United States Department of the Interior

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February 10, 2016

Michael McFadden
Department of the Army
Kansas City District, Corps of Engineers
Missouri State Regulatory Program Office
515 East High Street, Suite 102
Jefferson City, Missouri 65101

Re: USACE Permit Number NWK-2014-01049
Enbridge (Ozark) L.L.C. Line 51 MP 243 Pipeline Replacement Project

Dear Mr. McFadden:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the above referenced pipeline replacement through the Niangua River channel in Dallas County, Missouri, and its effect on the federally endangered Niangua darter (*Etheostoma nianguae*) and its designated critical habitat in accordance with Section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Your request for formal consultation in was received on November 19, 2015.

This biological opinion is based on information provided in the November 2015 biological assessment, the project proposal, field investigations, telephone conversations, available literature, personal communications with species experts and other sources of information. A complete administrative record of this consultation is on file at this office.

We appreciate your cooperation in working with the Service to protect this endangered species. If you have any questions or concerns regarding this consultation and biological opinion, please feel free to contact me or Bryan Simmons of my staff at 417-836-5302.

Sincerely,

Amy Salveter
Field Supervisor

cc: USACE, Truman Satellite Office (Attn: Sean Beyke)

Enbridge Pipelines (Ozark) L.L.C.
Line 51 MP 243 Pipeline Replacement Project
Niangua River, Dallas County, Missouri

BIOLOGICAL OPINION

Submitted to the

U.S. Army Corps of Engineers
Kansas City District

by

U.S. Fish and Wildlife Service
Missouri Ecological Services Field Office

February, 2016

Table of Contents

INTRODUCTION

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion (BO) based on our review of the proposed Enbridge Pipelines [Ozark] L.L.C. (Enbridge) Niangua River Pipeline Replacement Project Line 51, Milepost 243 in Dallas County, Missouri. The proposal is to replace one section of petroleum pipeline on Line 51 and remove one section of petroleum pipeline on Line 53 all in Dallas County, Missouri. The proposed activities require a U.S. Army Corps of Engineers (USACE) Section 404 of the Clean Water Act (33 USC 1344) permit (USACE Permit Number NWK-2014-01049).

This BO evaluates potential and actual effects of the proposed work on the federally threatened Niangua darter (*Etheostoma nianguae*) and designated critical habitat in accordance with Section 7(a)(2) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

Section 7(a)(2) of the Act states that Federal agencies must ensure that their activities are not likely to:

- Jeopardize the continued existence of any listed species, or
- Result in the destruction or adverse modification of designated critical habitat.

Through informal consultation, the Service concurred with the USACE's determination that the project would not likely adversely affect the federally endangered Indiana Bat (*Myotis sodalis*), and federally threatened northern long-eared bat (*Myotis septentrionalis*).

On November 19, 2015, the Service accepted the USACE's Biological Assessment (BA) prepared by Barr Engineering Company (Barr) and request for formal consultation. The purpose of formal consultation, in part, is for the Service to 1) Identify the nature and extent of the project effects on listed species, 2) Identify avoidance and minimization measures, 3) Identify reasonable and prudent alternatives, 3) Provide an exception for specified levels of incidental take otherwise prohibited under Section 9 of the ESA, 4) Determine whether the action is likely to jeopardize the continued existence of the listed species, 5) Determine if the project will result in adverse modification to designated critical habitat, and 6) Develop a BO and Incidental Take Statement. The resulting BO provides that analysis, and lists measures to avoid and minimize adverse effects, including anticipated take, identified during consultation. A complete administrative record of this consultation is on file at the Service's Missouri Ecological Services Field Office in Columbia, Missouri (TAILS #03E14000-2016-F-0453).

The BO is based upon the project proposal, information provided in the November 2015 BA, subsequent correspondence, available literature, two field investigations, personal communications with Niangua darter experts, and other relevant materials regarding the current status of the species. The Service has determined that implementation of the project described in the BA will not jeopardize the continued existence of the Niangua darter or adversely modify its critical habitat, but will result in incidental take of the species. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct.

CONSULTATION HISTORY

April 2, 2014: Email from Barr to the Service requesting a phone call on April 8, 2014 to introduce the project and request Service input. Service responded by email and suggested inclusion of Missouri Department of Conservation (MDC) Niangua darter recovery biologist and policy coordination unit participation. Service emailed MDC regarding project information.

April 4, 2014: Email from MDC to Service and Barr indicating a schedule conflict for the phone call date and requested participation at a later date.

April 8, 2014: Phone call between Barr and the Service. Service explained the Section 7 process, the need for a BA and investigated the initial level of impact from project proposal. The Service suggested Barr contact the USACE and enter project information into the Service's Information for Planning and Conservation (IPaC) system.

October 2, 2014: Email from Barr to the Service requesting a phone call on October 6, 2014 to discuss BA details necessary for Section 7 consultation.

October 6, 2014: Phone call between Barr and the Service. Service explained the need for biological information within the BA necessary for the Service to produce a BO and clarified the BA would also have to be accepted by the USACE. The Service emailed Barr following this phone call to clarify the habitat evaluation needs for federally listed bats.

October 13, 2014: Email from Barr to Service requesting contact information for MDC Niangua darter expert for biological input.

October 15, 2014: Barr entered project details into the Service's IPaC system. An automated official Section 7 species list response was delivered to Barr on behalf of the Service (TAILS #03E14000-2015-SLI-0026).

October 17, 2014: Email from Service to Barr forwarding MDC Niangua darter expert contact information.

November 25, 2014: Email from Barr to the USACE, Service, and MDC to request a site visit on January 8, 2015 to evaluate the project and submitted recent site photographs dated March, September, and November 2014. The USACE, MDC and Service responded and provided an alternative January 6, 2015 date.

December 4 and 30, 2014: Email from Barr to Service, MDC, USACE and Enbridge confirming January 6, 2015 site visit.

January 6, 2015: USACE, Service, Barr, MDC, and Enbridge conducted a site visit. Project features, effects, and consultation process/information needs were discussed.

January 9, 2015: Email from MDC to Barr, Enbridge, USACE and the Service providing historical site photos indicating concrete mattress installation.

January 15, 2015: Barr forwarded email contact information from those in attendance at January 6, 2015 site visit.

January 27, 2015: Email from Barr to USACE, Service and MDC describing boring plans and attachment indicating locations necessary to discern bedrock depths below the river substrate necessary for project planning.

January 28, 2015: Email from USACE to MDC, Barr, and Service indicating the proposed boring activity is not a regulated activity by the USACE but suggested Barr contact Missouri Department of Natural Resources (DNR) and the Service for water quality concerns.

January 29, 2015: Email from Service to Barr in response to the January 27 correspondence clarifying the boring proposal must occur outside the wetted channel to not adversely affect the Niangua darter. Barr emailed confirmation that no boring would occur in the wet section of the Niangua River and that work would commence on February 4, 2015.

March 12, 2015: Email from Barr to Service requesting phone call to discuss modifications to original project proposal. A phone call was scheduled for March 16, 2015.

March 16, 2015: Phone call between Barr and the Service discussing project updates including design plans to temporarily dam the Niangua River and provide updates to project scheduling.

A**pril 1, 2015**: Barr submitted the project application to USACE. The Service conveyed the 2012 and 2014 MDC Niangua darter monitoring reports to the USACE and Barr for consideration.

A**pril 30, 2015**: USACE conveyed the April 2015 BA and formal consultation request to the Service.

May 12, 2015: Email from Service to USACE conveying comments regarding review of BA. The Service noted numerous deficiencies, clarifications and editorial needs and requested a retraction of formal consultation request and a continuation of informal consultation until an adequate BA is developed.

May 14, 2015: USACE withdrew the formal consultation request and relayed Service BA comments to Barr.

June 2, 2015: Email from Service to USACE requesting a status report on consultation.

July 6, 2015: Email from USACE to Service regarding project updates. It was conveyed that Enbridge is reevaluating the project with a new design team and developing a less damaging alternative to previous project description. This change involved use of an AquaDam (described in BO) vs. previous dam proposal described in April BA.

July 7, 2015: Email from Service to Barr conveying a weblink for USGS stream gauge downstream of project location to help infer flow data.

July 9, 2015: Email from Barr to USACE and Service requesting another site visit to discuss construction plan changes with new Enbridge design team scheduled for July 16, 2015 when the team planned to visit the site.

July 10, 2015: Email from Service to Barr confirming date, but subsequent email on July 13, 2015 from Barr to Service and USACE cancelled the site visit and plan for a future meeting date.

July 22, 2015: Email from Barr to USACE and Service requesting a call to discuss project. Service and USACE responded that July 24, 2014 was available.

July 24, 2015: Phone call held between Service, USACE and Barr discussing new design, construction methods, AquaDam, construction logistics, a phased construction approach and development and information needs in an amended BA and USACE permit application. Barr emailed a visual supplement to Service and USACE to aid the phone discussion.

July 27, 2015: Barr entered updated project details into IPaC. The Service delivered another automated official Section 7 species list (TAILS #03E14000-2015-SLI-0795).

August 14, 2015: Email from Barr to USACE and Service conveying a revised BA dated August, 2015.

August 17, 2015: Email from USACE to Barr requesting clarification on project elements not discussed in August BA.

August 21, 2015: Phone call held between Service and USACE discussing use of turbidity curtains added to the modified August 2015 BA that were not previously discussed.

August 24, 2015: Email from USACE to Service forwarding the August 17, 2015, clarification request to Barr regarding items not previously discussed in the amended BA.

September 2, 2015: Email from Barr to USACE and Service requesting a site visit in September to discuss BA and changes and re-evaluate stream and assess bat habitat. A field visit was scheduled for September 16, 2015.

September 8, 2015: Email from Barr to USACE and Service requesting a phone call with the USACE and Service regarding discussion points for September 16, 2015 site visit. The Service did not participate on the call.

September 16, 2015: Service, USACE, Enbridge, and Barr conducted a 2nd site visit to evaluate project changes, re-evaluate bat and Niangua darter habitat, and discuss plan modifications and scheduling conflicts. Enbridge requested the permit by November 5, 2015 to have adequate time to complete project prior to March 15th date restriction necessary for the Niangua darter spawning period. The Service and USACE conveyed the consultation timeline needed to construct, review, sign and distribute a BO would be extremely difficult in such a short timeline given a final date being dependent on sufficient information within an acceptable BA.

September 17, 2015: USACE and Service phone conversation regarding consultation in light of site visit including proper definition of Action Area and assessment of effects regarding the use of turbidity curtains and construction planning.

September 18, 2015: Email from USACE to Service summarizing the call on September 17 and a subsequent email from USACE to MDC requesting MDC availability for Niangua darter salvage operations during proposed construction phases.

September 22, 2015: Email from Barr to USACE clarifying the use of turbidity curtains and action area size. This correspondence was forwarded to the Service.

September 23, 2015: Email from USACE to Service requesting Service concurrence with a not likely to adversely affect (NLAA) determination for the Indiana bat and Northern long-eared bat and/or their critical habitat.

September 23, 2015: USACE conveyed a revised BA and formal consultation request to the Service.

September 23, 2015: Email from Barr to USACE and Service requesting a phone call to ascertain the permit and BO timeline to develop/coordinate construction timing. This phone call was planned for September 28, 2015.

September 28, 2015: Email from Service to USACE responding to the Sept 23rd email request with a concurrence to the USACE NLAA determination for the federally listed bats previously mentioned.

September 28, 2015: Service, USACE, Enbridge, and Barr conducted a phone call discussing project scheduling and proposed timeline for BO completion.

September 30, 2015: Service phoned USACE to discuss the Service's BA review. Specific discussion was made toward numerous suggested edits to the BA regarding remaining ambiguous details, project clarifications, amendments, additions and project scheduling. The Service stated a major revision was necessary to be acceptable enough to complete a BO. The Service also requested if Barr could submit their BA in a Microsoft Word document format so the Service could provide comments in track changes. The USACE emailed this request to Barr. Barr emailed the Word version of the BA to the USACE which was subsequently conveyed to the Service.

October 1, 2015: Email from Service to USACE conveying Service questions/comments to BA.

October 2, 2015: Email from USACE to Barr conveying both Service and USACE comments. The USACE included several listed items they felt also needed inclusion in the BA revision.

October 6, 2015: Email from Enbridge to USACE, Service and Barr requesting status update on BA review. USACE provided email response confirming Service review/response.

October 16, 2015: Barr emailed an updated BA (still dated August 2015) to Service and USACE and a construction timeline.

October 20, 2015: Email from USACE to Service stating Barr had addressed the comments from the Service and USACE and felt that the BA was sufficient to develop a BO and requested a call on October 23, 2015 to discuss.

October 23, 2015: USACE and Service phone call to discuss BA. The Service felt the BA should be a single complete document and should reflect and include the most current information resulting from recent informal consultation stated above to address all known effects to the Niangua darter. The Service identified numerous remaining issues/edits/clarifications necessary as well as consultation information submitted via emails that should be added within a final BA. The Service asked the USACE forward these comments to Barr and request all changes be reflected in a final BA draft.

October 23, 2015: Email from USACE to Barr stating that the Service and USACE had reviewed the updated August BA and the several additional comments stated above required clarification. The Service had specified to the USACE via phone that if Barr could make the necessary edits within the week and retitle the BA to reflect a current date (October xx, 2015), the Service would agree to using the original September 23rd formal consultation request date per the required 30-day review period to complete a BO within 135 days.

October 29, 2015: Email from Barr to USACE and Service requesting a conference call with USACE and Service to discuss comments toward final BA and introduce additional minor changes to the project. The call was arranged for November 2, 2015.

November 2, 2015: Phone call between Barr, USACE, Service and Enbridge discussion about the revised BA, potential plans to possibly reduce project scope by striking Line 53 removal plans. Enbridge also requested clarification regarding turbidity monitoring and Reinitiation threshold comments from the agencies.

November 18, 2015: Barr conveyed a final BA dated November, 2015 reflecting relevant updates, project changes and pertinent USFWS and USACE comments/edits.

November 19, 2015: USACE and Service reviewed the November BA for acceptance. Due to the disparity in time between BA drafts, the Service requested via phone and email that the USACE formal consultation initiation date reflect the November 19, 2015 date in which the final BA was submitted and accepted.

November 23, 2015: Service responded to the USACE request for initiation of formal consultation after review of the November BA with a concurrence of the LAA determination. In the correspondence, the USACE was reminded of the 135-day formal consultation timeline.

November 24, 2015: USACE conveyed the Service initiation of formal consultation letter to Barr and Enbridge announcing the required BO completion date no later than April 1, 2016.

December 1, 2015: Email from Enbridge to USACE and Service requesting clarification on BO timeline and permit issuance with a response request prior to December 3, 2015 to determine project construction scheduling. Service contacted the USACE and provided BO development status update and provided availability for phone call if needed during the first two weeks of December, 2015.

December 1, 2015: Email from Barr to USACE and Service clarifying USACE application and BO should reflect the project sponsor Enbridge Pipelines [Ozark] L.L.C. instead of Enbridge Energy, Limited Partnership as provided in permit application materials and BA. The USACE and Service both acknowledge the change by email.

December 2, 2015: Email from Enbridge to USACE, Service and Barr requesting a conference call to discuss BO development and consultation timeline. The call was arranged for December 8, 2015.

December 8, 2015: USACE, Service, and Enbridge, conducted a conference call to provide status updates for BO and permitting.

December 9, 2015: Email from Barr to USACE and Service conveying updated materials, finalized BA and USACE permit application for the administrative record.

December 18, 2015: Service provided a draft BO to the USACE. The USACE provided the draft BO to Enbridge and their consultant, Barr Engineering.

January 7, 2016: USACE, Service, and Enbridge conducted a conference call to review Enbridge comments to the draft BO.

January 11, 2016: USACE provided the Service with their comments to the draft BO, which included the comments from Enbridge.

February 5, 2016: Service provided an updated draft BO to USACE for final review.

February 9, 2016: USACE notified the Service of no further comments to draft BO.

February 10, 2016: Service conveyed final BO to the USACE.

BIOLOGICAL OPINION

I. Description of Proposed Action

The USACE is considering the current permit application for a petroleum pipeline replacement project by Enbridge under the authority of Section 404 of the Clean Water Act (33 USC 1344). The proposed project is located within the Niangua River channel and adjacent utility right of way approximately 5.5 miles southeast of Buffalo in the SE ¼ of Section 3, Township 33 North, Range 19 West in Dallas County, Missouri (Lat. 37.6091, Long -92.9991) (Figure 1). This reach of the Niangua River is designated critical habitat for the Niangua darter (*Etheostoma nianguae*). The Niangua River is listed as a Missouri Department of Natural Resources Focus Watershed and a Missouri Department of Conservation Priority Watershed to monitor and protect Niangua darter populations.

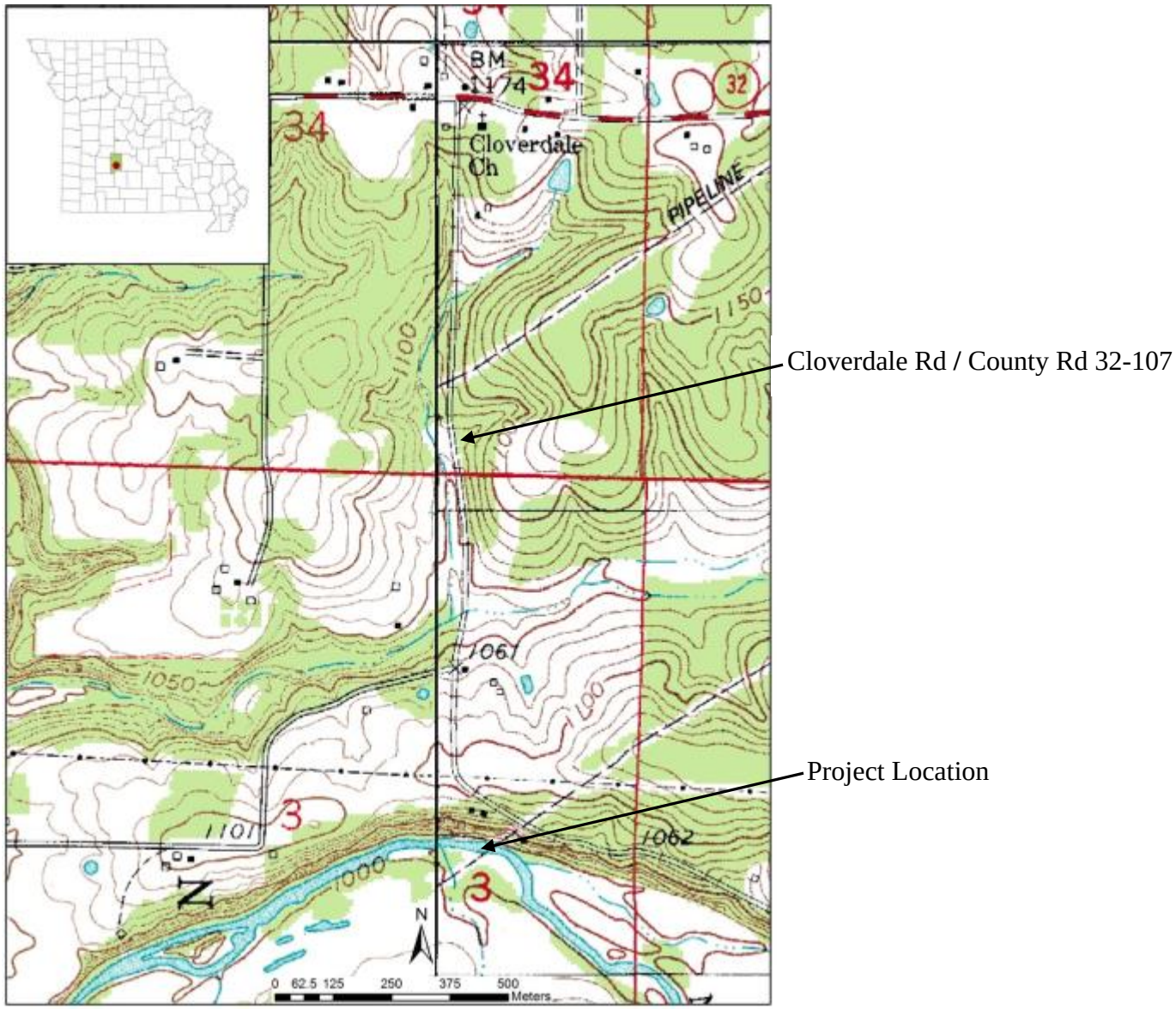

Figure 1. Project Location in Dallas County, Missouri.

The intent of the proposed pipeline project is to replace a length of active petroleum pipeline on Line 51 at Milepost 243 and remove a length of inactive pipeline on Line 53 that was previously cleaned and abandoned in place. Both lines cross under the Niangua River at differing depths within the same utility easement. The crossing location has two distinct active river channels separated by a mid-channel island feature (Figure 2). The replacement need was justified by the existing condition of Line 51. This pipeline was originally installed on the existing alignment but placed at an insufficient depth compared to the adjacent Line 53. The current Department of Transportation regulation, established in 1981, requires a minimum coverage of 48 inches within an inland body of water (CFR Title 49 – Part 195.248). This lack of sufficient depth/coverage allowed Line 51 to become exposed by natural erosional forces within the Niangua River. Upon the initial exposure, Line 51 was subsequently protected with an articulated concrete mattress prior to 1994. Since that date, continued stream bed degradation has re-exposed the protective mattress. The existing condition of Line 51 makes it increasingly prone to threats from collision and/or entrainment by debris, recreational boating or activities by an adjacent permitted commercial gravel harvest operator. Enbridge is acting to replace this line before continued erosional forces cause the line to become completely unsupported. This condition would substantially increase the risk for line failure. During construction, Enbridge plans to replace a minimum of 230 feet of Line 51 at an elevation at least 5 feet below the existing river bed elevation and offset 25 feet north of the existing line during a seasonally low water period. In summary, the primary project purpose is to replace Line 51 to prevent continued line exposure, premature line degradation, possible line failure, as well as limit the need for future maintenance. Such factors are also considered indirect long-term benefits to Niangua darter and its designated critical habitat.

Numerous alternatives were considered prior to the selection of the preferred alternative and are described fully in the BA. Those included 1) Do nothing 2) Armoring Line 51 in place 3) Horizontal directional drilling 4) Dam and pump 5) Dam and flume 6) Open cut through riverbed and armoring on top of bedrock and 7) The preferred alternative, open cut through riverbed and bedrock using phased construction. The preferred alternative was selected, in part, through informal consultation between the Service and the USACE with specific consideration to reducing impacts to the environment in general, the Niangua River, federally listed species, and time and costs necessary to complete construction.

In addition to installing a new segment of Line 51, project details include procedures to shut down, cap and adequately clean the existing Line 51, install and connect the new Line 51, conduct integrity/pressure tests, remove both abandoned line 51 and 53 segments, and reconfigure the riverbed and streambanks to pre-existing or improved conditions and replant native vegetation.

These actions described above will be completed during 4 separate construction phases. The first and second phases are to install the new pipeline and the third and fourth phases will remove the abandoned pipelines. This phased approach is preferred to synchronize the new segment tie-in with a scheduled pipeline shutdown. Each phase will use water filled cofferdams, referred to as AquaDams, strategically placed in the Niangua River to divert the river, allow the workspace to be temporarily dewatered, create a safe workspace, and prevent large quantities of turbidity created by construction from entering the river. The AquaDam is a flexible, durable, watertight

polyethylene tube that is designed to be floated into place and filled with water to create an effective seal on the river bed. This flow isolation allows the area behind the dam be pumped free of water. A properly sized AquaDam will provide sufficient freeboard to prevent an overtopping event if the river were to swell during construction. Specific construction details including typical drawings and descriptions were included in the BA. Actions associated with those construction phases are summarized below and the AquaDam proposed placements are depicted on Figures 3 and 4.

Figure 2. 2014 aerial photo of the Niangua River at the project location.

Phase 1

Erosion prevention and control measures will be employed prior to any construction activities. This includes all site access routes and staging areas. These areas will be protected via timber mats to reduce soil erosion and turbidity. The AquaDam will be initially floated into place and filled with groundwater separated from the Niangua River. This water will be obtained from an isolated four foot by four foot depression created in an adjacent gravel bar via a double screened pump. This measure will ensure no fish become entrained in or disturbed by the pump. The filling rate is expected to take three hours per 100 feet of AquaDam. The current configuration of the two separate river channels as depicted in Figure 2 may require a "pilot" channel be created via excavation to divert the main channel into the secondary channel before the AquaDam is initially set in place. However, since the September 2015 site visit, ample rainfall during fall 2015 appears to have created a satisfactory channel to preclude this. Minor levels of turbidity are expected as a result of the AquaDam installation/filling. Once the AquaDam is in place, efforts to de-water the work area will commence through the use of a double screened pump with a sediment filter and/or straw bale filter structure placed in an upland location to reduce turbidity downstream. During this dewatering activity, the area affected will be completely surveyed by biologists possessing appropriate recovery permits to find, relocate and return all stranded fish, including Niangua darters, into the river downstream of the action area. The sediment filter will be monitored by personnel to ensure it is functioning as intended. Once the river channel is dewatered, a trench will be excavated to install the new Line 51 pipeline segment.

The majority of the trench will be excavated using a backhoe or long-armed excavator. However, during exploratory design phases, shallow bedrock was noted along the right descending bank. In the event of bedrock exposure, contingency plans are in place to use controlled explosive charges to obtain the appropriate trench depth. Alternatives to the use of explosives were considered. According to the applicant, these mechanical excavation methods, although less expensive, would extend the length of project time in the river, substantially increase the risk of additional negative secondary impacts from flooding, and increase the level of non-lethal take to Niangua darters associated with the extended duration of noise and vibrations from mechanical excavation. All blasting, if warranted, will be conducted within six days over a two week period. The explosive charges will be designed, planned and placed to create the proper cut depth with specific consideration given to minimizing vibrations. The blasts are not expected to cause lethal effects to fish via barotrauma since construction will be conducted in an open, dewatered trench using blasting mats. Additionally, the vibrations and disturbance caused by mechanical trenching activities are expected to induce all nearby fish to vacate the project vicinity. Once completed, any/all bedrock within the trench will be inspected for fissures to ensure stream flow is not lost from the channel to the subsurface. If fissures are detected, they will be grouted or filled. All bed materials during trenching will be segregated by depth of origin and replaced in reverse order to help attain pre-construction conditions to the greatest extent possible and expedite streambed restoration. These trench materials will be stored within the dewatered work area to avoid needless moving of materials and limit construction completion time. However, contingency plans are in place to ensure that equipment and materials can be relocated from the work area to an upland location if an AquaDam overtopping event occurs and includes closely monitoring river gauges and weather forecasts.

Upon Phase 1 trench construction completion, the new pipeline segment will be lowered into place and the trench will be backfilled with previously excavated bed materials from the site in reverse order and the river bed will be restored to pre-construction conditions to the greatest extent possible.

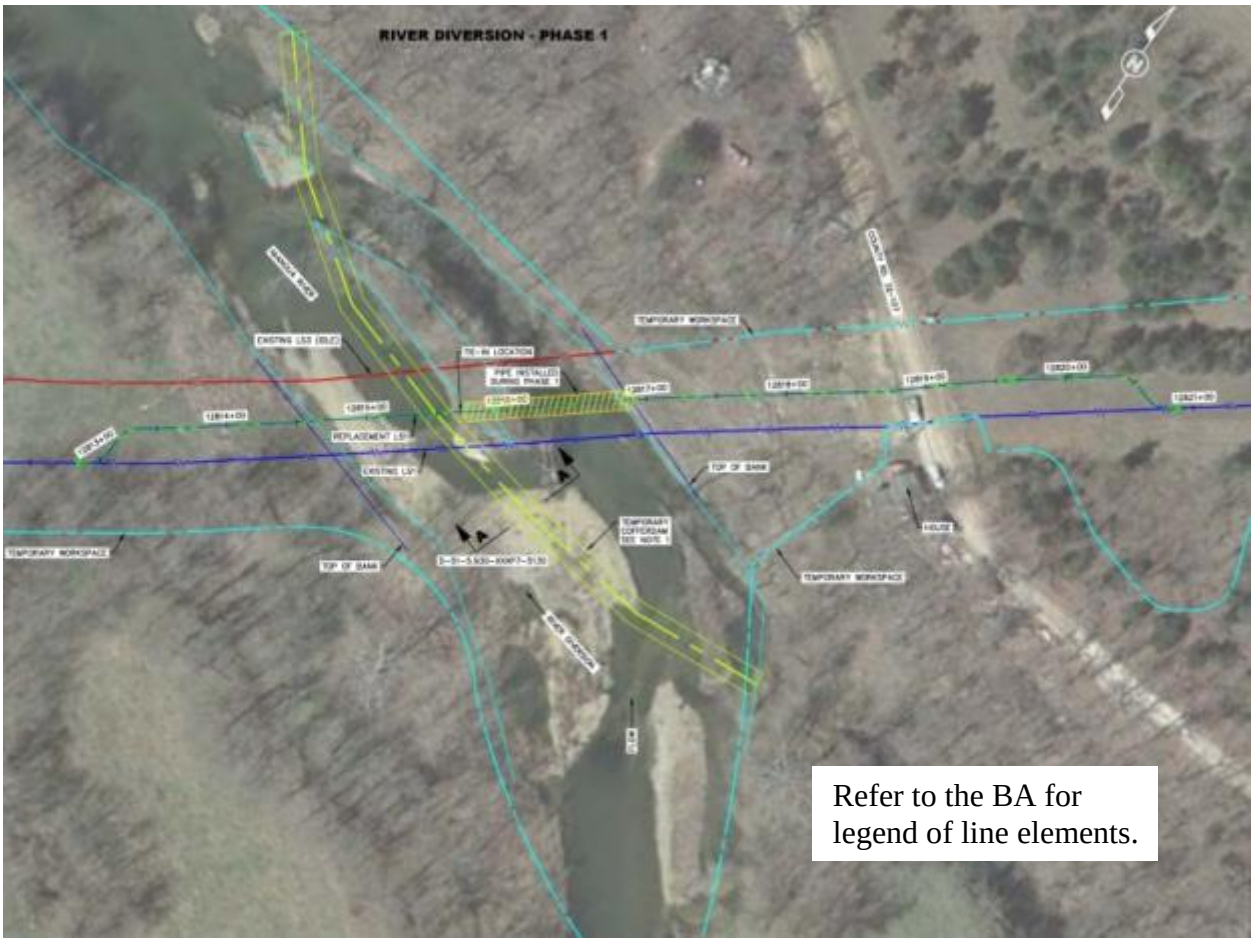

Figure 3. AquaDam and trench layout (indicated in yellow) for Phases 1 and 3.

Phase 2

The AquaDam will be partially dewatered into the straw bale filter structure and relocated to the secondary channel (Figure 4). Once in place, the AquaDam will be refilled and dewatering, trenching, and fish recovery activities will be repeated as described in Phase 1. Once trenching and new pipeline installation is complete, the two line segments will be welded. As with Phase 1, the trench will be immediately backfilled with previously excavated bed materials from the site in reverse order and the river bed will be restored to pre-construction conditions to the greatest extent possible. Once the trench filling is complete, the water within the AquaDam will be discharged into the straw bale filter structure and removed from the river. Upon AquaDam deflation, during each phase, the river base flow will return naturally and refill the dewatered area. Because of this, Phase 2 construction activities are expected to cause the largest amount of turbidity since the replaced trench materials will be washed and sorted as water immigrates into

each dewatered construction area. Minor turbidity is also expected from activities associated with relocating and removing the AquaDam. These impact details will be described in the **Direct Effects Section** below. Once complete, the new Line 51 will be hydrotested and strength tested for leaks and integrity per regulations (49 CFR 195.304).

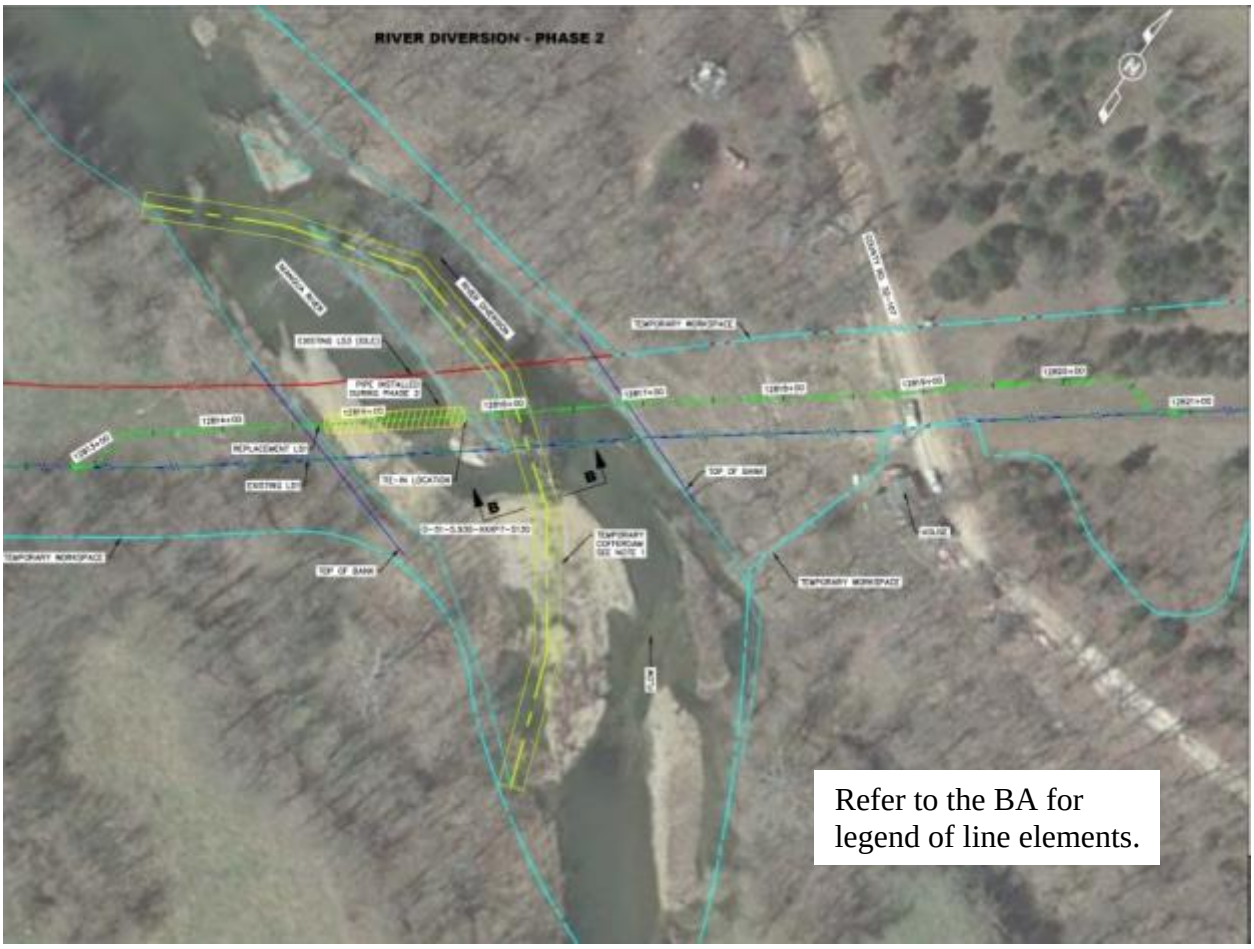

Figure 4. AquaDam and trench layout (indicated in yellow) for Phases 2 and 4.

Phases 3 and 4

The existing line tie-in will commence approximately 190 feet southwest and 360 feet northeast of the Niangua River (Figures 3 and 4). Prior to connection, the existing pipeline will be cleaned to further prepare the segment for removal. This process involves a spill response plan and kits necessary to contain any chemicals or oil that might result from an inadvertent release. A similar length of Line 53 will also be removed from the utility easement during these phases. In addition to the pipeline removal activities, Enbridge agreed to grade and reseed the existing erosional face(s) on the island within their easement to a less erosive slope (Figure 2). The island modification will minimize future sediment inputs into the Niangua River.

For pipeline removal, the AquaDam will be reinstalled as described for Phases 1 and 2. Fish recovery actions will again commence in the dewatered workspace. Once complete, the concrete

mattress will be removed and both Lines 51 and 53 will be exposed, cut and capped at least 50 feet beyond the existing streambanks. This distance will reduce the likelihood of future exposure if geomorphic changes were to occur within this stretch of river. The disconnected pipeline segments will be pulled from the river using excavating equipment and placed in the adjacent open field/pasture for removal. The river bed is not expected to be significantly displaced since the lines are either shallow or above the river bed. The AquaDam will then be dewatered into the straw bale filter structure and removed to restore permanent river flow. Although the BA indicated 20 construction days to complete the project, the applicant clarified that each phase is expected to take between 10 and 15 days. The total construction time within the river is now approximately 50 days. This timeline will be used as a surrogate for anticipated take from the project and will be described in the **Incidental Take Statement** section of this BO.

Upon project completion, Enbridge will have replaced a deteriorating petroleum pipeline at an appropriate depth, removed a secondary petroleum pipeline and an unnatural protective concrete mattress, restored the riverbed and stream banks, re-shaped the face of the adjacent actively eroding island to a less erosive slope, and reseeded the entire area disturbed by construction activities with native grasses and forbs. The project will be completed using novel construction methods meant to minimize impacts to the environment and associated resident aquatic species compared to other pipeline replacement methods considered.

These actions are expected to help protect future stream habitat and promote aquatic organism passage for both the Niangua darter and other resident aquatic wildlife species within this stretch of the Niangua River. Despite this, actions associated with this project involve direct and indirect impacts to the Niangua darter and its designated critical habitat and primary constituent elements as listed in the Federal Register referenced later in this BO. In the BA, adverse effects were identified and measures to avoid and minimize adverse effects to the Niangua darter were provided.

The following conservation measures were either provided in the BA or developed in consultation with the applicant. They are considered avoidance and minimization strategies to be performed either during or after the project to minimize prevent incidental take.

1. Avoid work during the Niangua darter spawning period, March 15 - June 15 to prevent impacts to spawning adults, eggs, and larval stages.
2. Employ erosion control best management practices (BMPs) prior to construction.
3. Conduct work during periods of low-flow to reduce:
    - Amount of water to be diverted
    - Interaction with and take from recreational water users
    - Potential presence of adult fish
    - Turbidity
4. Access the site via construction mats designed to transport heavy equipment across soft soil to reduce rutting and destabilization of soils.
5. Utilize an AquaDam to:
    - Minimize disturbance compared to other damming methods (e.g., sheetpile, sandbags)
    - Maintain uninterrupted river flow

- Prevent the need to route water around construction via pumps
- Prevent impacts to adjacent floodplain properties by impounding water
- Prevent Niangua darters from entering the workspace, being stranded or isolated
- Maintain movements for Niangua darter, their food and other aquatic wildlife
- Reduce turbidity

6. Fill AquaDam with native river water pumped from an isolated sump pit within an adjacent gravel bar to prevent Niangua darter take and reduce project timing needed to haul water.
7. Install fish screens on all water pump systems.
8. Ensure that an ESA Section 10 permit holder is present at the construction site during dewatering phases to remove any/all Niangua darters from dewatered workspaces and relocate them downstream of action area.
9. Monitor blasted bedrock for fissures and grout all fissures to prevent lost flow.
10. Continually monitor AquaDam to ensure an effective seal to prevent turbidity.
11. Implement, inspect and maintain the straw bale filtration device to cleanse return water from the AquaDam and dewatered areas resulting from phased construction.
12. Monitor stream turbidity downstream of the project area daily using a turbidity tube.
13. Implement contingency plans to reduce turbidity as needed.
14. Avoid instream work to the maximum extent practicable.
15. Stage transportation and equipment away from the Niangua River in upland areas to the maximum extent practicable.
16. Store materials, non-essential equipment, fuels, chemicals, and industrial lubricants in upland areas outside the floodplain
17. Construct secondary containment for all equipment, fuels, and chemicals to prevent fluid leaks from entering permanent waterbodies including silt fence/biologs around stockpiles.
18. Maintain strict erosion and sediment controls along the riparian zone.
19. Exclude the use of artificial materials and chemicals (e.g., sheet piling, pipes, flocculants, etc.) within the river flow during construction phases.
20. Contact concessionaires upstream of project to suggest alternative float routes for recreational users.
21. Place signage upstream of work area to visually notify water users that passage will not be allowed due to construction activities and the area is habitat for federally listed species.
22. Replace excavated materials in the reverse order of removal to help maintain pre-existing soil and riverbed profile integrity and facilitate habitat recovery and restoration.
23. Remove exotic materials/waste (i.e., concrete mattress, piping, non-native debris) within construction limits and replace/restore with native substrate.
24. Grade the face of the eroded island feature within the easement (Figure 2) to reduce excessive sediment inputs affecting downstream Niangua darter habitats.
25. A cover crop and/or sediment containment BMPs will be installed and maintained. Erosion control measures may include erosion control blankets, mulch, silt fences.
26. All disturbed areas will be reseeded with a native mix of grasses and forbs appropriate for the region to stabilize soils and mitigate future erosion.
27. Avoid use of pesticides and herbicides known to be toxic to aquatic environments.
28. Install permanent signage delineating the pipeline corridor to reduce the risk of pipeline damage or exposure from an adjacent commercial gravel harvesting operation.

A. Action Area

The action area includes all areas to be affected directly or indirectly by the Federal action, and not merely the immediate area involved in the action (50 Code of Federal Regulations [CFR] 402.02). The action area is not limited to the "footprint" of the project but rather encompasses the aerial extent of the biotic, chemical, and physical impacts to the environment resulting from the proposed action. The Service is ultimately responsible for delineating the action area. The Service agreed to the approximate nine acre area identified in the BA (Figure 5) as it also provides adequate consideration for the unavoidable indirect effects (e.g., increased turbidity, loss of habitat, etc.) on listed species referenced in the **Direct and Indirect Effects** section.

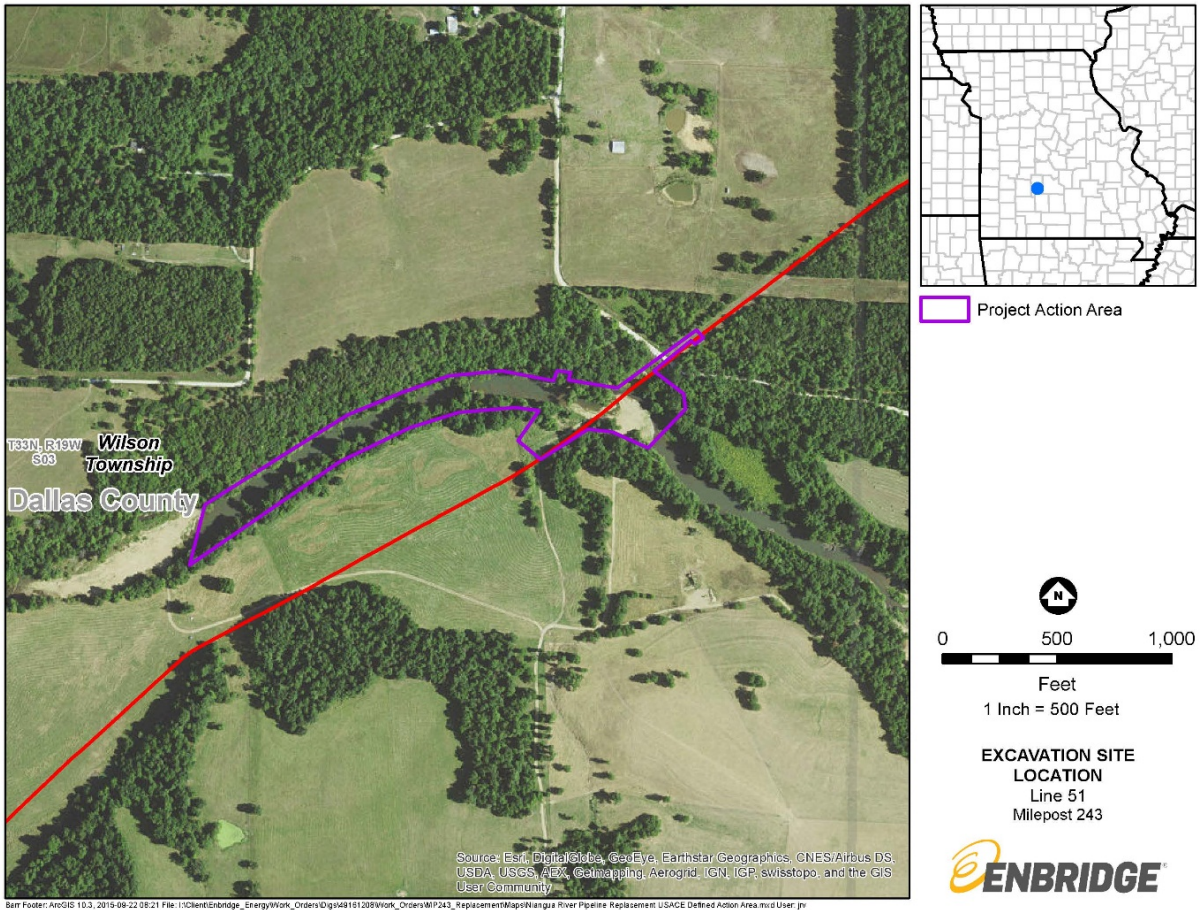

Figure 5. Action area defined in purple provided in the BA.

II. Status of the Species/Critical Habitat

This section presents the biological or ecological information relevant to formulating this BO. Appropriate information on the species' life history, its habitat and distribution, and other data on factors necessary to its survival are either included or referenced to provide background for analysis in later sections. This analysis documents the effects of past human and natural activities or events that have led to the current range-wide status of the species.

A. Species / Critical Habitat Description

Species Description

Figure 6. A male Niangua darter. Missouri Department of Conservation photo.

The adult Niangua darter is a slender, yellowish-olive colored percid fish that is approximately 3-4 inches long. It has eight prominent saddle bars evident along its back, orange spots scattered over the upper sides, a series of u-shaped greenish blotches alternating with narrow orange bars along its mid-side, and two small jet-black spots at the base of the caudal fin (which are distinguishable and significant to Niangua darters) (Figure 6). The breeding male has an orange-red belly and a series of iridescent blue-green bars along its sides. One of the bars crosses the base of the caudal fin, obscuring the two jet-black spots (USFWS 1989).

Critical Habitat Description

Section 4(a)(3) of the Act requires that critical habitat be designated to the maximum extent prudent and determinable concurrent with the determination that a species is endangered or threatened. Critical habitat was designated for the Niangua darter and included 94 miles of the 138 miles known plus a 50 foot corridor along each side of those 94 stream miles (USFWS 1989). This designated critical habitat is located in Camden, Cedar, Dallas, Greene, Hickory, Miller, and St. Clair Counties, Missouri. In determining which areas to designate as critical habitat, the Service considered those physical and biological features, referred to as Primary Constituent Elements (PCEs), essential to the conservation of the species, and that may require special management consideration or protection. Generally, PCEs include but are not limited to:

1) Space for normal behavior, individual and population growth.
2) Food, water, air, light, minerals, or other nutritional or physiological requirements.
3) Cover or shelter.
4) Sites for breeding, reproduction, and rearing or development of offspring.
5) Habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

When critical habitat was initially defined, it encompassed all known Niangua darter range. Since that time, additional survey records have extended the known range of the species beyond the designated critical habitat listing boundaries and are listed in the **Status and Distribution** section below.

B. Life History / Population Dynamics

The Niangua darter was originally described from a collection in the Niangua River in 1884 near Marshfield, MO (Gilbert 1887). All known populations of the Niangua darter are found in rivers and streams that are characterized as small to medium sized (between 3rd and 5th stream order) with a slight to moderate current, are relatively clear, which drain hilly topography underlain by bedrock consisting of chert-bearing dolomites. Niangua darters prefer the margins of shallow pools and runs throughout the year. They are directly associated with silt-free gravel or scattered rocky substrates with occasional boulders or bedrock (USFWS 1989).

The Niangua darter's movements are typical of most darters. They live entirely on the substrate and move about in short and quick surges. Some individuals have been reported to remain in the same stream pool over a period of days or weeks and occupy the same general area for extended periods. They are often seen moving around/beneath rocks to feed or use as escape or resting cover. The Niangua darter uses its long, slender snout to probe for food in crevices or between rocks. Stonefly and mayfly nymphs, crustaceans and snails comprise most of its known diet. Some benthic insects (larvae of caddisflies and blackflies; certain stonefly nymphs) are rarely eaten, even though they are common components of the stream biota. This diet segregation indicates a possible selectivity in its feeding habits (Pflieger 1997, MDC 2014).

In early spring, Niangua darters begin to move from pools and runs to swift, silt-free gravel riffles for spawning throughout the reproductive period (March – June). Females are only known to occupy these riffles during spawning. In courtship, females plunge into the gravel to deposit eggs for fertilization before being left unattended to complete development. It is presumed that this burying strategy provides an extra measure of protection for the developing eggs (USFWS 1989). This supports the notion that clean substrates are important to allow breeding behavior and promote recruitment success. Once hatched, the Niangua darter achieves about 50 percent of its adult length during its first season. The reproductive population is composed mostly of 1-2 year old fish, but individuals are noted to live three or four years (Pflieger 1997).

C. Status and Distribution

The Service listed the Niangua darter as a federally threatened species with designated critical habitat on June 12, 1985 (USFWS 1985). It is restricted to the Ozark Region, specifically to a few clear, medium-sized tributaries in the middle and lower Osage River basin in south-central Missouri.

Since the Niangua darter was listed, significant amounts of research continue to provide a better understanding of its life history requirements, status and distribution (Mattingly 1995, Mattingly and Galat 1997, 1998, 2002, Novinger et al. 2008a, Novinger et al. 2008b, Novinger and Decoske 2009-2014). All research, recovery needs and efforts are directed by the recovery plan

(USFWS 1989) and the multi-agency Niangua Darter Recovery Team established in 1991. This team identified ecological research as a top priority. MDC has coordinated the majority of this work by performing annual monitoring surveys for the Niangua darter from mid-June through the end of September. Monitoring reports have been generated between 2002 and 2014 for all 8 watersheds where the Niangua darter is known to occur (USFWS 2014). These data were collected to describe spatial and temporal trends in population densities, size structure, associated darter species diversity, and multi-scale habitat characteristics. MDC also monitors select habitat improvement projects such as low water crossing replacements to assess their effectiveness for Niangua darter (Novinger et al. 2008b).

The Niangua darter is extant in eight of the 10 known populations comprising 269.5 stream miles in the following north-flowing Osage tributaries: Niangua, Maries, Pomme de Terre, Little Niangua, Little Pomme de Terre, and North Dry Sac rivers and Tavern, Maze, Brush, and Bear creeks (Figure 7) (USFWS 1989, Mattingly and Galat 1998, MDC 2015). The current range is 131 miles beyond the range known at the time of listing (138 miles). Its distribution within these streams is notably clumped, which suggests habitat specialization (Pflieger 1978). It was likely more widespread historically. Despite the fact that the Niangua darter has never been abundant in collections, the construction of four large reservoirs within the Osage watershed between 1931 and 1970 likely eliminated a large portion of its supportive habitat.

The current distribution was derived from limited surveys during the 1940s to 1980s. During that time, major changes occurred to the watersheds occupied by this species. The largest change was the conversion of stream habitat to deep lakes via reservoir construction. Lake of the Ozarks was constructed in 1931, followed by Stockton, Pomme de Terre, and Truman reservoirs during the 1960s and 1970s. As a result, it appears the Maze Creek and Little Pomme de Terre River populations are now extirpated by the completion of Stockton and Truman Reservoirs. In addition to these lakes, the landscape was also modified during this time as the bottomland forests were converted to pasture and cropland.

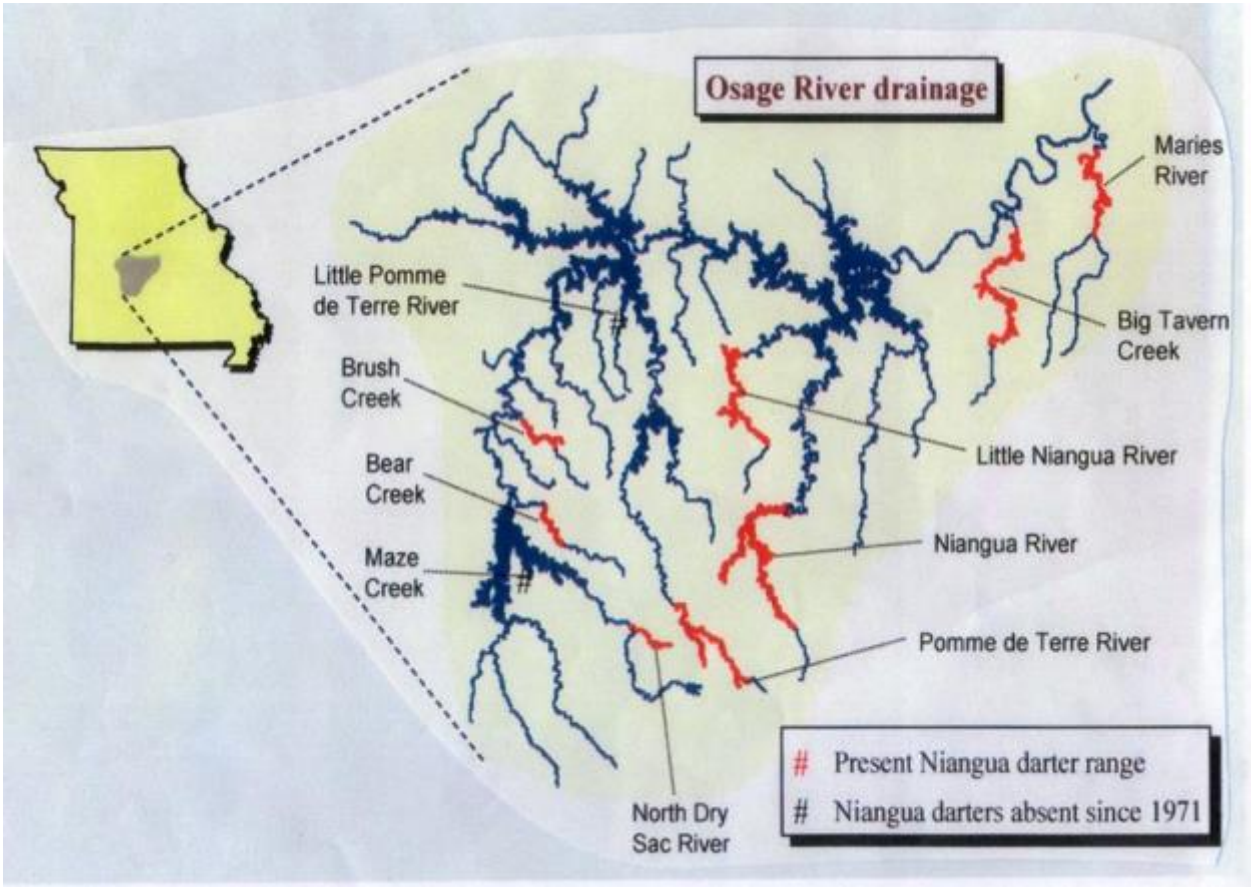

Figure 7. Niangua darter distribution in Missouri.

No new Niangua darter populations have been found despite the most recent survey efforts. However, many range extensions and new occurrence records have been noted since the designated critical habitat listing. The initial range extensions were identified within existing populations of Greasy Creek, South Fork Pomme de Terre River, and Little Pomme de Terre River South (Mattingly and Galat 1998). Additional findings since these 1998 data include: a downstream extension on Little Niangua River in Camden County, a downstream extension on Niangua River in Dallas County, a downstream extension on the Pomme de Terre River in Polk County, a downstream extension on Tavern Creek in Miller County, a discovery in Little Tavern Creek and Kenser Creek in Miller County, a discovery in Little Wilson Creek in Polk County, and a discovery in Macks Creek and Fiery Fork in Camden County (MDC 2012).

The Niangua darter has undergone several status reviews since its listing date. The most recent occurred in March 2014 resulting in no change to the listing classification of threatened (USFWS 2014). Many factors continue to affect Niangua darter persistence. Two main threats to its survival and recovery are population fragmentation and habitat destruction. Other than the population and habitat losses attributed to the large reservoirs mentioned above, current populations are further impacted by the multitude of low-water crossings that continue to act as migration barriers within respective Niangua darter watersheds. Construction of these bridges, have further isolated many local populations. In addition to genetic implications described below, these populations are at an increased risk from stochastic events (e.g., drought, disease

and predation). Once isolated, they become progressively prone to effects from habitat degradation by small, local projects (e.g., gravel harvest, brush clearing, and stream dewatering). Such actions can further degrade the fish's remaining habitats by increased erosion, siltation, bed destabilization, and poor water quality. If the effects are severe enough, Niangua darters could become locally extirpated simply because they lack the ability to escape into a more hospitable environment. As these effects continue, the overall population may decline further because of continued inability to return to historical habitats needed to maintain these residual populations. Other negative consequences such as genetic effects caused by inbreeding depression can arise from species level changes as individuals become isolated/fragmented for an extended time period. It has been reported that mating with close relatives can reduce offspring fitness in the form of poor reproductive success, lower survival, or severe abnormalities (Keller and Waller 2002). If such deleterious effects are allowed to progress, these species level effects can result in population or ecosystem level changes (Pringle 1997). Future studies are needed to assess whether these issues are contributing factors to the current and future Niangua darter status.

D. Analysis of the Species / Critical Habitat Likely to be Affected

A designated critical habitat segment was defined in the Federal Register for the Niangua River, Dallas County, Missouri. It is listed as “Niangua River and 50 feet on each side of the river from county road K upstream to 1 mile beyond county road M to the Webster County line.” (Figure 8) (USFWS 1985). This stream segment is approximately 37.5 miles. Specific Niangua darter PCEs listed for all areas designated as critical habitat consist of medium sized creeks with silt free pools and riffles and moderately clear water draining hilly areas underlain by chert and dolomite. Water ranges from 8 to 46 inches in depth over gravel with scattered rubble (USFWS 1985).

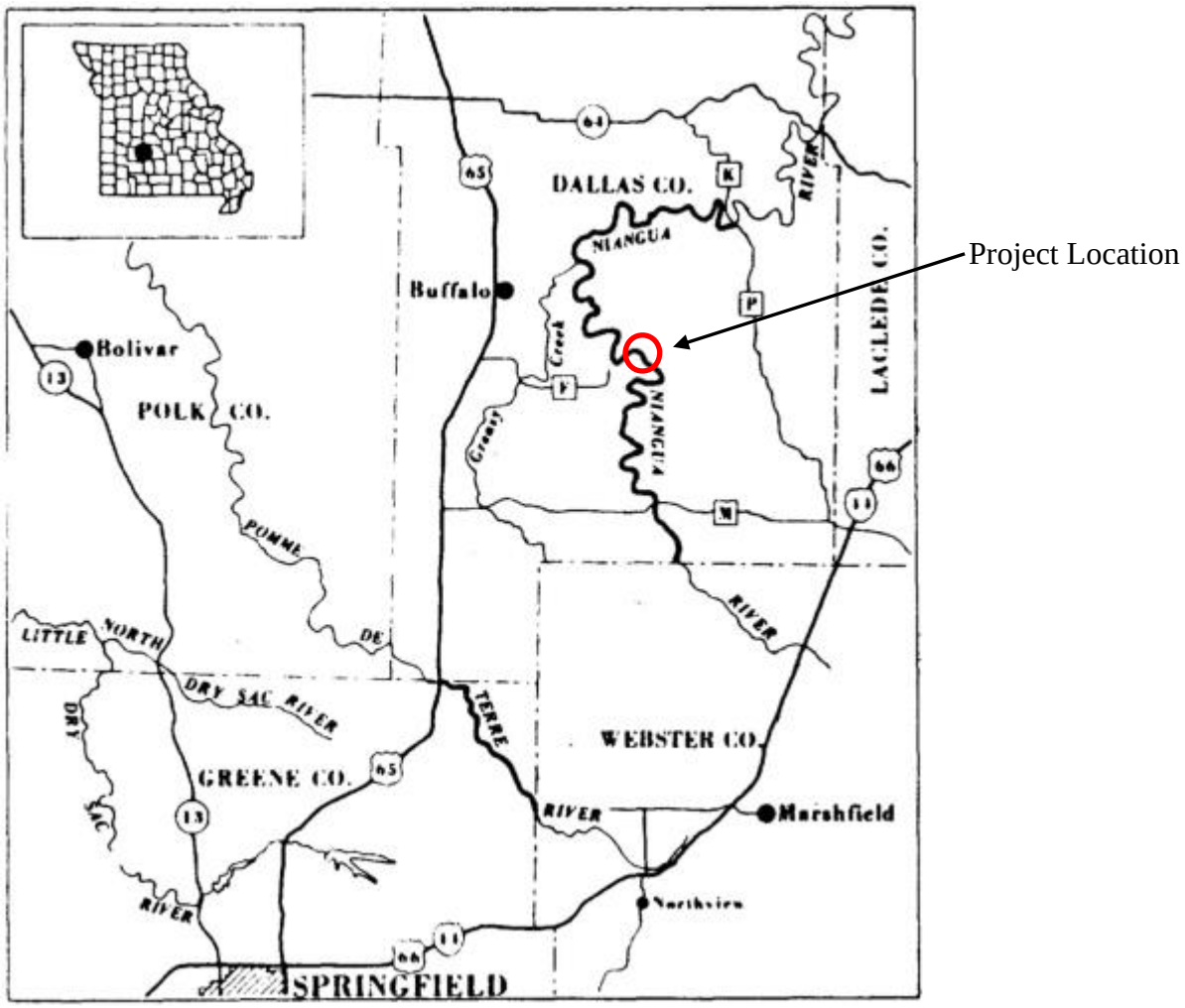

Figure 8. Designated critical habitat defined for the Niangua River, Dallas County, MO.

III. Environmental Baseline

The environmental baseline is defined as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area, which have already undergone Section 7 consultation, and the impacts of state or private actions that are contemporaneous with the consultation in process (50 CFR §402.02).

The purpose of the environmental baseline is to describe those factors that have contributed to the current status of the species and its habitat in the project vicinity. Range-wide factors affecting Niangua darter were noted as listed under *Summary of Factors Affecting the Species* in the final listing rule (USFWS 1985). The most applicable factors to the action area listed within the listing rule were siltation and channelization (USFWS 1985). Specific primary threats currently present include destabilization of stream channels, sedimentation, and nutrient enrichment (Pflieger 1978). Additional factors potentially affecting the Niangua darter and the designated critical habitat in the action area include activities typically associated with

commercial gravel harvest, cattle grazing agriculture, an unimproved Dallas County road, recreational boating, and recreational fishing. These factors will be described below.

A. Status of the Species in the Action Area

To date, no surveys have been conducted and no Niangua darters have been reported within the action area. However, in other reaches of the Niangua River, MDC has confirmed continued Niangua darter presence widely distributed throughout the basin at multiple sites upstream and downstream of the project location (Figure 9). The closest/most recent Niangua darter records are one mile upstream of the action area and two miles downstream (MDC 2015, Novinger and Decoske 2012 and 2014).

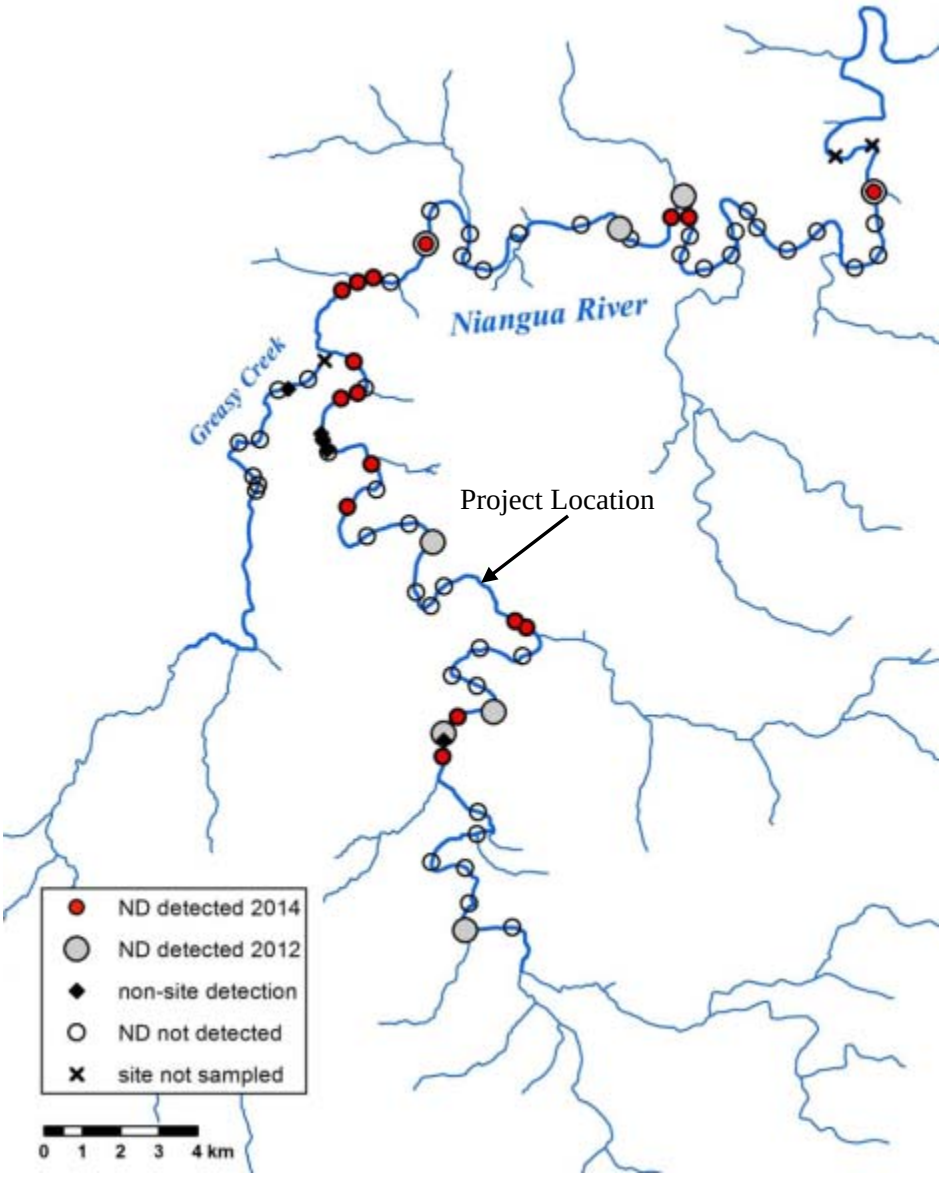

Figure 9. Missouri Dept. of Conservation Niangua darter monitoring data for 2012 and 2014.

In 2012, 67 sites were sampled yielding only 8 site detections, an 11.9% occurrence rate. In 2014, 66 sites were sampled yielding 15 site detections, an increase to 22.7%. Juvenile numbers also increased from 0 sites in 2012 to 9 sites reported in 2014. Model-averaged estimates of occupancy between sampling years remained at 0.25 but detection probability increased from 0.22 in 2012 to 0.84 in 2014. Similarly, site occurrence increases were also noted between 2013 and 2011 efforts within the Tavern Creek population despite population level differences (Novinger and Decoske 2013). In these Tavern Creek comparisons, Niangua darter occurrence increases appeared to be associated with visual cover such as water willow (*Justicia americana*) and an association with adjacent deep pools and nearby riffles (Novinger and Decoske 2013). Although the frequency of visual cover was reduced between 2014 and 2012 in the Niangua River, an increase in water willow presence was noted between comparisons to earlier Niangua darter surveys in this basin. Simple comparative inference between these separate reports appear to support that an increased presence of water willow or possibly an indirect association with habitat stability could be a factor contributing to the noted positive change in species presence. This inference may also support a similar increase in occurrence/abundance of other darter species, including the rare Bluestripe darter (*Percina cymatotaenia*) as reported in the Niangua River during 2014. Recognizing that future studies will be necessary to support this hypothesis, water willow and associated habitat conditions do exist throughout the action area (Figure 8) and will be used and considered to help dictate an estimate of Niangua darter abundance within the action area and used to calculate level of take expected during the project. These estimates will be provided in the **Incidental Take** Section below.

Niangua River Summary: The Niangua darter population remains stable and relatively widespread despite the occurrence of extreme environmental conditions (drought and flooding) between survey years. Observations of juveniles and small adults indicate successful recruitment during 2013 and 2014.

B. Factors Affecting the Species in the Action Area

Several natural and anthropogenic factors affect the species in the action area. Niangua darters are naturally affected by precipitation, groundwater, sediment inputs and water levels throughout the year. A variety of farming practices, gravel harvest, a county road and two private roads could also impact Niangua darters. Each factor, along with the associated activities/effects will be described.

Farming activities associated with cattle grazing are currently taking place adjacent to the Niangua River. These activities could affect the stability of the soils and the stream channel. Application of herbicides, pesticides, fertilizers and in-stream watering of livestock could affect water quality, vegetation buffers, soil parameters, and nutrient productivity within the watershed. Accelerated soil inputs from eroding banks and tilled cropland could also affect Niangua darters by sedimentation from aggradation (the overloading of the sediment load and transport continuum). One result of sedimentation includes the possible smothering of quality habitats downstream. If this were to occur during the spawning season, we expect that eggs/fry would likely die from being covered/smothered by clay and silt particulates.

Gravel harvest could also affect the habitat quality and stability of the stream channel. Excessive and/or improper gravel harvest activities could destabilize supportive habitat, develop secondary pools which could entrap fish, and induce bed and bank erosion. River gravel is a commodity that is regularly mined/harvested from Missouri streams. Improper gravel harvest practices could have negative consequences to both Niangua darter and designated critical habitat. Commercial gravel harvest is regulated by the State of Missouri by the DNR Land Reclamation Program pursuant to 444.760 RSMo. This regulatory oversight provides covenants and BMPs related to those activities on all Missouri streams including those which support Niangua darters. Gravel harvest for personal use however, is not currently regulated and could negatively impact habitats as described above.

An active, legally permitted, commercial gravel harvest operation is present directly adjacent to the project area, and on the two gravel bars immediately above and below the action area. The three sites (2486, 2487, and 2488) are associated with Land Reclamation Commission Permit #1100. Although listed and enforced independently, each site is cumulatively permitted for the annual harvest of less than 5000 tons. Site 2487 is within the action area but represents the smallest harvest area at approximately three acres of the 12 total acres permitted. The original permit was issued July 2013 and has been renewed annually. The current permit is set to expire July, 21, 2015. The DNR Land Reclamation Program monitors this site on a two-year return interval.

Two separate private roads are currently used by the gravel harvest operator and a private landowner to access the river and the county road, Cloverdale Road, all of which potentially affect the action area. These unimproved roadways all likely supply minor levels of extraneous silt/sediment during heavy precipitation events that could affect Niangua darter and designated critical habitat.

C. Status of the Designated Critical Habitat in the Action Area

The action area represents approximately one-half (0.5) mile of the 37.5 mile designated critical habitat in the Niangua River. The entire river channel and 50 feet on either side of the Niangua River is designated critical habitat, which serves as an open corridor to allow Niangua darter movements to access and utilize habitats upstream and downstream. The Service conducted site visits in January and September 2015 and concluded that portions of the project area along the main channel (Figures 2 and 10) possesses suitable Niangua darter habitat as listed in **Life History/Population Dynamics** section above. The action area contains all the Niangua darter's PCEs and physical or biological features essential for the species' conservation. The right descending bank, with exception to the utility easement, is currently buffered by a 260 foot average width wooded riparian corridor, and the left descending bank, with exception to the utility easement, is currently buffered by a 60 foot average width wooded riparian corridor. Specific habitat characteristics noted were long shallow pools with adequate flow possessing a diverse composition of various sized consolidated gravel and cobble materials lined by the notable presence of water willow. Pools and riffles are also present both upstream and downstream of the project area within the action area.

Figure 10. Indicative Niangua darter habitat along Enbridge Utility Easement.

The proposed project involves the temporary diversion of the river into one of two existing channels via placement of a coffer dam (aka AquaDam) to provide a safe and dry environment to allow trenching, removal, and replacement of bed materials over a new pipeline while the river flows unimpeded around the construction area. The critical habitat affected includes the approximate 700 feet by 170 feet work area within the Niangua River referenced in the BA (Figures 3 and 4). This large area is necessary for the installation and removal of the temporary AquaDam needed to dewater the proposed work and staging areas. The majority of impacts to designated critical habitat are expected to occur in an area approximately 20 feet wide and 250 long, which is needed to trench and install the new segment of Line 51 to a new elevation five feet below the existing grade. The downstream pools could be negatively affected by sediments mobilized by the activities associated with the AquaDam installation, relocation and removal, as well as line replacement and removal.

D. Factors Affecting Designated Critical Habitat in the Action Area

Similar to factors affecting the species described above, the primary factors affecting designated critical habitat within the action area are natural factors such as quantity, frequency and magnitude of precipitation events, groundwater inputs, and associated water levels as well as their effect on the gravel bars and noted erosion along the island and bed condition via the concrete mattress in the project area throughout the year. Other anthropogenic factors include farming practices associated with cattle grazing adjacent to the Niangua River, regulated and unregulated gravel harvest, sediment and pollution inputs from Cloverdale Road and two private roads, recreational boating and fishing activities within the Niangua River. These factors affect water and soil quality, stream bank and bed stability, and substrate and soil condition by the

application of herbicides, pesticides, and fertilizers, in-stream livestock watering and crossing of livestock, removal of gravel and inputs of sediment, or minor physical alterations of habitats. Individual or combinations of these factors may potentially result in the loss of Niangua darter spawning habitat and negatively affect future recruitment.

IV. Effects of the Proposed Action

Effects of the action are defined as "the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with the actions, that will be added to the environmental baseline" (50 CFR § 402.02). When conducting an effects analysis, we determine: (1) whether individuals will be exposed to the proposed action, (2) if so, whether adverse effects to individuals may occur and whether these effects rise to the level of adversely affecting the population to which the individuals belong, and (3) if so, whether the population-level effects will adversely affect the survival and recovery of the species. To understand the impacts on designated critical habitat, we must evaluate whether the impacts to the physical and biological features will adversely modify the critical habitat by reducing its value for the survival and recovery of the species. If the impacts to the critical habitat appreciably diminish the use of that area to continually move towards the recovery of the species, then the critical habitat has been adversely modified.

A. Direct and Indirect Effects

Direct Effects

Direct effects are defined as the direct or immediate effects of the action on the species or its critical habitat. Direct effects result from the agency action, including the effects of interrelated and interdependent actions. The applicant and the USACE have incorporated conservation measures listed on pages **14** and **15** into the project to reduce effects to the Niangua darter and designated critical habitat. While these measures reduce the effects of the action, it is not possible for these measures to completely avoid adverse effects to the species and designated critical habitat.

The Service considers the stream reach within the action area to be suitable habitat for the species. This suitability is supported by recent occurrence records within one mile upstream and two miles downstream (Novinger and Decoske 2012 and 2014). However, with incorporation of the conservation measures, direct effects to Niangua darters are expected to be minimal and limited to only non-lethal effects. The following elements were considered to substantiate this conclusion:

- The majority of the project footprint, although suitable, is not preferred (i.e., deep pools) for the Niangua darter during the project construction period noted.
- AquaDam placement and filling will take several hours to complete. This time lag will ensure effective displacement of Niangua darter individuals from directly under AquaDam.
- Specific salvage efforts are planned during dewatering phases to ensure all/any stranded Niangua darters, although unexpected, are found and safely relocated.

- Blasting, if necessary, is not expected to impact Niangua darter due to occurring only in dewatered regions with blast mats and individuals expected to be displaced an effective distance from associated construction noises/vibrations.
- The site condition is naturally separated into two distinct channels by a large island and will allow the river, resident fishes, and their food base to move unimpeded in one of the two existing channels throughout all construction activities.
- Construction is to occur during a low flow period and over a short time frame (50 days).
- Impacts attributed to turbidity created from the AquaDam's installation, relocation and removal and re-watering of all dewatered work areas are also minimized to 12 days of the total construction period and expected to attenuate downstream from project area.
- Temporal habitat impacts are expected to be minimal, temporary and confined only to dewatered areas.
- Surface bed materials removed (20 feet wide X 250 feet long) from the trench will be segregated and replaced in proper reverse sequence to minimize long-term habitat impacts.
- Screened pumps will be monitored for fish impingement during all dewatering activities.
- Additional habitat restoration efforts were added to project plans to improve Niangua darter habitat conditions. These include reversed replacement of all trenched materials removal of the articulated concrete mattress and reshaping the erosional problems on the island.

Using these considerations, no direct mortality is likely to occur in the immediate construction area as a result of construction activities. We also do not expect mortality to occur downstream of the project. However, Niangua darters present downstream of the construction site (including fry, juveniles and adults) could be adversely affected by noises, vibrations, sediments and fines mobilized from installing, moving and removing the AquaDams during each phase, rehydrating areas after trenching, pipeline installation, and removal of the pipeline segments. The increases in vibrations, turbidity and sedimentation may temporarily affect normal behavior such as feeding, daily movements and habitat use of individuals as well as potentially smother and degrade suitable habitat. However, we expect that these effects will attenuate with distance downstream, and cease once high flows flush the sediments.

Designated critical habitat is likely to be affected in the action area during project implementation. Construction elements that affect designated critical habitat are: 1) AquaDam installation, relocation and removal during each construction phase, 2) Modification of a gravel bar to create a pilot channel during Phase 1 construction, 3) Trenching, blasting and replacement of substrate, 4) Pipeline removal activities, 5) Articulated concrete mattress removal, 6) Slope modification to an actively eroding face of the island in the utility easement, 7) The activities associated with installation of erosion and turbidity containment BMPs during construction and reestablishment of grassed buffer along the banks throughout the area of disturbance.

As with species effects, the effects to designated critical habitat are anticipated to be spatially limited, temporary and attenuate with distance downstream. Also, we expect long-term project benefits to Niangua darter habitat quality compared to the existing conditions due to the numerous specific habitat restoration elements included in the project.

Indirect Effects

Indirect effects are caused by or result from the agency action, are later in time, and are reasonably certain to occur. Indirect effects may occur outside the immediate footprint of the project, but would occur within the action area as defined. Similar to the direct effects described above, increased turbidity from the suspension of fine particulates and sedimentation may occur for a limited distance downstream during rain events following construction and until the grassed buffer is established. A second indirect effect to individual Niangua darters and designated critical habitat includes the possible migration of the stream channel in response to the absence of the articulated concrete mattress (see **Description of Proposed Action** section). The presence of the mattress and underlying pipeline could be a grade control feature maintaining the existing channel morphology. Removing it, may induce a "headcut" and channel incision. The mobilization of these materials may degrade designated critical habitat downstream and may continue to impair the feeding, movement, and habitat use of individuals. However, when considering the exiting mattress and line condition, this natural degradation seems to be occurring regardless of the mattress presence. Also, the many negative consequences (e.g., line failure) associated with maintaining the pipeline and mattress in the existing condition, should be considered far more detrimental than the indirect effects associated with its removal. Removing the mattress also has many lasting positive indirect effects, including potential for increased Niangua darter movements and other resident aquatic life, and creation of additional habitat for critical life stages that is not currently available. To help reduce the possibility of stream degradation caused by line removal, a monitoring protocol is included within the Incidental Take Statement described later.

Other indirect effects of the project associated with island modification, declaring the utility easement boundary and posting signage depicting Federally listed species and critical habitat presence may benefit the Niangua darter and designated critical habitat by directly reducing habitat and water quality degradation and sedimentation, which are all threats to the species. The island modification may arrest existing island erosion and help stabilize the bank. The easement boundary identification will help prevent the adjacent gravel mining activity from working around the buried utility line and prevent potential line maintenance issues. The signage may create/ raise public awareness and cause more involvement regarding notification of potential issues such as erosion or pollutants which could contribute to long-term stability in this reach of the Niangua River. These features, promote stream stabilization and the development of suitable darter habitat which directly contribute to the recovery of the species, and benefit other aquatic and terrestrial wildlife species in the action area.

Summary

All adverse effects associated with the project activities are expected to be temporary. We do not anticipate any major long-term adverse effects from the project activities. The removal of the degrading pipeline and the protective concrete mattress are considered beneficial actions for the Niangua darter.

We do anticipate the project to result in direct and indirect adverse effects to a small number of individual Niangua darters (N=12) and designated critical habitat. This number is based on results of previous Niangua darter surveys and calculations using average relative abundance data within this reach of the Niangua River. The nearest downstream location indicated four Niangua darters in a 0.3 mile segment. These data were compared to the environmental baseline, habitat condition and availability mentioned for the species in the action area. Using a detection probability of 0.5, it is expected that no more than 12 individuals occur in the action area (Novinger and Decoske 2012, Novinger and Decoske 2014 and D. Novinger pers. comm. December 11, 2015). However, these effects are limited to only non-lethal, temporary effects such as changes in feeding or movements from increased turbidity, construction noises, channel migration, and handling stress if found during dewatering phases. The long-term, beneficial effects of the project likely offset these temporary adverse effects. We do not expect the adverse effects to individual Niangua darters in the action area to reduce the overall health and viability of the local population. The Niangua River designated critical habitat is approximately 37.5 miles in length and Niangua darters were found in multiple locations throughout the Niangua River designated critical habitat in the two most recent sampling events (Figure 9). Because we do not anticipate population-level impacts, our analysis of effects to the Niangua darter is complete. Likewise, the AquaDam installation and relocation during the four construction phases, trenching activities, stream and island modification, and bank disturbance will also affect designated critical habitat. However, as with the species effects, we believe these effects will be temporary and attenuate with distance downstream as depositional materials become entrained into the area proposed for construction.

B. Effects of Interrelated and Interdependent Actions

Interrelated actions are those that are a part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Currently, there are no anticipated interrelated or interdependent actions associated with the proposed pipeline replacement project.

V. Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act.

The land surrounding the action area is privately owned. Land use includes gravel bar harvesting and cattle farming/pastureland on the left descending bank and native woodlands on the right descending bank. The practices associated with these activities (e.g., removal of gravel, cattle grazing, in-stream watering, and application of chemicals) can cause destabilization, erosion, sedimentation and water quality degradation. Despite the woodland buffer between the road way and the river, potential contaminated runoff and maintenance activities associated with unimproved roads cumulatively affect Niangua darters and designated critical habitat in the action area as described above. These activities are on-going and likely to continue into the

future. These effects will continue to contribute to habitat degradation and species impacts as described in the **Status and Distribution** section above.

VI. Conclusion

Implementation of this project is likely to adversely affect Niangua darters. Designated critical habitat in the project area and adjacent riparian areas within the bed and banks of the Niangua River will also be adversely impacted during the replacement of the deficient petroleum pipeline.

After reviewing the current status of the Niangua darter, environmental baseline for the action area, the effects of the pipeline replacement project, and cumulative effects, it is the Service's biological opinion that the completion of the project, as proposed, is not likely to jeopardize the continued existence of the Niangua darter or adversely modify designated critical habitat to the extent to impede the survival or recovery of the species. This determination is based on the following considerations: 1) the action area and project footprint are small relative to the overall designated critical habitat and known range for the species (0.5 and 0.1 of the 94 and 269.5 miles respectively); 2) the action area and project footprint are small relative to the 37.5 mile Niangua River designated critical habitat; 3) the numbers of darters expected in the action area is extremely limited (approximately 12 individuals) 4) Construction time is short (50 days); 5) the overall Niangua darter population appears to be stable or increasing; 6) the Niangua River Niangua darter population also appears to be stable or increasing; 7) the Niangua River Niangua darter population represents only one of the eight stable populations; 8) the project is not anticipated to result in any mortality; 9) the habitat impacts in project footprint are temporary; 10) the indirect effects are expected to attenuate within a short distance of the project footprint; 11) several indirect effects are expected to have beneficial effects for the species.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to Section 4 (d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering [50 CFR §17.3]. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7 (o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the USACE, so they become binding conditions of permitting issued to the applicant, as appropriate, for the exemption in Section 7(o)(2) to apply. The USACE has a continuing duty to regulate the activity

covered by the incidental take statement. If the USACE (1) fails to assume and implement the terms and conditions or (2) fails to require the permit applicant to adhere to the terms and conditions through enforceable terms that are added to the permitting documents, the protective coverage of Section 7 (o)(2) may lapse. In order to monitor the impact of incidental take, the USACE or the permit applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR §402.14(i)(3)].

A. Amount or Extent of Take Anticipated

As described within the **Effects of the Proposed Action** section, incidental take of the Niangua darter could occur if individuals are present in the action area. As defined above, the term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such conduct.

The majority of take is expected to arise from the attempt to harass, harm and/or capture by a temporary habitat disturbance, possible species displacement during construction, temporal habitat loss, possible handling, and effects to normal daily behavior resulting from turbidity increases created by construction. Using the best available information, the Service estimates that approximately 12 Niangua darters could occur in the action area and therefore would constitute the maximum number of individuals affected by non-lethal take from project activities. Although the Service anticipates that no more than 12 Niangua darters will occur in the action area, the actual number affected is difficult to quantify. The large size of the action area and the Niangua darter's small size and benthic nature further hinder this assessment. The inventory methods that would be required to quantify actual incidental take are not practical. The Service believes such an inspection would only induce unnecessary take. Therefore, the number of construction days which produce the adverse effects to the action area will be used as a suitable surrogate to monitor the level of take. The Service anticipates a **60 day** disturbance to all Niangua darters within the stream portion of the action area. This decision is based on the applicant's 50 day construction timeline for all water related activities and time expected for Niangua darters to resume normal life activities.

B. Effect of Take

After reviewing the current status of Niangua darter, the environmental baseline for the action area, the effects of the proposed actions, and the cumulative effects, it is the Service's opinion that the actions, as proposed, are not likely to jeopardize the continued existence of Niangua darter and is not likely to destroy or adversely modify designated critical habitat. Take is expected to be temporary and minimal resulting from impacts associated to the temporary displacement of individuals or effects to behavior during construction. We expect the local population to resume normal activities within 10 days after project completion.

C. Reasonable and Prudent Measures

The Service believes the following RPMs are necessary and appropriate to minimize impacts of incidental take of Niangua darters:

1. Implement the conservation measures listed in the **Project Description** section above.

2. Avoid and minimize direct harm and habitat modification of Niangua darters in the project area.

D. Terms and Conditions

In order to be exempt from the prohibitions of Section 9 of the Act, the USACE must comply with the following terms and conditions, which implement the RPMs described above. These terms and conditions are mandatory.

1. The construction staff will be required to implement all conservation measures incorporated into the project design as referenced in the **Description of Proposed Action** section.

2. Contact information for the Service's CMFO biologist (Bryan Simmons 417-836-5302) will be provided to all appropriate on-site construction manager(s) for:
    a. notification of construction initiation and completion dates,
    b. any clarification regarding the conservation measures or terms and conditions,
    c. reporting of any deficiencies in the implementation of the conservation measures or terms and conditions, and/or
    d. other emergency notifications.

3. Water clarity will be visually monitored at the gravel bar at the downstream end of the action area each day that construction activities disturb the wetted stream channel. This monitoring is necessary to ensure that a significant level of turbidity from construction does not extend beyond the action area. Turbidity will be measured in Nephelometric Turbidity Units (NTU) using a Transparency/Turbidity Tube. Samples will be taken and recorded from a representative area mid channel and median depth: 1) immediately upstream/downstream of the project area before construction begins, and 2) at the gravel bar described above at least one hour after construction begins. If the NTU value exceeds 400, cease construction and contact CMFO for further instruction (see contact above).

4. Should a dead Niangua darter be found during construction, implement the following protocol:
    a. Immediately cease all construction activities. The USACE will consult with the Service to review and reevaluate the conservation measures to prevent additional mortality throughout the remaining project activities.

    b. Contact the Service's law enforcement in St. Peters, Missouri at 636-441-1909 and Bryan Simmons (see above) for consultation, appropriate Service reporting and final deposition of specimens.

c. Any dead Niangua darters should be placed in a clean container with fresh preservative (95% Ethyl Alcohol or 10% buffered formalin) with date, location and project title on a paper label written legibly in pencil or alcohol-proof ink.

5. The area surrounding the pipeline replacement project will be evaluated annually for a minimum of five years following completion. Monitoring efforts should occur in the summer months using referenced photo point(s) for pre-project comparisons. Additional site visits will be necessary immediately following large discharge events beyond a Q2 discharge (bankfull flow with a typical return interval of two years). A copy of this monitoring report/photos will be submitted to the Service which summarizes the following elements:

    a. Bank Erosion
        i. Evaluate each streambank and the island modification to ensure it meets project objectives and that secondary erosion isn't occurring within the utility easement.

    b. Habitat Condition
        i. Conduct general assays in the vicinity of the easement to document any habitat changes, line exposure, loss or formation of suitable Niangua darter habitat (e.g. effects to shallow pool habitat and aquatic vegetation).

    c. Riparian Development
        i. Evaluate the success of erosion control measures and seeding efforts.
        ii. Note limitations of particular actions within the planting area and whether remedial actions are necessary or planned.
        iii. Assess presence/condition of easement and species delineation/signage.

E. Conservation Recommendations

Section 7 (a)(1) of the Act, directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation Recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery programs, or to develop information.

The following recommendations are provided for your consideration, to provide additional conservation benefits for the Niangua darter with its known range.

1. The USACE should continue to coordinate with the Service for proposed permits that occur within the range of the Niangua darter and/or designated critical habitat. Early planning will allow timely initiation of project construction and maximize the potential for benefits to Niangua darters and their habitat. This process would also allow early identification of projects which may affect the species.

2. The USACE should consider erosion control alternatives that incorporate natural channel design elements or bioengineering techniques using principles such as those discussed in Harman and Starr (2011) and NRCS (2007).

3. The USACE should investigate other opportunities along the Niangua River to implement watershed improvement practices. Some examples could include: erosion control projects, improving or expanding native vegetation buffer widths along the stream, and securing conservation easements to ensure long-term protection of designated critical habitat and habitat quality.

4. The USACE should identify other priority areas and habitat improvement projects within Niangua darter range to address habitat/erosion/sedimentation problems.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the BA submitted by the USACE for the potential effects of the Enbridge Pipelines [Ozark] L.L.C. Niangua River Pipeline Replacement Project Line 51, Milepost 243 in Dallas County, Missouri. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this BO; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat designated not considered in this BO; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The RPMs, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If during the course of the action, the level of incidental take described above is exceeded, reinitiation of consultation and review of the RPMs is required. The USACE must immediately provide an explanation of the causes of take and review the need for possible modification of the RPMs with the Service. If you have any questions or comments regarding this Biological Opinion, please contact the Missouri Ecological Services Field Office at 573-234-2132.

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