Technical Report #4

An Ecological Classification Integrating Uplands and Riverine/Riparian Habitats Applied to the Thompson River Basin, Montana

Overview

Effective land management requires an understanding of climate, geology, vegetation patterns, landforms, soils, and streams. Ecological classification provides a framework and descriptive attributes from which interpretations regarding habitats and effects of land uses can be made. The purpose of Technical Report #4 is to describe a classification system developed for the Thompson River Basin. This system can be used as a tool to assess the ecological potential and the existing condition of riparian habitat.

Key Points

The table below identifies the levels of hierarchy used to classify the Thompson River Basin.

Ecoregion	
Geologic District	
Subsection	
Uplands	**Bottom-Lands**
Landtype Association	Valley-Bottom Landtype
Landtype	Valley-Bottom Type
Habitat Type	State
Vegetation Type	Valley Bottom Landform
	Riparian Vegetation Type

Supporting Technical Information

Classification is used to identify areas with similar functions that respond to forest management in predictable ways. More than 70 years ago, scientists began to develop classification systems for landforms. Throughout the years, several classification systems have been adopted, modified, and rejected. The classification system developed in this report is based on work that began in the 1970s and takes advantage of recent thought that integrates upland and riparian habitats. The classification adopted for the Thompson River Basin, shown as a table under *Key Points*, is summarized below.

Ecoregion

Ecoregions are the broadest classification, and can either be relatively similar throughout their range or have great variation. Ecoregions provide a general framework for nesting lower classification levels. The Thompson River Basin is entirely within the *Northern Rockies Ecoregion*.

Geologic District

Geologic districts are areas with distinctive lithology (rock types) or parent material (for example, granite versus metamorphic). Geologic districts correspond with distinctive plant communities (which have a preference for soil types and minerals), specific stream bottom composition (sand

versus gravel), and potentially different water quality. The Thompson River Basin lies within a single *metasedimentary geologic district,* which is typical of the *Northern Rockies Ecoregion*. The potential for slope stability and habitat for certain plant species is similar to those in the Swan River Basin.

Subsection

Subsections are lands that evolved in response to distinctive geomorphic processes that correlate with landscapes of distinctive form—mountains sculpted by alpine glaciers are distinguished from mountains dissected by streams and from more gentle terrain shaped by continental glaciation. In the Thompson River Basin, four subsections were distinguished.

Subsections can be further separated into two basic geomorphic groups: uplands and bottom-lands. Uplands within a subsection, defined by geomorphic parameters, are further stratified at successively larger scales into landtype associations, landtypes, habitat types, and vegetation types. Bottom-lands within a subsection are stratified as valley-bottom types, states, valley-bottom landforms, and riparian vegetation types. Valley-bottom types denote bottom-lands within a subsection with more distinctive ecological potential. States are condition classes based on channel morphology that may change in response to management. Changes in state lead to predictable changes in valley-bottom landforms and riparian vegetation types. The condition of riverine/riparian habitat can be quantified in terms of the distribution of states for a stream reach or a watershed.

Conclusion and Implications

Ecological classification is a tool to organize landscapes into areas with distinctive ecological potential. In the Thompson River Basin, results of the classification are being used to group upland and riverine/riparian habitats, to assess the similarity of watersheds, to screen for landscape hazards, and as a foundation for more intensive watershed and aquatic analyses (See Technical Reports #8 and #11).