

United States
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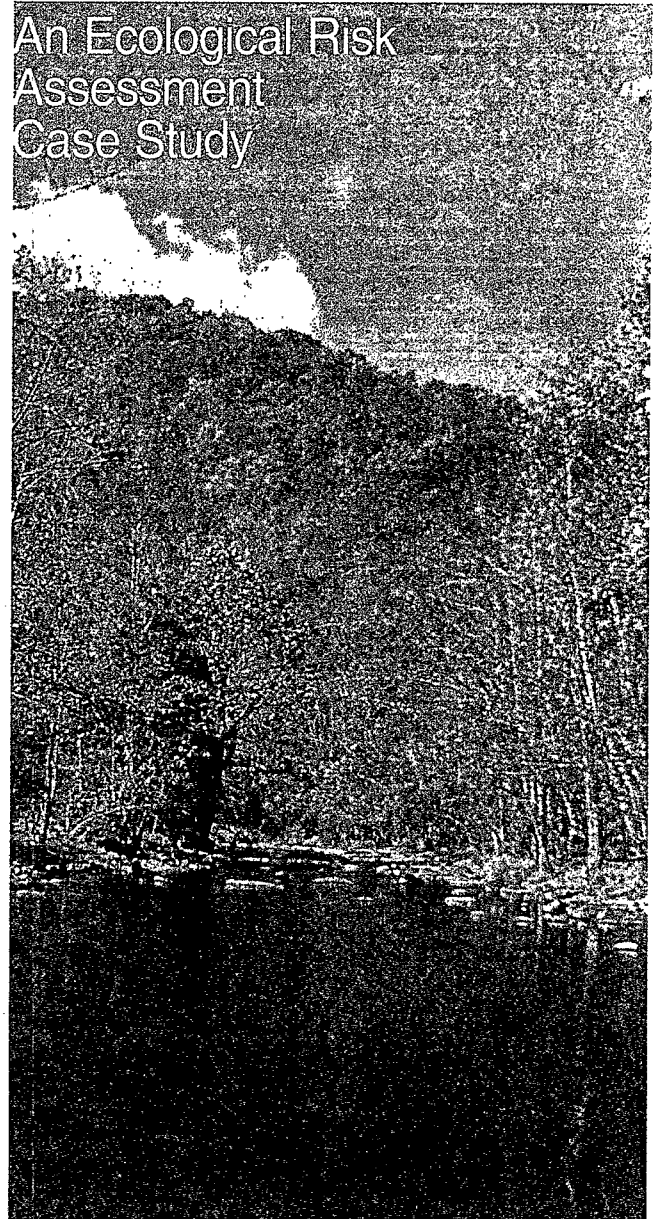
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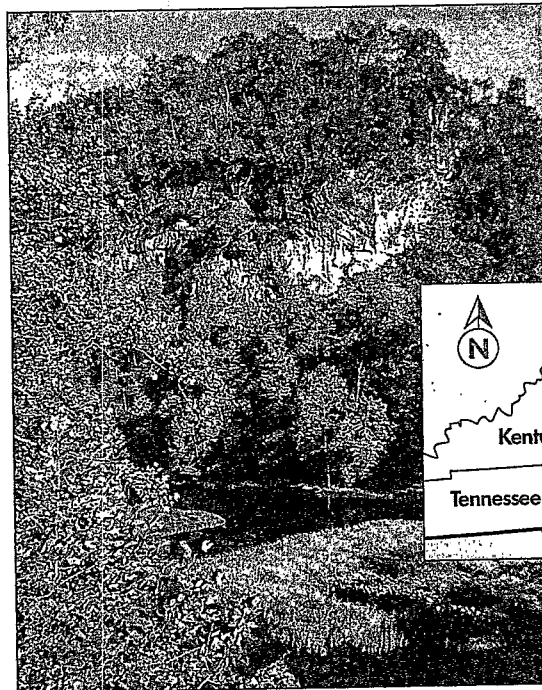
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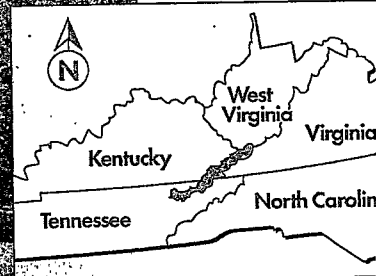
Clinch River Watershed

An Ecological Risk
Assessment
Case Study





The Nature Conservancy



CLINCH RIVER AT PENDLETON ISLAND.

The topography of the Clinch River Basin is characterized by dramatic relief, with steep, irregular mountains and valleys. Geologically, large expanses of limestone and dolomite are present, resulting in karst regions (regions with sink holes, sinking streams and caves).

What is an ecological risk assessment?

An ecological risk assessment evaluates the potential adverse effects of human activities on the plants and animals that make up ecosystems. The risk assessment process provides a way to develop, organize and present scientific information so it is relevant to environmental decisions. When conducted for a particular place such as a watershed, the ecological risk assessment process can be used to identify vulnerable and valued resources, prioritize data collection activities, and link human activities with their potential effects. Risk assessments provide a focal point for cooperation among local communities and state and federal government agencies, and a basis for comparing various management options.

Why is the Clinch River special?

The Clinch River above Norris Lake is one of the largest free-flowing segments of the Tennessee River drainage basin with a length of 320 kilometers (200) miles. At Norris Lake the Clinch is joined by the Powell River, and continues to flow in a south-westerly direction, eventually joining the Tennessee

The Clinch River originating in Virginia, flows southwest to where it is joined by the Powell River at Norris, Tennessee.



River near the town of Harriman, TN.

The watershed drains approximately 7,600 km² (2900 square miles). The assemblage of fish and freshwater mussel species in the Clinch River is among the most diverse and unique in North America. In fact, many of the native mussel species are found nowhere else. The Clinch River harbors at least 4 fish and 18 mussel

species that are either federally endangered, threatened or are candidates for protection under the Endangered Species Act. The Nature Conservancy—an international resource conservation organization—has established the Clinch Valley Bioserve to conserve biological diversity in the Clinch River watershed while continuing to meet social and economic needs. A partnership has been formed between public and private organizations that share a goal of preserving or restoring the valuable natural resources of the watershed while maintaining its economic uses.



Bill Henley

FEMALE WAVY-RAYED MUSSEL (LAMPSILIS FASCIOLA)

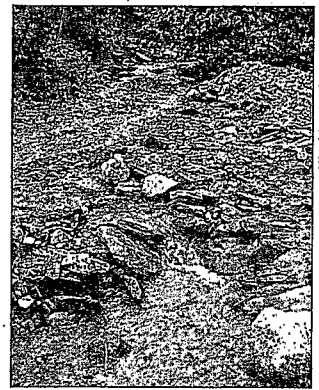
Many mussel species in the Clinch river are endangered. Mussels require clean, clear water and silt-free gravel or cobble to survive.

How can this valuable resource be protected?

This ecological risk assessment will analyze the stressors and resulting ecological effects in the Clinch River watershed. The assessment promotes community awareness of ecological problems in the watershed and will provide information to resource managers, including government officials, organizations and the public. These activities promote environmentally beneficial results.

How is the ecological risk assessment being done?

Interested organizations collectively developed a management goal and a scientific study approach. The ecological risk assessment brought together numerous organizations to analyze the impact of stressors on the watershed. Measurements of watershed condition will be plotted on maps and related to land use within the watershed. Relationships between the stressors caused by land use activities and effects on fish and aquatic invertebrates will be examined. This will provide information to estimate risks associated with land-use decisions. A report describing the management goals for the Clinch River watershed and the analysis plan for the assessment will be available upon completion of the analysis described above.



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Nonpoint source pollution, (discharge not from a fixed source, such as a pipe or smokestack) including acid mine drainage, has been identified as the most severe cause of water pollution in the Clinch Valley. Resource managers can work with local land users to improve agricultural and mining practices to decrease sediment loading.

Key stressors being evaluated in the ecological risk assessment are:

- habitat disruption
- sedimentation
- chemical contamination



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How will the results be used?

Agriculture is a critical component of the social and economic fiber of the region. Some pasture and row crop practices within the floodplain, karst and lowland areas pose serious risks to aquatic resources.

The Clinch River Ecological Risk

Assessment will help resource managers predict how changes in land use and river flow will affect biological communities in the watershed. This will enable resource managers to make decisions based on more information. This project is co-sponsored by the USEPA's Office of Water and Office of Research and Development as an effort to bring the science of risk assessment into the local community decision-making process.

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