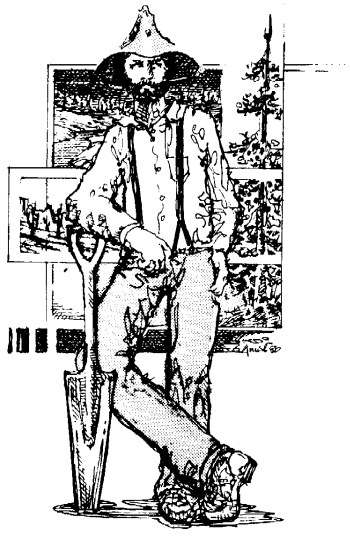
ECOLOGICAL CLASSIFICATION
UPPER SNAKE RIVER BASIN
IDAHO, OREGON, NEVADA
UTAH AND WYOMING

Prepared for:

IDHW, Division of Environmental Quality
Twin Falls, Idaho



WHITEHORSE ASSOCIATES
Smithfield, Utah

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EXECUTIVE SUMMARY

An ecological classification was applied to the upper Snake River basin in southern Idaho to facilitate estimation of sediment and phosphorous export coefficients for grazing related activities. It was expected that export coefficients vary spatially across southern Idaho. 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 livestock management.

The same livestock 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 southern 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 the upper Snake River basins, which is about 73,071 square miles (46,765,471 acres). The focus of the ecological classification was riverine/riparian habitat in seven target watersheds that comprise about 142,363 acres and include about 470 linear miles of stream, of which 179 miles (38 percent) is perennial.

The ecological classification is hierarchical and consists of seven levels, ranging from broad classes based on general landscape characteristics to very refined classes of valley-bottom landform and riparian vegetation types. Levels of the hierarchical classification are:

Ecoregion
Geologic District
Subsection
Valley-bottom Type
State
Valley-bottom Landform
Riparian Vegetation Type

Broad classes (Ecoregion, geologic district and subsection) were applied to the entire project area. Landtype and valley-bottom type were applied only to target watersheds. The most refined classes (state, valley-bottom landform and riparian vegetation type) were applied only to the main course of target streams.

Ecoregions (Omernik 1987) are based on factors that cause regional variation in ecosystems or on factors that integrate the causes of regional factors. The upper Snake River basin includes parts of the *Snake River Basin/High Desert* and the *Northern Basin and Range Ecoregions.*

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) *Volcanic*; 3) *Sedimentary;* 4) *Granitic*; and 5) *Unconsolidated.*

Subsections are areas with distinctive geomorphic character that often correspond with geologic districts. Twelve (12) subsections were identified in the upper Snake River basin: 1)*Metamorphic alpine glacial (erosional) lands*; 2) *Metamorphic fluvial lands; 3) Volcanic alpine glacial (erosional) lands; 4) Volcanic fluvial lands*; 5) *Volcanic plateau lands*; 6) *Sedimentary alpine glacial (erosional) lands; 7) Sedimentary fluvial lands; 8) Sedimentary alpine glacial (depositional) lands; 9) Granitic alpine glacial (erosional) lands;* 10) *Granitic fluvial lands; 11) Granitic alpine glacial (depositional) lands;* and 12) *Mixed alluvial lands.*

The valley-bottom landtype corresponds with the drainage network and includes both alluvial and fluvial deposits. The valley-bottom landtype was delineated for the watersheds of target streams. The *valley-bottom landtype* is about 11,043 acres (7.7 percent) of target watersheds.

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 *Sedimentary fluvial* subsection was divided into: 1) *Sedimentary fluvial basin*; 2) *Sedimentary V-erosional canyon*; and 3) *Sedimentary V-depositional canyon*. Twenty one (21) valley-bottom types were identified in target watersheds.

Target streams included: 1)Dry Creek (East and West Forks); 2) Fifth Fork Rock Creek; 3) Birch Creek (north); 4) Birch Creek (south); 5) Trout Creek; 6) Jay Creek; and 7) Trapper Creek.

Valley-bottom types for the main course of target streams were further divided into states (i.e. condition classes). States were identified based on channel morphology and ranged from near natural to severely disturbed. Key attributes for identifying states included: 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).

Valley-bottom landforms were mapped for target stream reaches. Landforms included: *channel, levee, floodplain, terrace, alluvial fan* and *lake/reservoir basin.* Soils tend to correlate with landform and valley-bottom type/state. Where streambanks cut "higher and dryer" landforms, such as terrace and alluvial fan, they are inherently less stable than where streambanks are cut in "lower and wetter" landforms, such as levee and floodplain. Detailed maps of valley-bottom landforms were prepared from aerial photos.

Vegetation types were mapped for the valley-bottom of target stream reaches from the same aerial photos. Seventeen (17) vegetation and miscellaneous types were identified. Community physiognomy (e.g. trees, shrub, herbaceous) and apparent water regime (e.g. seasonally flooded) were key factors used to identify vegetation types that generally correlate with valley-bottom type, state and valley-bottom landform. The distribution of vegetation types reflects the existing condition of riverine/riparian habitat.

Two condition ratings were calculated. A riparian condition rating was calculated from the distribution of states, weighted by areas of the valley-bottom. A stream condition rating was calculated from the distribution of states, weighted by lengths of stream . Condition ratings range from 0 (worst) to 100 (best). Classes for condition ratings are:

< 25 Very Poor
25-50 Poor
50 - 75 Fair
>75 Good

The riparian condition rating for target streams varied from 21 (very poor) to 76 (good). The stream condition rating for target streams ranged from 35 (poor) to 72 (fair).