

**STREAM CROSSING GUIDELINES  
FOR ANADROMOUS FISH PASSAGE**

Anadromous Fish are a valuable resource and their migration must not be adversely impacted. The purpose of this document is to provide guidance to the North Carolina Department of Transportation to ensure that replacement of existing and new highway stream crossing structures will not impede the movement of Anadromous Fish.

**Applicable When:**

- o Project is in the coastal plain defined by the "Fall Line" as the approximate western limit (see attached figure).
- o For perennial and intermittent streams delineated on most recent USGS 7.5 minute quadrangle maps.

**General Guidelines:**

- o Design and scheduling of projects should avoid the necessity of instream activities during the spring migration period. For the purposes of these guidelines "Spring" is considered to fall between February 15 and June 15. (In areas where the shortnose sturgeon may be present, the Cape Fear, Brunswick and Waccamaw Rivers, spring shall be defined as February 1 to June 15).
- o Bridges and other channel spanning structures are preferred where practical.

**Technical Guidelines:**

- o In all cases, the width, height and gradient of the proposed opening shall be such as to pass the average historical spring flow without adversely altering flow velocity. Spring flow should be determined from gage data if available. In the absence of this data, bankfull flow can be used as a comparative level. (Reference, "Fisheries Handbook of Engineering Requirements and Biological Criteria", Bell 1973, for fish swimming limitations.)
- o The invert of culverts shall be set at least one foot below the natural stream bed.

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- o Crossings of perennial streams serving watersheds greater than one square mile shall provide a minimum of four (4) feet of additional opening width (measured at spring flow elevation) to allow for terrestrial wildlife passage.
- o In stream footings for bridges will be set one foot below the natural stream bed when practical.

For crossing sites which require permit review the following information will be provided as a minimum to facilitate resource agency review.

- o Plan and profile views showing the existing and proposed crossing structures in relation to the stream bank and bed.
- o Average historical spring flow (or bankfull flow) for the site.
- o How the proposed structure will affect the velocity and stage of the spring flow (bankfull).
- o Justification for any variance from the guideline recommendations.

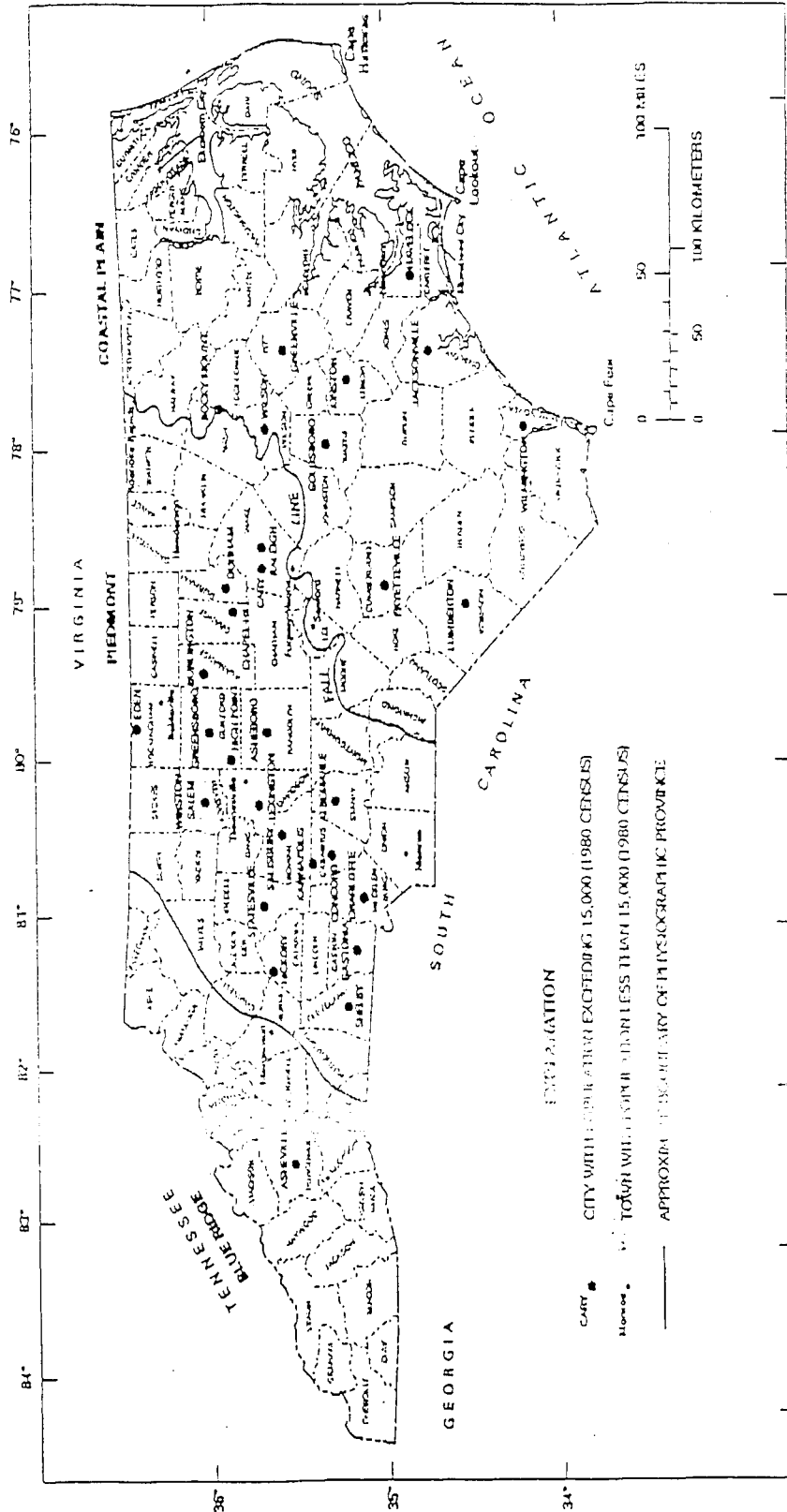


Figure 2. Counties and major population centers of North Carolina.