from within the presumed project area during the qualitative timed search. The remaining species collected are common inhabitants of Illinois streams (Cummings and Mayer 1992; Cummings and Mayer 1997; Tiemann et al. 2007).

ACKNOWLEDGMENTS

INHS employees Rachel M. Vinsel and Kathryn E. Conatser assisted with the field survey. Janet L. Jarvis (INHS) prepared the map in **Figure 1** and the associated shape file referenced in **Appendix 1**, and Mark J. Wetzel edited early drafts of the report.

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Table 1. Summary of freshwater mussels recorded from Brushy Fork in Douglas County, Illinois (INHS Mollusk Collections Data 2020). Mussels collected from Brushy Fork at the County Road 760N (TR 218) bridge by INHS personnel on 12 August 2020 are outlined by a black border. Sites are arranged left to right from upstream-most to downstream-most survey location within Brushy Fork. **SE** = Illinois Endangered.

| | County Road | 2780E | 2510E | 800N | ----2300E---- | | -----760N----- | | | | 600N | |
|--------------------------------------|---------------------------|------------|-----------|-----------|---------------|----------|----------------|-----------|------------|----------|-----------|-----------|
| | Year Surveyed | 2012 | 2014 | 2014 | 1996 | 1997 | 1997 | 2001 | 2011 | 2012 | 2020 | 2009 |
| <i>Alasmidonta marginata</i> | Elktoe | | | | | | | | | | | 1 |
| <i>Amblema plicata</i> | Threeridge | 27 | 7 | 16 | | relict | relict | 43 | 81 | dead | 2 | 11 |
| <i>Anodontoides ferussacianus</i> | Cylindrical Papershell | 5 | | | | | relict | relict | | | | |
| <i>Cyclonaias pustulosa</i> | Pimpleback | | 1 | | | | | | | | | |
| <i>Fusconaia flava</i> | Wabash Pigtoe | 21 | 14 | 6 | dead | | dead | 7 | 11 | dead | 1 | 5 |
| <i>Lampsilis cardium</i> | Plain Pocketbook | 4 | 3 | dead | relict | | | dead | 4 | | relict | relict |
| <i>Lampsilis hydiana</i> | Louisiana Fatmucket | 15 | 14 | 2 | dead | | dead | 7 | 9 | | 2 | 1 |
| <i>Lasmigona complanata</i> | White Heelsplitter | 20 | 2 | | | | | relict | 2 | | | 3 |
| <i>Lasmigona compressa</i> | Creek Heelsplitter | | | dead | | | | | | relict | | |
| <i>Lasmigona costata</i> | Flutedshell | | | | | | | | | relict | | |
| <i>Leptodea fragilis</i> | Fragile Papershell | 12 | 1 | dead | | | | | | | relict | 6 |
| <i>Pleurobema sintoxia</i> | Round Pigtoe | | | | | | | 1 | 4 | dead | 1 | 8 |
| <i>Ptychobranchus fasciolaris SE</i> | Kidneyshell | | | | | | | | 1 | | | |
| <i>Pyganodon grandis</i> | Giant Floater | 51 | 24 | 2 | dead | | relict | dead | 2 | | relict | 2 |
| <i>Quadrula quadrula</i> | Mapleleaf | 1 | | | | | relict | | | | | 1 |
| <i>Strophitus undulatus</i> | Creeper | 1 | 1 | dead | | | relict | dead | dead | dead | relict | 2 |
| <i>Toxolasma lividum SE</i> | Purple Lilliput | | | 3 | | | | relict | 1 | dead | 2 | 2 |
| <i>Toxolasma parvum</i> | Lilliput | 2 | 7 | | | | | | relict | | | |
| <i>Tritogonia verrucosa</i> | Pistolgrip | | | 1 | | | | | 6 | | dead | relict |
| <i>Truncilla truncata</i> | Deertoe | dead | dead | | | | | | | | | |
| <i>Uniomerus tetralasmus</i> | Pondhorn | relict | | | | | | | | | dead | |
| <i>Utterbackia imbecillis</i> | Paper Pondshell | | 1 | | | | | | | | | |
| <i>Villosa lienosa</i> | Little Spectaclecase | 6 | 1 | 2 | | | | dead | 2 | relict | relict | dead |
| | Total Individuals | 165 | 76 | 32 | 0 | 0 | 0 | 58 | 123 | 0 | 8 | 42 |
| | Total Live Species | 12 | 12 | 7 | 0 | 0 | 0 | 4 | 11 | 0 | 5 | 11 |
| | Total Species | 14 | 13 | 11 | 4 | 1 | 7 | 11 | 13 | 8 | 12 | 14 |



Mussel survey location on Brushy Fork near TR 218 (Sequence no. 15848) Douglas County, Illinois.

- Project Boundary
- Mussel Survey Location
- Stream
- Mussel Relocation Area

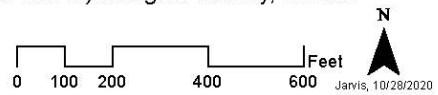


Figure 1. Brushy Fork project site (IDOT Sequence No. 15848) at the County Road 760N (TR 218) bridge (Structure No. 021-4801) in Douglas County, Illinois, where a survey for freshwater mussels was conducted by INHS personnel on 12 August 2020.



Figure 2. Woody debris accumulating along pylons of existing County Road 760N bridge (IDOT Structure No. 021-4801) over Brushy Fork in Douglas County, Illinois, on 12 August 2020. Image was taken during a survey for freshwater mussels from the north bank, facing south. Photo by A.P. Stodola, INHS.



Figure 3. Representative mussels collected from Brushy Fork at the County Road 760N (TR 218) bridge in Douglas County, Illinois, by INHS personnel on 12 August 2020. Clockwise from top left: Threeridge, Louisiana Fatmucket (top – female, bottom – male), Wabash Pigtoe, Round Pigtoe, Purple Lilliput (left – male, right – female). Photos by R.M. Vinsel, INHS.

Appendix 1

Appendix 1 references an ArcGIS shapefile < 15848_Mussel_Survey_GIS.zip > with sampling point information for the stream bridge of Brushy Fork at the County Road 760N (TR 218) bridge (IDOT Sequence No. 15848; Structure No. 021-4801), Douglas County, Illinois (Latitude 39.76342°N, Longitude 88.05265°W), where a survey for freshwater mussels was conducted by INHS personnel on 12 August 2020.

The ArcGIS shapefile and this report were both submitted to IDOT via the IDOT Site Assessment Tracking System extranet website (Frostycap) on 19 November 2020.

Appendix 2

Appendix 2: Raw mussel data associated with freshwater mussels collected in Brushy Fork at the County Road 760N (TR 218) bridge, Douglas County, Illinois, by INHS personnel on 12 August 2020. Data collected: Transect = transect number (ph = person hour); MM=total length in mm of mussel; GRC=external growth ring count; Sex=Sex of mussel (if determinable); bed=bedrock, bld=boulder, cob=cobble, grav=gravel. Veg coverage =% of transect covered with Japanese knotweed. SE= Illinois endangered

| Transect | Species | MM | GRC | sex | bed | bld | cob | grav | sand | silt | clay | veg coverage | max depth | width (ft) |
|----------|-----------------------------|-----|-----|-----|-----|-----|-----|------|------|------|------|--------------|-----------|------------|
| 1 | none | | | | 0 | 0 | 30 | 20 | 50 | 0 | 0 | 0 | 2 | 24.53 |
| 6 | <i>Amblema plicata</i> | 76 | 12 | | 0 | 0 | 40 | 30 | 30 | 0 | 0 | 5 | 2.5 | 22.63 |
| 9 | none | | | | 0 | 0 | 30 | 40 | 30 | 0 | 0 | 5 | 2.5 | 17.32 |
| 11 | none | | | | 0 | 0 | 10 | 40 | 40 | 10 | 0 | 5 | 2.5 | 19.16 |
| 15 | <i>Toxolasma lividum</i> SE | 36 | 6 | M | 0 | 0 | 15 | 15 | 30 | 35 | 5 | 25 | 2 | 41.98 |
| 19 | <i>Amblema plicata</i> | 105 | 13 | | 0 | 0 | 20 | 20 | 50 | 5 | 5 | 5 | 2 | 44.12 |
| 19 | <i>Lampsilis hydiana</i> | 66 | 8 | F | | | | | | | | | | |
| 19 | <i>Lampsilis hydiana</i> | 50 | 6 | F | | | | | | | | | | |
| 19 | <i>Fusconaia flava</i> | 51 | 9 | | | | | | | | | | | |
| 24 | none | | | | 10 | 0 | 0 | 10 | 60 | 5 | 5 | 5 | 2.5 | 64.22 |
| 30 | none | | | | 5 | 10 | 0 | 30 | 40 | 10 | 5 | 0 | 3.5 | 93.64 |
| 32 | none | | | | 10 | 0 | 0 | 0 | 70 | 20 | 0 | 0 | 3 | 94.63 |
| 34 | none | | | | 10 | 0 | 0 | 0 | 70 | 20 | 0 | 0 | 3 | 94.63 |
| 37 | none | | | | 0 | 0 | 10 | 20 | 60 | 10 | 0 | 20 | 3 | 67.08 |
| 40 | none | | | | 0 | 0 | 10 | 20 | 50 | 20 | 0 | 15 | 3 | 72.68 |
| 42 | none | | | | 0 | 0 | 10 | 20 | 60 | 10 | 0 | 10 | 3 | 73.64 |
| 47 | none | | | | 0 | 0 | 10 | 10 | 75 | 5 | 0 | 5 | 3 | 27.75 |
| 49 | none | | | | 0 | 0 | 0 | 10 | 75 | 15 | 0 | 5 | 3 | 38.80 |
| 1 ph | none | | | | | | | | | | | | | |
| 2 ph | <i>Toxolasma lividum</i> SE | 26 | 5 | F | | | | | | | | | | |
| 2 ph | <i>Pleurobema sintoxia</i> | 77 | 14 | | | | | | | | | | | |
| 3 ph | none | | | | | | | | | | | | | |
| 4 ph | none | | | | | | | | | | | | | |