



⊠ North Carolina Wildlife Resources Commission ⊠

Gordon Myers, Executive Director

MEMORANDUM

TO: Pamela R. Williams.
Transportation Program Management Unit, NCDOT

FROM: Travis Wilson, Highway Project Coordinator
Habitat Conservation Program

DATE: July 13, 2012

SUBJECT: Division 5 Bridge Replacements

Biologists with the N. C. Wildlife Resources Commission (NCWRC) have reviewed the information provided and have the following preliminary comments on the subject project. Our comments are provided in accordance with provisions of the National Environmental Policy Act (42 U.S.C. 4332(2) (c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

Our standard recommendations for bridge replacement projects of this scope are as follows:

1. We generally prefer spanning structures. Spanning structures usually do not require work within the stream and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges allows for human and wildlife passage beneath the structure, does not block fish passage, and does not block navigation by canoeists and boaters.
2. Bridge deck drains should not discharge directly into the stream.
3. Live concrete should not be allowed to contact the water in or entering into the stream.
4. If possible, bridge supports (bents) should not be placed in the stream.
5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary

structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.

6. A clear bank (riprap free) area of at least 10 feet should remain on each side of the stream underneath the bridge.
7. In trout waters, the N.C. Wildlife Resources Commission reviews all U.S. Army Corps of Engineers nationwide and general '404' permits. We have the option of requesting additional measures to protect trout and trout habitat and we can recommend that the project require an individual '404' permit.
8. In streams that contain threatened or endangered species, NCDOT biologist Mr. Logan Williams should be notified. Special measures to protect these sensitive species may be required. NCDOT should also contact the U.S. Fish and Wildlife Service for information on requirements of the Endangered Species Act as it relates to the project.
9. In streams that are used by anadromous fish, the NCDOT official policy entitled "Stream Crossing Guidelines for Anadromous Fish Passage (May 12, 1997)" should be followed.
10. Sedimentation and erosion control measures sufficient to protect aquatic resources must be implemented prior to any ground disturbing activities. Structures should be maintained regularly, especially following rainfall events.
11. Temporary or permanent herbaceous vegetation should be planted on all bare soil within 15 days of ground disturbing activities to provide long-term erosion control.
12. All work in or adjacent to stream waters should be conducted in a dry work area. Sandbags, rock berms, cofferdams, or other diversion structures should be used where possible to prevent excavation in flowing water.
13. Heavy equipment should be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams.
14. Only clean, sediment-free rock should be used as temporary fill (causeways), and should be removed without excessive disturbance of the natural stream bottom when construction is completed.
15. During subsurface investigations, equipment should be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

If corrugated metal pipe arches, reinforced concrete pipes, or concrete box culverts are used:

1. The culvert must be designed to allow for aquatic life and fish passage. Generally, the culvert or pipe invert should be buried at least 1 foot below the natural streambed (measured from the natural thalweg depth). If multiple barrels are required, barrels other than the base flow barrel(s) should be placed on or near stream bankfull or floodplain bench elevation (similar to Lyonsfield design). These should be

reconnected to floodplain benches as appropriate. This may be accomplished by utilizing sills on the upstream and downstream ends to restrict or divert flow to the base flow barrel(s). Silled barrels should be filled with sediment so as not to cause noxious or mosquito breeding conditions. Sufficient water depth should be provided in the base flow barrel(s) during low flows to accommodate fish movement. If culverts are longer than 40-50 linear feet, alternating or notched baffles should be installed in a manner that mimics existing stream pattern. This should enhance aquatic life passage: 1) by depositing sediments in the barrel, 2) by maintaining channel depth and flow regimes, and 3) by providing resting places for fish and other aquatic organisms. In essence, base flow barrel(s) should provide a continuum of water depth and channel width without substantial modifications of velocity.

2. If multiple pipes or cells are used, at least one pipe or box should be designed to remain dry during normal flows to allow for wildlife passage.
3. Culverts or pipes should be situated along the existing channel alignment whenever possible to avoid channel realignment. Widening the stream channel must be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.
4. Riprap should not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be professionally designed, sized, and installed.

In most cases, we prefer the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure should be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed down to the natural ground elevation. The area should be stabilized with grass and planted with native tree species. If the area reclaimed was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be utilized as mitigation for the subject project or other projects in the watershed.

Project specific comments:

- Durham County Bridge #8 over Flat River on SR 1602: Our records indicate the potential for multiple state listed species to be present at this site including: Creeper (*Strophitus undulatus*: state T), Eastern lampmussel (*Lampsilis radiata*: state T), Yellow lampmussel (*Lampsilis cariosa*: state E, FSC) and Green floater (*Lasmigona subviridis*: state E, FSC). Due to the high diversity of listed species we recommend NCDOT follow the Design Standards for Sensitive Watersheds during the design and construction of this project. We recommend replacing this bridge with a bridge. Standard recommendations apply.
- Durham County Bridge #85 over Little Lick Creek on SR 1814: We recommend replacing this bridge with a bridge. Standard recommendations apply.
- Durham County Bridge #93 over Rocky Creek on SR 1945: We recommend replacing this bridge with a bridge. Standard recommendations apply.

- Durham County Bridge #118 over Pond on US 501: We recommend replacing this bridge with a bridge. Standard recommendations apply.
- Granville County Bridge #130 over Little Johnson Creek on SR 1300: We recommend replacing this bridge with a bridge. Standard recommendations apply.
- Granville County Bridge #142 over Grassy Creek on SR 1431: We recommend replacing this bridge with a bridge. Standard recommendations apply.
- Granville County Bridge #224 over Beaver Creek on SR 1501: We recommend replacing this bridge with a bridge. Standard recommendations apply.
- Vance County Bridge #85 over Little Island Creek on SR 1348: We recommend replacing this bridge with a bridge. Standard recommendations apply.
- Wake County Bridge #67 over Bachelor Branch of White Oak Creek on SR 1615: We recommend replacing this bridge with a bridge. Standard recommendations apply.
- Wake County Bridge #121 over Horse Creek on SR 1909: We recommend replacing this bridge with a bridge. Standard recommendations apply.
- Wake County Bridge #122 over Richland Creek on SR 1931: There is a Clean Water Management Trust Fund conservation easement located adjacent to the project; DOT should minimize impacts to this area during the design and construction of this project. We recommend replacing this bridge with a bridge. Standard recommendations apply.
- Wake County Bridge #130 across Sanford Creek on SR 2049: We recommend replacing this bridge with a bridge. Standard recommendations apply.
- Wake County Bridge #132 over Smith Creek on SR 2052: We recommend replacing this bridge with a bridge. Standard recommendations apply.
- Wake County Bridge #161 over Cedar Fork Creek on SR 2300: Our records indicate the potential for state and federally listed species to be present in close proximity to this site at the confluence with Little River: Green floater (*Lasmigona subviridis*: state E, FSC) and historic downstream records of Dwarf wedgemussel (*Alasmidonta heterodon*: state E, federal E). NCDOT should conduct a field survey to determine presence or absence of these species and their habitat. We recommend replacing this bridge with a bridge. Standard recommendations apply.
- Wake County Bridge #162 over Little River on SR 2224: Our records indicate the potential for state and federally listed species to be present at this site including: Green floater (*Lasmigona subviridis*: state E, FSC) and historic downstream records of Dwarf wedgemussel (*Alasmidonta heterodon*: state E, federal E). NCDOT should conduct a field survey to determine presence or absence of these species and their habitat. We recommend replacing this bridge with a bridge. Standard recommendations apply.
- Wake County Bridge #526 over Moccasin Creek on SR 2406: We recommend replacing this bridge with a bridge. Standard recommendations apply.

If you need further assistance or information on NCWRC concerns regarding bridge replacements, please contact me at (919) 528-9886. Thank you for the opportunity to review and comment on this project.