ECOLOGICAL CLASSIFICATION
BEAR RIVER BASIN
IDAHO

Prepared for:

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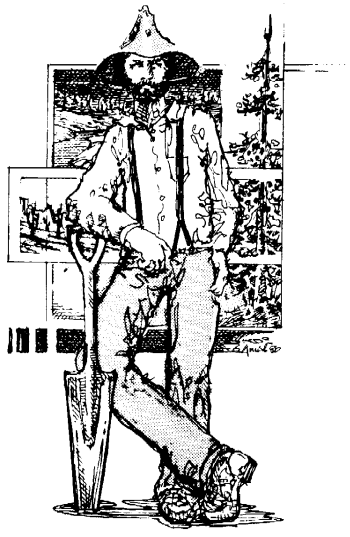

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EXECUTIVE SUMMARY

An ecological classification was applied to the the Bear River basin in Idaho to facilitate preparation of export coefficients. It is expected that export coefficients vary spatially. Export coefficients for unimpacted watersheds are expected to vary in response to differences in climate, geology and geomorphology that are causative of more manifest differences is hydrology, soils and vegetation. Differences in these same parameters are expected to correlate with the degree of impacts for the same management.

The same management will impact different climatic, geologic and geomorphic settings to different degrees, resulting in different export coefficients. Given the anticipated spatial variance in export coefficients, the approach was to stratify the Bear River basin in Idaho into areas with relatively homogenous landscape characteristics thought to influence potential (background) sediment and phosphorous flux. For comparisons of unimpacted (control) and impacted (treatment) watersheds to be valid, they must all be located in watersheds with similar potential.

The project area is about 2,814 square miles (1,801,172 acres) and contains a stream network that is 5,087 linear miles, of which 1,469 miles (29 percent) is perennial.

The ecological classification is hierarchical and consists of four levels, ranging from broad classes based on general landscape characteristics to very refined classes of valley-bottom types. Levels of the hierarchical classification applied in this study are:

Ecoregion
Geologic District
Subsection
Valley-bottom Type

Broad classes (Ecoregion, geologic district and subsection) were applied to the entire project area. Valley-bottom type was applied only to streams order 3 or greater. A state (i.e. condition) class was also considered, but found to be relatively homogeneous for the main-stem Bear River throughout the project area. More refined classes (valley-bottom landform and riparian vegetation type) were not considered.

Ecoregions (Omernik 1987) are based on factors that cause regional variation in ecosystems or on factors that integrate the causes of regional factors. The project area includes parts of the *Northern Basin and Range, Middle Rockies, Wyoming Basin* and *Wasatch and Uinta Mountains Ecoregions*. Bailey (1994) identified two provinces (*Intermountain Semi-Desert* and *Southern Rocky Mountains)* in the project area. The *Intermountain province* includes parts of the *Northwestern Basin and Range* and the *Bear Lake sections.* The *Southern Rocky Mountain province* in the project area is part of the *Over-thrust Mountains section.*

Geologic districts are areas of distinctive rock types or parent materials that are often associated with major structural features. Five (5) geologic districts were identified in the project area: 1) *Metamorphic;* 2) *Sedimentary*; 3) *Sedimentary (calcareous);* 4) *Volcanic*; and 5) *Unconsolidated.*

Subsections are areas with distinctive geomorphic character that often correspond with geologic districts. Seven subsections were identified in the project area: 1)*Metamorphic fluvial lands*; 2) *Sedimentary fluvial lands*; 3) *Sedimentary (calcareous) alpine glacial lands;* 4) *Sedimentary (calcareous) fluvial lands;* 5) *Volcanic fluvial lands*; *6) Unconsolidated alluvial lands; and* 7) *Unconsolidated lacustrine lands.*

The valley-bottom landtype corresponds with the drainage network and includes both alluvial and fluvial deposits. The valley-bottom landtype was delineated for streams order 3 and greater and comprises 168,642 acres (9.4 percent) of the Bear River basin in Idaho.

The valley-bottom landtype within a subsection was further stratified as valley-bottom types. Valley-bottom types were distinguished by the mechanism and relative effectiveness of geomorphic processes in shaping the valley-bottom. For example, the valley-bottom in the *Metamorphic fluvial* subsection was divided into: 1) *fluvial basin*; 2) *V-erosional canyon*; and 3) *V-depositional canyon*. Fifteen (15) valley-bottom types were identified.

We intended to identify states (i.e. condition classes) for the Bear River and some of it's major tributaries. States are identified based on channel morphology. Key attributes for identifying states typically include: 1) channel elevation relative to that of valley-bottom landforms (i.e. graded versus not graded); 3) bank stability and canopy cover; 4) extent of streambars; 5) impoundment; and 6) management factors (i.e. channelization). Following review of aerial photos and field reconnaissance, we concluded that states were not a significant influence on water quality parameters. States were not identified. Valley-bottom landforms and vegetation types were also not identified.

Results are summarized for the watersheds of water quality monitoring stations on tributaries of the Bear River and for the "effective" watersheds of monitoring stations on the Bear River.