

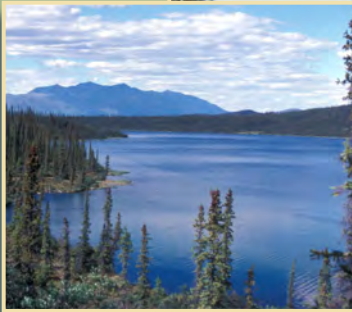


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Identifying and Protecting Healthy Watersheds

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February 2012



Identifying and Protecting Healthy Watersheds

Concepts, Assessments, and Management Approaches

February 2012



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Foreword

Forty years ago, the U.S. Environmental Protection Agency (EPA) was created and tasked with implementing programs designed to repair the damage already done to the environment and to help Americans make their environment cleaner and safer. The objective of the 1972 Clean Water Act amendments was “to restore and maintain the chemical, physical, and biological integrity of the nation’s waters.” Through restoration of impaired water bodies, vast environmental improvements have been seen in the last 40 years. However, the rate at which new waters are being listed for water quality impairments exceeds the pace at which waters are removed from the list. It has become clear that a broader view of aquatic ecosystems is critical if we are to truly protect the chemical, physical, and biological integrity of our waters. As we look forward to the future, EPA remains strongly committed to protecting and preserving our country’s environment. On March 29, 2011, EPA released the Coming Together for Clean Water Strategy as the framework for guiding the Agency’s implementation efforts and actions to meet the 2011-2015 Strategic Plan objectives for protecting and restoring our waters. One of the key areas of the Agency’s strategy is to increase protection of healthy waters, including healthy watersheds. The Healthy Watersheds Initiative was launched to place a renewed emphasis on the protection of our nation’s healthy waters and to leverage these natural resources to accelerate our restoration successes. Through the Healthy Watersheds Initiative, EPA is working with state, tribal, and other partners to take proactive measures to identify and protect healthy watersheds based on integrated assessments of habitat, biotic communities, water chemistry, and watershed processes such as hydrology, fluvial geomorphology, and natural disturbance regimes.

The integrity of aquatic ecosystems is directly affected by their landscape context and the processes that occur in their watershed. Natural land cover maintains hydrologic and sediment regimes within a natural range of variation that shape the aquatic habitat upon which biological communities have evolved and can’t live without. Conversion from natural to anthropogenic land cover typically results in altered flow regimes, changes in sediment supply and transport, increased loading of nutrients and other pollutants, and ultimately leads to degradation of the biological community. Recognizing these connections and the role of watershed processes and functions on water quality, the Healthy Watersheds Initiative augments EPA’s traditional focus on regulating specific pollutants and pollutant sources, emphasizing protection of critical watershed processes that support chemical, physical, and biological integrity. Healthy, functioning watersheds provide the building blocks that anchor water quality restoration efforts. Without this ecological support system, we will have more limited success in restoring impaired waters and will lose the many socio-economic benefits of healthy ecological systems.

This document is a technical resource that provides information for assessing, identifying, and protecting healthy watersheds. It is not program implementation guidance. EPA, state, territory, and authorized tribal decision makers retain the discretion to adopt approaches to identify and protect healthy watersheds that differ from those described in this document. This document can assist in those efforts by providing a wealth of information and examples that we hope will inspire and motivate aquatic resource scientists and managers to conduct integrated healthy watersheds assessments and initiate protection programs that are cognizant of the systems context. Chapter 1 introduces the Healthy Watersheds Initiative, discusses the characteristics of a healthy watershed, and reviews the benefits of protecting healthy watersheds. Chapter 2 describes the healthy watersheds conceptual framework and discusses, in detail, each of the six assessment components – landscape condition, habitat, hydrology, geomorphology, water quality, and biological condition. A sound understanding of these concepts is necessary for the appropriate application of the methods described in later chapters. Chapter 3 summarizes a range of assessment approaches currently being used to assess the health of watersheds, and are provided as examples of different assessment methods that can be used as part of a healthy watersheds integrated assessment. Chapter 4 presents an example screening level method for conducting a healthy watersheds integrated assessment and identifying healthy watersheds, and includes examples of

state assessments that approximate integrated assessments. Chapter 5 summarizes a variety of management approaches for protecting healthy watersheds. Lastly, the appendices contain a summary of assessment tools, sources of data, and a compilation of assessment and management examples cited in the document. Readers can navigate between the chapters depending on their needs and priorities.

The term integrated assessment is used in this document to describe a holistic evaluation of system components and processes that results in a more complete understanding of the aquatic ecosystem, and allows for the targeting of management actions to protect healthy watersheds. The healthy watersheds integrated assessment and management framework, shown below, requires collaboration with multiple partners throughout the entire process. Critical first steps include framing the scale and context of the assessment and ensuring that all relevant data and expertise have been identified and obtained. The data are then used to evaluate each of the six healthy watersheds assessment components - landscape condition, habitat, hydrology, geomorphology, water quality, and biological condition. The results of the individual assessments are synthesized to provide an overall assessment of watershed health. From here, strategic watershed protection priorities can be identified by evaluating vulnerability alongside the identified healthy watersheds. As watershed protection measures are implemented, it will be important to collect new data and information that help to demonstrate the effectiveness of watershed protection activities and that can be used to refine future assessments. The healthy watersheds integrated assessment and management framework is not a linear effort with a defined endpoint. Assessment and management of healthy watersheds is an adaptive and iterative process, with new data and improved methodologies providing refined assessment results and more effective protection strategies over time.

