United States Department of the Interior
FISH AND WILDLIFE SERVICE
East Lansing Field Office (ES)
2651 Coolidge Road, Suite 101
East Lansing, Michigan 48823-6316

IN REPLY REFER TO:

September 19, 2016

Mr. Patrick Marchman
Environment and Realty Program Manager
U.S. Department of Transportation Federal Highway Administration
315 W. Allegan Street, Room 201
Lansing, Michigan 48933

Subject: Reinitiation of Formal Consultation for the I-196 Pier Extension project in the Grand River, Grand Rapids, Kent County, Michigan, Pursuant to Section 7 of the Endangered Species Act.

Dear Mr. Marchman:

Thank you for your email of September 19, 2016, requesting reinitiation of formal consultation for the I-196 Pier Extension project and its effects on the endangered snuffbox mussel (*Epioblasma triquetra*). This project is being supported with federal funding through the Federal Highway Administration (FHWA) while being developed by the Michigan Department of Transportation (MDOT). Your request indicates that due to complications encountered during the relocation survey, the relocation effort is progressing at a much slower rate than originally anticipated. Based on the pace of the relocation survey thus far, the relocation will not be completed before construction activities are scheduled to begin and the close of the mussel relocation season. To ensure the relocation of snuffbox from the action area prior to the close of the relocation season and before construction activities commence, you have proposed changes to the relocation survey methodology. You have requested reinitiation of consultation pursuant to the U.S. Fish and Wildlife Service's (Service) Biological Opinion (Opinion), Log No. 16-R3-ELFO-04, which requires reinitiation if the agency action is subsequently modified in a manner that causes an effect to the listed species not considered in the Opinion.

At present, 1300 m^2 of substrate has been surveyed resulting in the detection and relocation of 633 mussels of 17 different species including 9 snuffbox. The substrate that has been encountered during the relocation effort is significantly more complex than that encountered during the initial semi quantitative and quantitative surveys. This is in part due to differences in survey effort and spatial coverage in 2013 and 2014 versus the relocation survey. Due to the 3-dimensional nature of the substrate encountered during relocation, sampling requires deconstruction of the habitat by moving cobble and boulder by hand, and the use of rakes in moderate to strong current. All of the snuffbox relocated, have been found on the surface of the

substrate in contrast to some of the common species (e.g., *Lampsilis cardium*) burrowed deeper. Given that snuffbox are more easily detected, all but one of the nine snuffbox relocated, have been detected within the first two sampling passes, no snuffbox have been detected beyond the third sampling pass.

The original quantitative survey area was determined by the area of direct impact plus upstream and downstream buffers. The West Virginia Mussel Survey Protocols recommend an upstream buffer of 5 m and a downstream buffer of 10 m for bridge projects. However, after discussions in 2015 and 2016 between MDOT and the Service, both the upstream and downstream buffers were increased to 15 m and 35 m respectively. Given the large scale of the project and the uncertainty of the effects of sedimentation on mussels, the Service and MDOT determined that larger buffers would be the most precautionary approach to avoiding and minimizing impacts to snuffbox.

Given the current progress of the relocation effort and the desire to ensure snuffbox are relocated from the most critical direct and indirect impact areas, you have proposed changes that would reduce the spatial extent of the upstream and downstream buffers and change the required relocation sampling methodology required in the area of direct impact and buffers. We have reanalyzed the effects of the proposed revised action, the current status of snuffbox, the environmental baseline for the action area, and the cumulative effects and conclude that the revised I-196 Pier Extension project is not likely to jeopardize the continued existence of the snuffbox. Attachments A and B include the supporting analysis for our determination as well as new Reasonable and Prudent Measures, Terms and Conditions, and a new Incidental Take Statement. With respect to compliance with the Act, all aspects of the project description are binding. Reasonable and Prudent Measures and the accompanying Terms and Conditions, provided in Attachment A, are nondiscretionary, and are designed to minimize incidental take of listed species.

This concludes formal consultation pursuant to section 7 of the Act. If project plans change or new information about the project becomes available that indicates listed species, proposed species or critical habitat may be affected in a manner or to an extent not previously considered, you should reinitiate consultation with our office.

We greatly appreciate the assistance and cooperation of MDOT and FHWA throughout this consultation process. If you have any questions, please contact Jessica Pruden of this office at 517-351-8245 or Jessica_Pruden@fws.gov.

Sincerely,

Scott Hicks
Field Supervisor

cc: Scott Hanshue, Michigan DNR
Jeff Gabarkiewicz, MDOT

Attachment A: Updated Analysis for Biological Opinion (August 2016) on the I-196 Pier Extension Project, Grand River, Grand Rapids, Michigan.

Background

I-196 crosses the Grand River in Grand Rapids, Kent County, Michigan. The Grand River is approximately 155 meters wide at the project location. The proposed project encompasses the streambed beneath both westbound and eastbound I-196 as well as 45 meters upstream and 35 meters downstream of I-196. Federal funding through the Federal Highway Administration (FHWA) is being provided to the Michigan Department of Transportation (MDOT) to complete the I-196 Pier Extension project. The proposed project will widen the westbound I-196 structure extending the median lane across the structure and upgrade the shoulder widths in accordance with American Association of State Highway and Transportation Officials standards. The expansion will improve the flow of traffic across the structure and increase the safety of the traveling public.

To complete the pier extension, temporary causeways (i.e. east and west causeway) and coffer dams will be constructed. The causeways will be staged over a one year period to ensure that half of the river is open for fish migration. The maximum timeline is January 4, 2017, to August 15, 2018. This would allow the contractor to remove the west causeway during low water minimizing water quality impacts during removal. The pier extension and excavation area is approximately 150 m^2. The construction of the east and west causeways temporarily encompasses in total approximately 10, 664 m^2 of streambed.

The construction sequence for the pier extension will begin with the construction of the east causeway, which requires the placement of heavy rip rap upstream of eastbound 1-196. A turbidity curtain will then be installed adjacent to and just upstream of the 1st heavy rip rap line. The turbidity curtain will then be placed parallel to river flow followed by a second line of heavy rip rap parallel to river flow from the upstream to downstream end. The last turbidity curtain will then be placed on the downstream side perpendicular to river flow followed by the last line of heavy rip rap on the downstream side. After the heavy rip rap and turbidity curtain are installed, well graded rip rap and clean washed 21AA will be added to bring the causeway up to grade. The top width of the causeway will be 8.5 m, side slopes at 1:2, and highest proposed top elevation of 604 ft well below the 100 year flood elevation of 611.3 ft. This process will require two to four weeks. This sequence should help encapsulate the causeway construction area prior to the addition of finer aggregate. Upon installation of the temporary causeway, coffer dams will be installed around the pier excavation areas. Due to the presence of shallow bedrock, the sheeting may have to be braced inside the causeways. All activity within the cofferdams will be isolated from the Grand River.

The following conservation measures will be implemented and are part of the original proposed action:

1. Stage the access road installation over a one year period, leaving half the river open for fisheries migration each year. This should benefit the movement of host fish for snuffbox.

2. Work will not be conducted in the water between the dates of March 1st and June 30th. This should be protective of host fish for snuffbox such as log perch that spawn in late spring.

3. Sequence the construction and removal of the temporary causeway to minimize the suspension and entrainment of find sediments to the maximum extent practicable.

4. Require the use of clean washed aggregate to limit the potential for the suspension and downstream deposition of fine particles.

5. Turbidity curtains will be used to help control the movement of fine sediment.

6. Provide containment for the pier work that will isolate the excavation and construction from the river.

7. Require the disposal of all excavated material outside of the river (i.e., no sidecasting into the river).

8. Relocate snuffbox to a previously identified site upstream of the MDOT project area. All snuffbox will be measured and tagged with a Passive Integrated Transponder (PIT) prior to relocation. Mussels will be transported to the relocation site in an aerated, thermally insulated cooler. Time in the cooler will be minimized to the maximum extent practicable.

9. One or two monitoring events of the relocated mussels will be conducted to document survivorship and growth.

The proposed pier extension project and the mussel survey relocation effort required prior to construction will directly and indirectly impact mussels in the action area. The U.S. Fish and Wildlife Service's (Service) East Lansing Field Office completed a Biological Opinion (Opinion) in August 2016 that anticipated take of up to 152 adult snuffbox as a result of the proposed action.

Mussel surveys were conducted within the action area during the summer of 2013 and 2014 (Cardno JF New and Associates, Inc. 2013 and 2014). In 2013 semi-quantitative visual surveys were only completed between the right downstream bank and the first pier. During the 2013 sampling effort within 15 person hours of visual sampling with a five-person team, samplers encountered snuffbox and discontinued semi-quantitative sampling. During the 2014 sampling effort, semi-quantitative visual surveys were completed in five additional areas. This semi-quantitative visual sampling effort covered a substantially greater area than 2013, but still did not cover the entire survey area. Quantitative surveys (i.e., quadrat excavation along transects) were conducted throughout the entire survey area. Typically, species richness curves are developed to confirm sampling effort adequately represents the number of species present at the project site. However, no species richness curves are available for the survey area.

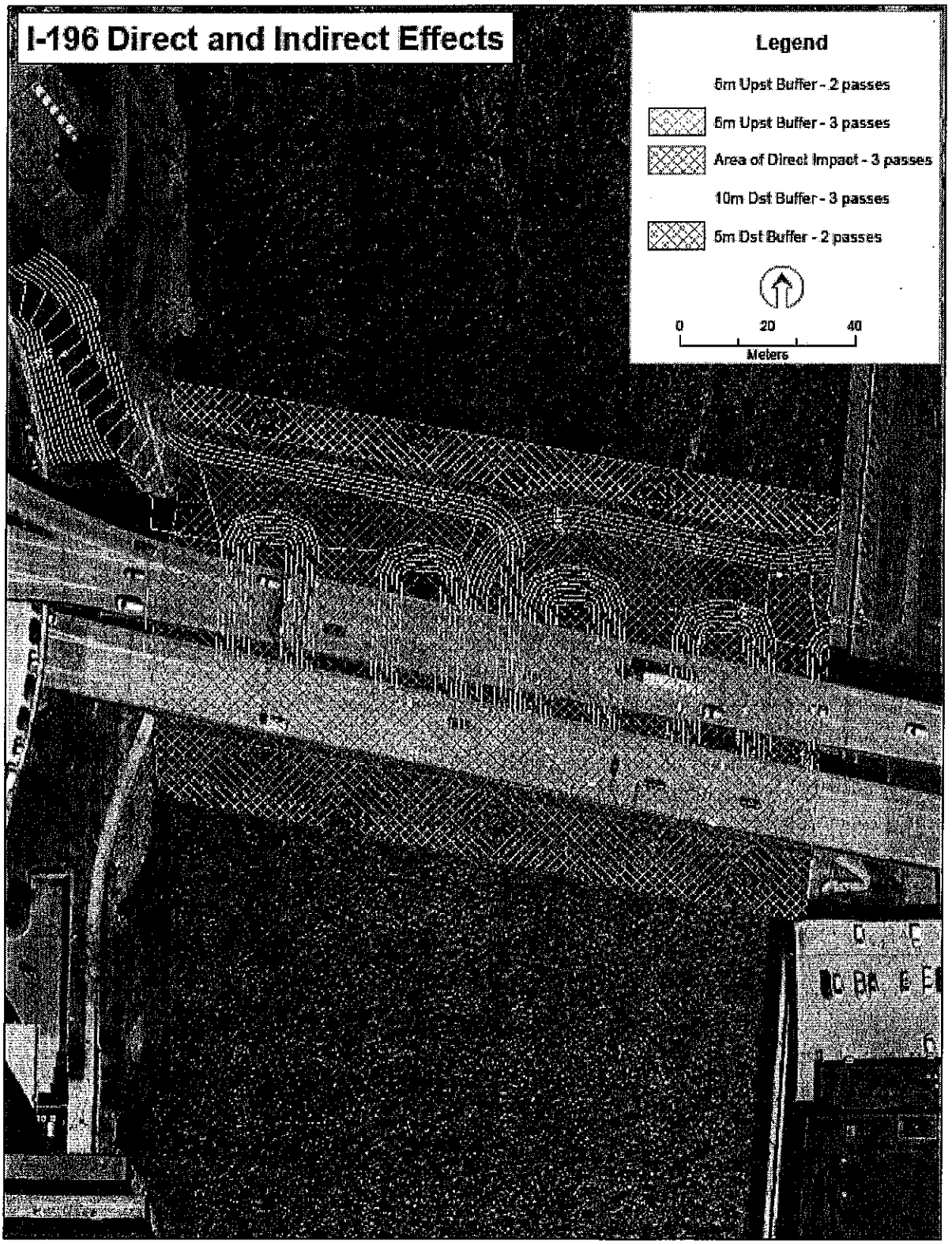
The original survey area was determined by the area of direct impact plus upstream and downstream buffers (calculated to be 80 m by 150 m). However, after discussions in 2015 and 2016 between MDOT and the Service, both the upstream and downstream buffers were increased to 15 m and 35 m respectively. Due to the large scale of the project and the uncertainty of the effects of sedimentation on mussels, the Service and MDOT determined that larger buffers would be the most precautionary approach to avoiding and minimizing impacts to snuffbox.

Data from the original survey was used to predict snuffbox density, mussel community, and substrate composition in the action area (Cardno JF New and Associates, Inc. 2013 and 2014). However, estimates of snuffbox density within the survey area were complicated by low spatial coverage, low population density of snuffbox, and the difference in the level of survey effort within each quadrat compared to the relocation survey effort. At present, 1300 m^2 of substrate has been surveyed resulting in the detection and relocation of 633 mussels of 17 different species including 9 snuffbox. The substrate that has been encountered during the relocation effort is significantly more complex than that encountered during the initial surveys. Due to the 3-dimensional nature of the substrate encountered during current relocation survey effort, sampling requires deconstruction of the habitat by moving cobble and boulder by hand, and the use of rakes in moderate to strong current. All of the snuffbox relocated, have been found on the surface of the substrate in contrast to some of the common species (e.g., *Lampsilis cardium*) burrowed deeper. Given that snuffbox are more easily detected, all but one of the 9 snuffbox relocated, have been detected within the first two sampling passes, no snuffbox have been detected beyond the third sampling pass.

Given the current progress of the relocation effort and the desire to ensure snuffbox are relocated from the most critical direct and indirect impact areas, FHWA proposed changes to the action are (Figure 1):

- Reduce the spatial extent of the buffers upstream and downstream of the area of direct impact to 10 m and 15 m respectively.
- Change the required relocation survey effort to 3 sampling passes in the area of direct impact as well as within the buffered area immediately adjacent to the area of direct impact upstream (5 m) and downstream (10 m).
- Change the required relocation survey effort to 2 sampling passes in the 5 m portion of the upstream buffer at the most upstream extent and the 5 m portion of the downstream buffer at the most downstream extent.

Figure 1: Proposed Changes to Relocation Survey Area and Survey Effort (9/15/16 MDOT)



In light of these proposed changes, on September 19, 2016, the FHWA requested reinitiation of consultation pursuant to the U.S. Fish and Wildlife Service's (Service) August 22, 2016, Biological Opinion (Opinion), Log No. 16-R3-ELFO-04, which requires reinitiation if the agency action is subsequently modified in a manner that causes an effect to the listed species not considered in the Opinion.

Effects of the Action on Snuffbox[1]

Area of Direct Impact

The BA calculates the area of direct impact to be 10, 814 m^2. The BA includes an estimated density of snuffbox ranging from .002-.008 snuffbox/ m^2 in the survey area. This density estimate was based on semi-quantitative and quantitative survey effort in 2013 and 2014. The Service and MDOT agreed that the density estimate based on quantitative survey effort (.008 snuffbox/ m^2) was the most representative of the predicted density of snuffbox across the action area and used this in the Services' Opinion to estimate incidental take of snuffbox as a result of the proposed action. However, the initial relocation survey data is likely more representative of the likely density of snuffbox in the action area than the previous estimates. Therefore, we have recalculated the density of snuffbox in the action area at .0069 snuffbox/ m^2. As such, 75 snuffbox are present within the area of direct impact.

In addition the FHWA has proposed a revision to the relocation sampling methodology in the area of direct impact. The revised survey effort will require 3 sampling passes in the area of direct impact versus the methodology in the Services' Opinion which required multiple passes to be made through the area until less than 5% percent of the number of snuffbox collected on the original pass are recovered on the final pass. The revised method of survey effort is based on the current relocation survey data. Within 1300 m^2 of substrate that has been surveyed, all of the snuffbox relocated, have been found on the surface of the substrate. This is in contrast to some of the common species (e.g., *Lampsilis cardium*) that have been found burrowed deeper and in some cases have resulted in detection after 8 sampling passes. Given that snuffbox are more easily detected, all but one of the 9 snuffbox relocated, have been detected within the first two sampling passes, no snuffbox have been detected beyond the third sampling pass. The snuffbox relocation effort associated with the Lyons Dam removal in the Grand River, Lyons, Michigan, similarly always detected snuffbox within the first 3 sampling passes despite searching the relocation areas until zero mussels were found (Woolnough 2015). This was consistent across the Lyons relocation areas that had both low and high snuffbox densities. Nevertheless, finding and relocating all mussels is highly unlikely. Mussels may be overlooked especially juvenile mussels and any mussels that have burrowed deep into the substrate may not be found. Given that the 80% detection rate is based on the survey data from Lyons, changing the method of survey effort to 3 sampling passes within the area of direct impact for the proposed project should not affect the number of snuffbox detected. It is likely it will result in the detection and relocation of a lower number of common species that seem to be deeper in the substrate. Based on the presence of 75 snuffbox in the area of direct impact, 3 sampling passes will result in the detection and relocation of 60 snuffbox.

[1] See Attachment B for Calculations for the Revised Incidental Take Estimates for Reinitiation of the Biological Opinion on the I-196 Pier Extension Project

Those mussels remaining in the construction zones in the area of direct impact (i.e., snuffbox that could not be detected during relocation activities) will experience harm or mortality from crushing, suffocation, or desiccation. Mussels could be crushed, smothered, or removed during installation of the causeways as well as excavation around the piers. Mussels may also suffer mortality due to desiccation when cofferdam areas are dewatered. After relocation of mussels, we estimate 15 snuffbox will remain in the construction zones. These mussels will likely be lost from the population due to construction activities.

Areas Indirectly Affected (Upstream and Downstream Buffer Areas)
Mussels outside of the area of direct impact, but within adjacent areas extending 15 m upstream and 35 m downstream will be indirectly affected by construction activities. The total area where indirect effects are likely is 8,092 m^2. The proposed reduction in the upstream and downstream buffer areas will result in a smaller relocation survey area within the larger areas indirectly affected by construction activities. The spatial extent of the upstream buffer will be reduced from 15 m to 10 m and the downstream buffer will be reduced from 35 m to 15 m. As such, of the total area indirectly affected by construction activities (8,092 m^2), 3,875 m^2 will be surveyed for mussel relocation and 4,217 m^2 will not be surveyed. Furthermore, within the buffer relocation survey area (3,875 m^2), the level of survey effort will vary depending on distance from the area of direct impact. The revised survey effort will require 2 sampling passes in the 5 m portion of the upstream buffer at the most upstream extent and the 5 m portion of the downstream buffer at the most downstream extent (total area = 1550 m^2). In contrast to the upstream buffer within 5 m immediately adjacent to the area of direct impact, and the downstream buffer within 10 m immediately adjacent to the area of direct impact where 3 sampling passes will still be required (total area = 2325 m^2).

The West Virginia Mussel Survey Protocols recommend an upstream buffer of 5 m and a downstream buffer of 10 m for bridge projects. The proposed changes to the buffers are in accordance with the Protocols. However, as previously mentioned, due to the large scale of the project and the uncertainty of the effects of sedimentation on mussels, the Service and MDOT determined that larger buffers would be the most precautionary approach to avoiding and minimizing impacts to snuffbox. Take will still occur throughout the original buffer area, though due to the proposed changes in the buffers and the change in the relocation survey effort methodology in a portion of this area, a lower number of snuffbox will be detected and relocated from areas indirectly affected by the proposed project.

Based on a density of .0069 snuffbox/ m^2 56 snuffbox are present within the areas indirectly affected by the proposed construction. With respect to relocation sampling methodology, we assume that 3 sampling passes = 80% detection rate and 2 sampling passes = 72% detection rate. As such, of the 56 snuffbox present, 21 will be relocated from the indirect affect areas to the Lowell relocation site. Post relocation mortality is estimated to be 5% resulting in 4 snuffbox mortalities following relocation activities.

Snuffbox that are indirectly affected that are undetected during relocation or in the areas where there will be no relocation survey effort, will remain in the area and suffer harm and harassment due to interference with normal respiration, feeding, and reproduction. These effects are likely to occur as a result of construction activities that have the potential to increase sedimentation and

channel shear stress, as well as chemical exposure. Haul road aggregate and stream bed substrate may be sources of fine sediment that are suspended and entrained during causeway construction, maintenance, and removal activities. An increase in the level of suspended sediments may negatively impact mussels by interfering with respiration, feeding, and reproduction as well as reduce streambed habitat quality. To minimize sedimentation careful consideration was given to haul road design, use of a turbidity curtain, and the installation/ removal sequence. Furthermore, very little silt was documented on the streambed in this area (Kogge 2013; Richardson 2014). In addition, to sedimentation, the presence of the temporary causeways will result in channel constriction and it is possible there may be an increase in channel shear stress. This has the potential to cause displacement of mussels which may also interfere with feeding, reproduction, and result in movement of mussels into potentially sub-optimal habitat. Lastly, mussels have the potential to be exposed to chemicals due to an accidental fuel spill, which depending on the severity could result in mortality.

We estimate that 35 snuffbox will remain after relocation or due to lack of relocation survey effort in certain areas, and will be harmed and harassed due to interference with normal respiration, feeding, and reproduction. The severity of impacts is dependent on flow, rainfall, effectiveness of best management practices (e.g., turbidity curtains, construction materials and sequencing etc.), and the sensitivity and response of snuffbox to disturbance. It is impossible to quantify how many individuals will suffer mortality and how many will suffer less severe short term effects but the total number affected will not exceed 35 individuals in these indirect affect areas.

Hydraulic effects post construction due to the pier lengthening were considered, but are deemed to be negligible due to the very large surface area of the riverbed and banks when compared to the relatively short lengthening and surface area of piers 16-19.

Summary of Effects

In total, 131 snuffbox are estimated to be present in both the area of direct impact and areas indirectly affected by the proposed project. Of the 131 snuffbox present, 81 will be relocated to Lowell. Relocation will also result in mortality of some mussels. Success of mussel relocations, in terms of recovery and survival of mussels, depends on several factors, including substrate stability, microhabitat requirements, methods of relocation, and timing (Cope and Waller 1995, Cope *et al.* 2003, Dunn and Sietman 1997, Dunn *et al.* 2000, Hamilton *et al.* 1997). Relocations with low mortality (< 1%) after one year have been linked to relocation sites with stable or consolidated substrate, species-specific habitat requirements, and careful handling of mussels (Dunn and Sietman 1997). The relocation site in Lowell has high quality mussel habitat and snuffbox present indicating that the relocation site should provide the necessary substrate and microhabitat features for snuffbox relocation. The relocation will be conducted in accordance with the Michigan Mussel Survey Protocols (Hanshue *et al.* 2016). Based on this information, we expect a high survival rate although other unknown or uncontrollable factors may influence survival. Following the relocation guidelines in Dunn *et al.* (2000), we assume a 5 % mortality rate for relocated mussels is an appropriate estimate that will still reflect a high degree of success for the relocation. Based on this, we anticipate that 4 relocated snuffbox will not survive one year after relocation. Lastly, of the 131 snuffbox present, 50 will suffer mortality due to lack of detection and lack of survey effort in a portion of the area indirectly affected.

Jeopardy Analysis

After reviewing the current status of snuffbox, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, we conclude that the I-196 Westbound Pier Extension project, as proposed, is not likely to jeopardize the continued existence of the snuffbox. No critical habitat has been designated for this species; therefore, none will be affected.

Regulations define "jeopardize the continued existence of a species" as "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." We must analyze how the proposed action and potential effects could impact reproduction, number, and distribution of snuffbox.

A loss of up to 50 individuals will reduce the number of reproductive adults in the river. Additionally, harassment of 81 adult mussels may interfere with normal breeding activity, potentially reducing the number of glochidia produced in the year of relocation. This temporary and short term potential disruption to reproduction among relocated snuffbox will not detectably reduce the overall reproductive success of the snuffbox population in the Grand River.

A loss of up to 50 individuals will reduce the number of mussels in the river. The total snuffbox population estimated within the action area based on the revised snuffbox density of .0069 snuffbox/ m^2 is 131. Thus, permanent loss of 50 individuals represents 38.1% of the localized population in the action area. In addition, 81 individuals representing 61.8 % of the localized population will be permanently removed from the action area and moved to the relocation site in Lowell. While these individuals will not be lost from the snuffbox population as a whole in the Grand River, they will be permanently displaced from the localized population in the action area. The Restore the Rapids Project predicts an increase in the amount of available mussel habitat following completion of the project. If this is the case, it is possible that the loss of individuals from the localized population as a result of this project will be mitigated by the creation and recovery of snuffbox population throughout the action area and downtown Grand Rapids. We do not have a total population estimate for snuffbox in the Grand River. However, the potential viability is considered high with documented recruitment and a medium size population. In one reach of the Grand River in the Village of Lyons, Ionia County, Michigan, surveys revealed a localized population estimate of 11,488 snuffbox and there is evidence of recruitment. Recently, an additional population in the Maple River, a tributary to the Grand River, was discovered (D. Woolnough, CMU, pers. comm. 2016). While snuffbox presence and density is variable throughout the Grand River, there are areas where snuffbox density is significant in this river (USFWS Biological Opinion for the Removal of Lyons Dam, August 17, 2015). Data from the Grand Rapids Revitalization Project indicate that snuffbox in the action area are part of a larger population present throughout the downtown reach of the Grand River. The Grand Rapids Revitalization Project proposes to improve the mussel habitat throughout this reach of the river, which includes the action area. As such, future actions may in fact improve snuffbox habitat and possibly density in this area. For these reasons, we conclude that the proposed action, taken together with cumulative effects, would not directly or indirectly reduce the likelihood of both

the survival and recovery of the snuffbox by reducing the species' reproduction, numbers, or distribution.

Revised 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 or 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 intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. 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 FHWA so that they become binding conditions of any funding awarded to the project, as appropriate, for the exemption in section 7(o)(2) to apply. The FHWA has a continuing duty to regulate the activity covered by this incidental take statement. If the FHWA fails to assume and implement the terms and conditions of the incidental take statement, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the FHWA 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)]

Amount or Extent of Take
The Service anticipates up to 131snuffbox could be taken as a result of this proposed action. We expect incidental take of 81 adults will occur in the form of harassment as a result of relocation. Incidental take of 50 adults will occur in the form of mortality, including 4 post-relocation mortalities.

Table 1. Number of snuffbox mussels impacted as a result of I-196 Pier Extension Project as described in the Opinion and as estimated based on the proposed changes to the relocation survey.

Incidental Take	Original Biological Opinion Estimate	New Take Estimate For Reinitiated Consultation
Total number of individuals incidentally taken	152	131
# harassed out of total	122	81
Total # mortalities	36	50
# of mortalities out of total mortalities due to construction related impacts	30	46
# of mortalities out of total mortalities due to 5% post relocation mortality	6	4

Effect of Take

In this analysis that will amend the Opinion for the I-196 Pier Extension Project, we determined that the level of anticipated take for the revised proposed action is not likely to result in jeopardy to the species.

Revised Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize the incidental take of snuffbox during the revised proposed action:

1. The FHWA will ensure that the proposed project components will occur as planned and as documented in the BA, Services' August 22, 2016, Opinion on the I-196 Pier Extension Project, and the documentation associated with the reinitiated formal consultation.

2. The FHWA will ensure that qualified mussel biologists relocate snuffbox within the 14,689 m^2 project impact area, as defined in the "Effects of the Action on Snuffbox" section of this document (Attachment A: Updated Analysis for Biological Opinion (August 2016) on the I-196 Pier Extension Project, Grand River, Grand Rapids, Michigan).

3. The FHWA will ensure that qualified mussel biologists monitor the relocated mussels after relocation.

4. The FHWA will report on the progress of the I-196 Pier Extension Project and its impact on the snuffbox, as required pursuant to 50 CFR 402.14(i)(3).

5. The FHWA will ensure that during construction activities in the action area, water quality standards are in accordance with their MDEQ National Pollutant Discharge Elimination System permit.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Service must comply with the following terms and conditions, which implement the reasonable and prudent measures, described above, and outline reporting/monitoring requirements. These terms and conditions are non-discretionary.

Terms and Conditions to fulfill RPM #1

1.1 Notify contractors of conservation measures and ensure compliance with these measures.

1.2 Submit a report to our office within 60 days of completing the I-196 Pier Extension project. This report will describe the actions taken to implement the terms and conditions and include the dates of actual construction activities.

Terms and Conditions to fulfill RPM #2

2.1 Ensure relocation follows the West Virginia Survey Protocols, including:

- Snuffbox shall be collected by hand, by "grubbing" while wading or snorkeling in shallow water, or by divers in deeper water.
- Relocation effort shall be systematically conducted by a "moving transect" or establishing cells not to exceed 100 m^2.
- Effort shall meet the same standards as surveys, using standards for visual or surface searches.
- Three sampling passes shall be made through the area to recover snuffbox mussels.
- Both valves of each snuffbox will be marked with shellfish tags.
- All snuffbox will be tagged with a Passive Integrated Transponder (PIT).

2.2 Submit a report to our office within 60 days of completion of snuffbox relocation. This report should describe the actions taken to implement the terms and conditions and include the dates of activities.

Terms and Conditions to fulfill RPM #3

3.1 Ensure post-relocation monitoring surveys are conducted one year following relocation. Post relocation monitoring surveys should follow West Virginia Survey Protocols for monitoring.

3.2 Submit a report to our office within 30 days of completion of the snuffbox post-relocation monitoring events. This report should describe the actions taken to implement the terms and conditions and include the dates of activities.

Terms and Conditions to fulfill RPM #5

5.1 Notify the ELFO if NPDES permit limits are exceeded.

5.2 Notify the ELFO if an accidental spill during construction results in chemical exposure in the river.

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 plans, or to develop information. The Service has identified the following actions that, if undertaken by the FHWA, will further the conservation and assist in the recovery of snuffbox:

1. Conduct additional years of post-relocation monitoring to assess future survival and growth rates of relocated mussels.

2. Conduct or fund augmentation and/or reintroduction efforts for snuffbox within the Grand River watershed.

3. Support research on snuffbox ecology, distribution, and effects of sedimentation.

In order to keep the Service informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

Reinitiation Notice

This concludes reinitiation of formal consultation on the revised proposed action. In accordance with 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 opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; 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.

We believe that no more than 131 snuffbox will be incidentally taken as a result of the proposed action. This includes harassment of 81 individuals during relocation prior to construction and mortality of 50 adults, 4 of which are associated with relocation. If any of the following occurs during the course of completing the project, then this represents new information, requiring reinitiation of consultation:

1. Fewer than 81 snuffbox are captured and removed prior to construction.

2. More than 131 snuffbox are captured and removed prior to construction.

References

U.S. Fish and Wildlife Service (USFWS). 2016. Biological Opinion for the I-196 Pier Extension Project, Grand Rapids, Michigan; Log No. 16-R3-ELFO-04.

Woolnough, D.A. 2015. Relocation of Snuffbox (*Epioblasma triquetra*) in Grand River Lyons, MI: Endangered Species Act Section 7 Permit Requirements.

Attachment B: Calculations for the Revised Incidental Take Estimates for Reinitiation of the Biological Opinion on the I-196 Pier Extension Project

Methodology applicable to all calculations below: Estimates for relocation are based on a detection rate of 80% and 20% that cannot be detected and thus left behind expressed as mortality from construction related impacts. Density was calculated based on the number of snuffbox detected during the initial relocation survey effort within 1300 m^2 of the relocation survey area. Therefore, the number found represent 80% detected within 3 sampling passes. The total number of snuffbox likely present in the area was determined in order to calculate the 20% that could not be detected, estimated as mortality. The relocation survey data was also used to calculate the number of snuffbox likely to be detected in areas where 2 sampling passes are used versus 3 sampling passes.

Detection rates and snuffbox density calculated from the Relocation Survey Area as of 9/10/16

Area = m^2

9 snuffbox were found within 1300 m^2 relocation survey area

9/1300 = .0069 snuffbox/ m^2

1300*.0069 = based on 80% detection rate 8.97 snuffbox found

80% detection rate = 3 sampling passes

8/9 snuffbox were detected within 2 sampling passes

72% detection rate = 2 sampling passes

Area of Direct Impact

Area = 10,814 m^2

Snuffbox density = .0069 m^2

80% detection rate = 3 sampling passes

10,814*.0069 = 75 snuffbox present in the area of direct impact

75 *.8 = 60 snuffbox detected

75-60 = 15 snuffbox mortalities

Areas Indirectly Affected (Upstream and Downstream Buffers)

Total area indirectly affected that will not be surveyed = 4,217 m^2

Snuffbox density = .0069 m^2

4,217 *.0069 = 29 snuffbox mortalities

Areas indirectly affected where 3 sampling passes (assumed detection rate of 80%) will be applied = 2,325 m^2

2,325 *.0069 = 16 snuffbox present

16 *.8 = 13 snuffbox detected

16-13 = 3 snuffbox mortalities

Areas indirectly affected where 2 sampling passes will be applied = 1,550 m^2

72% detection rate = 2 sampling passes

1,550 *.0069 = 11 snuffbox present

11 *.72 = 8 snuffbox detected

11-8 = 3 snuffbox mortalities

Total Estimated Take For the Proposed Action

Total number of snuffbox present from the calculations above for: Area of Direct Impact + Areas Indirectly Affected = 131 Total snuffbox incidentally taken.

Total Number of Snuffbox Detected: Area of Direct Impact + Area Indirectly Affected with 3 sampling passes + Area Indirectly Affected with 2 sampling passes = 81 snuffbox relocated.

Total Snuffbox Mortality Resulting from Inability to Detect and Lack of Survey Effort: Area of Direct Impact + Area Indirectly Affected with 3 sampling passes + Area Indirectly Affected with 2 sampling passes + Area Indirectly Affected with No Relocation Survey Effort = 50 snuffbox mortalities due to construction related impacts and lack of survey effort.

Total Number of Snuffbox Mortality Resulting from Post Relocation Mortality

Post relocation mortality is expected to be 5%

81*.05 = 4 snuffbox post relocation mortalities

Total Estimated Take = 131 adult snuffbox

Total estimated incidental take due to relocation = 81 adult snuffbox

Total estimated take mortality = 50 adult snuffbox mortalities (50 snuffbox mortalities due to construction related impacts and 4 snuffbox post relocation mortalities).