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REPORT ON THE RIPARIAN PLANT ASSOCIATION GROUPS
AND ASSOCIATED VALLEY BOTTOM TYPES
OF THE COLUMBIA RIVER BASIN'

Mary E. Manning and Lisa D. Engelking

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I. INTRODUCTION

I.A. PURPOSE

On June 4, 1992, the USDA Forest Service adopted a policy of ecosystem management for the National Forest System lands. This policy seeks to sustain the patterns and processes of ecosystems, while providing immediate goods and services to the public. **Zonneveld (1988)** suggests that to achieve optimal land-use planning, the evaluation of ecosystems and landscapes should consider a synthesis of sociological, ecological, technological, and economic factors. Determining peoples' desires and requirements in relation to renewable and nonrenewable resource products of the ecosystem balanced with the desired condition of the ecosystem encompasses the sociological factors. Understanding **ecosystem** function, composition, structure and natural range of variation becomes the ecological factors. Determining whether the sustainable vision of the landscape is achievable through funds and available technology defines the economic and technological factors.

To implement planning and analysis objectives, ECOMAP, the Ecological Classification and Mapping Task Team, designed the National Hierarchical Framework of Ecological Units, a multi-scaled land classification system which provides a consistent approach to ecosystem classification and mapping at multiple geographic scales. The framework is "...a regionalization, classification, and mapping system for stratifying the Earth into progressively smaller areas of increasingly uniform ecological potentials. Ecological types are classified and ecological units are mapped based on associations of those biotic and environmental factors that directly affect or indirectly express energy, moisture, and nutrient gradients which regulate the structure and function of ecosystems. These factors include climate, physiography, water, soils, air, hydrology, and potential natural communities." (ECOMAP 1993)

The purpose of this report is to 1) provide land managers with a description of valley segment environments in the Interior Columbia Basin (ICB) area, 2) describe dominant and codominant riparian plant association groups (PAG) within these environments, and 3) to associate these environments to map themes within the context of the National Hierarchical Framework of Ecological Units.

I.B. STUDY AREA DESCRIPTION

I.B.1. PROVINCES AND SECTIONS

The Interior Columbia Basin (ICB) study area consists of the eastern portions of Oregon and Washington, Idaho, western Montana and Wyoming, and northern portions of Utah, Nevada, and California.

This report has been integrated into the four highest levels of the National Hierarchical Framework of Ecological Units. At the global scale, the UCRB is located within two domains, the coarsest and largest level of The National Hierarchical Framework of Ecological Units, 1) the Dry **Domain**- stretching across the western United States to the Cascade Mountain Range in the north and the Sierra Nevada Mountains to the south, and 2) the Humid Temperate **Domain** - extending from the Cascade Mountains and the Sierra Nevadas west to the Pacific Ocean.

At the continental scale, which is represented by the Division unit of the framework, the ICB is contained within four divisions: 1) the Marine Division along the Cascade Mountain Range in Washington and Oregon, 2) the Mediterranean Division, covering California east to the Sierra Nevada, 3) the Temperate Steppe Division, covering the northern, east-central, and southeastern portions of the ICB, and 4) the Temperate Desert Division which comprises the western central and southwestern portion of the ICB.

The next level down in the National Hierarchical Framework of Ecological Units is the Province level, equivalent to a regional scale; within the Provinces are the next lowest level, the Section, ten to thousands of square miles in size. The following are the eight Provinces' contained within the ICB, as well as brief descriptions of the included twenty-three Sections summarized from **McNab** (1994). These descriptions consist of common upland series - diagnostic species found in the uppermost strata of the vegetation, and environmental factors, processes and disturbances which affect vegetation patterns within the section, as well as some surface water characteristics.

Cascade Mixed Forest - Coniferous Forest - Alpine Meadow Province

Section **M242C-Eastern Cascades** - The elevation ranges from near sea level by the Columbia River to more than 10,000 feet in the mountains. The climate is mild with temperature averages ranging from 30 to 52 degrees F and annual precipitation ranging from 20 to 120 in. Stream water quality is very high. Many streams exhibit large differences between peak and low flows. Localized wetlands are scattered and there are numerous manmade reservoirs at lower elevations. Volcanic activity and effects of glaciation are processes shaping the topography in this section. Many volcanoes are still active, with an eruption occurring about every 25 years. There are recent volcanic vents on the flanks of larger volcanoes. There are areas of fresh lava flows, particularly on the eastern slopes.

Upland vegetation is highly varied. White Fir, Grand Fir, Silver Fir, Douglas Fir, Hemlock and Subalpine Fir forests are all common. Alpine meadows and barrens occur at higher elevations; Ponderosa Pine and **Lodgepole** Pine forests dominate the lower elevations. Quaking Aspen, spruce, grass and sedge meadows also occur. There are large areas of this section within national forest and other

Federal and State boundaries where the vegetation has been influenced by intensive forestry and use for municipal supply watersheds. Some areas left as wilderness have been fairly unaffected. Valley bottom vegetation has been altered by livestock grazing, agriculture, and travel corridors. Fires, insect epidemics, and root rot are common and influence plant community health and distribution.

Sierran Steppe - Mixed Forest - Coniferous Forest - Alpine Meadow Province

Section **M261D-Southern** Cascades This mountainous section ranges from 1500 to 14,000 feet in elevation. Temperatures average 42 to 58 degrees F. The area receives 20 to 50 in. annual precipitation. Slow to moderately rapid rivers and streams are abundant.

Upland vegetation includes White Fir, Ponderosa Pine, mixed conifer, Red Fir, **Logpole** Pine, Oregon Oak, and sagebrush communities. Composition and successional sequence of plant communities has been influenced and altered by mining, grazing, forestry, and recreational activities. At lower to mid-elevations, fire disturbances are infrequent, high intensity, stand-replacing fires. At higher elevations, fires are infrequent low, moderate, and high intensity surface or stand-replacing fires. The vegetation and fire disturbance regime are strongly influenced by wide fluctuations in precipitation and temperature for periods of years. There is also some recent (within the last 200 years) volcanic activity here.

Section **M261G-Modoc** Plateau This section ranges in elevation from 3000 to 9,900 feet with 12 to 30 in. of annual precipitation, and temperature averages of 45 to 52 degrees F. Mountain ranges have a northwesterly alignment, with intervening **lakebed** basins and cinder cones. There are very few perennial streams; most are ephemeral and do not flow in the summer. There are numerous small to large lakes and reservoirs.

Upland vegetation includes Ponderosa **Pine**, **mixed** conifer, Western Juniper, White Fir, Big Sagebrush, and Carex communities. Agricultural use and fire suppression influence the vegetation patterns. Historically, fires were frequent, low intensity ground fires. They are now infrequent, high intensity stand-replacing fires.

Great Plains-Palouse Dry Steppe Province

Section **331-Palouse** Prairie Comprised mainly of loess-covered basalt plains and hills, this section ranges from 1200 to 6000 feet in elevation. Annual precipitation is between 10 to 30 in. with average temperatures of 45 to 54 degrees F. Stream densities are low to moderate with scattered coulees and deeply-incised major drainages.

This section consists of grasslands and meadow-steppe vegetation such as Bluebunch Wheatgrass, Idaho Fescue and snowberry where precipitation is higher. Ponderosa Pine woodlands and forests occur on hills and low mountains in the eastern part of the section, with Douglas-Fir dominating higher elevations and isolated Western Red Cedar and Grand Fir communities on sheltered north slopes. Major influences on vegetation are agriculture and grazing. Wind is the main source of natural disturbance.

Southern Rocky Mountain Steppe - Open Woodland - Coniferous Forest
- Alpine Meadow Province

Section **M331A-Yellowstone** Highlands Elevations range from 2500 to 13,000 feet in this diverse section of glaciated volcanic mountains, plateaus, basins and valleys. Precipitation ranges from 20 to 45 in. annually, falling mainly during fall, winter, and spring. Above 6000 feet, most precipitation occurs as snow. Temperature averages 35 to 47 degrees F. This section has many perennial streams and lakes. Numerous lakes and wetlands occur above 6000 feet. Hot springs are common.

Lower valleys are often wheatgrass-needlegrass grassland/with Douglas-Fir, Western Spruce, and Lodgepole Pine forests at higher elevations. The alpine zone includes Whitebark Pine, Subalpine Fir, Sheep Fescue, Alpine Bluegrass, and American Bistort. Fire, insect infestations, and disease affect vegetation patterns; as well as land use such as agriculture, recreation, timber production, and livestock grazing.

Section **M331D-Overthrust** Mountains This section includes several north-south oriented mountain ranges such as the Tetons, Salt River, Snake River, Bear River, and Caribou ranges, which exert a strong influence on the climate. Elevation extends from 5000 to 13,000 feet. Precipitation occurs mostly during fall, winter, and spring, ranging from 16 to 40 in. annually, and occurs mostly as snow above 6000 feet. Temperatures average 35 to 45 degrees F. There are few perennial streams in this section. Most lakes and wet meadows occur below 5000 feet.

Lodepole Pine, Subalpine Fir, Douglas Fir, and sagebrush dominate the section. Vegetation zonation is controlled by altitude, latitude, slope aspect, and prevailing winds. Active processes on the vegetation include fire, mass movement, and water erosion. Timber production, grazing, mining, oil and gas extraction, and recreation all affect the plant communities found in this section.

Section **M331J-Wind** River Mountains Elevations range from 6000 to 13,000 feet in this mountainous section. Annual precipitation, which increases with elevation, ranges from 15 to 100 in. and temperature averages 34 to 47 degrees F. Lakes and wet meadows are common above 8000 feet, and perennial streams and glacial lakes are common.

Lodgepole Pine and alpine grasses and herbs are characteristic of this section. Spruce-fir and Douglas Fir forests are also present. Soil erosion, livestock grazing, and to a lesser degree, timber production affect the vegetation.

Middle Rocky Mountain Steppe - Coniferous Forest - Alpine Meadow Province

Section **M332A-Idaho** Batholith The elevation ranges from 3000 to 10,000 feet. Glaciated mountains with alpine ridges, cirque basins, and steep breaklands are dominant features. It receives between 20 and 80 in. of annual precipitation, mostly during the fall, winter, and spring as snow. Temperatures average 35 to 46 degrees F. The section has many perennial streams and lakes, including the Salmon and Payette Rivers, and **Redfish** Lake, Warm Lake, and Payette Lake. The river breaklands have very steep straight tributaries.

Grand Fir, Douglas Fir, Western Spruce, and Ponderosa Pine forest communities dominate this section. Fire, insects, and disease alter vegetation patterns. Land use such as timber harvesting also affect the plant communities.

Section **M332B-Bitterroot** Valley The section is characterized by high, glaciated mountains, with alpine cirques and ridges, and steep slopes, lacustrine basins, and narrow valleys. Elevations range from 2500 to 10,000 feet. Annual precipitation is between 14 to over 80 in., mostly falling in the fall, winter, and spring as snow. Average temperature is 36 to 46 degrees F. There are many perennial streams and rivers in this section, including the Bitterroot and the Clark Fork Rivers.

Western Larch, Douglas Fir, Subalpine, and Ponderosa Pine forests are dominant, along with Bluebunch Wheatgrass, Idaho Fescue, and Rough Fescue grasslands. Large, high-intensity fires expected in this area due to fire suppression, will heavily impact the vegetation, as well as periodic insects and disease outbreaks. Timber harvest and livestock grazing also impact the vegetation.

Section **M332C-Rocky** Mountain Front Elevation ranges from 5500 to 8500 feet. Glaciated mountains with limestone **scarps** and ridges are the dominant features. Annual precipitation ranges from 18 to over 100 in. mostly falling from spring to early summer, with temperature averages of 36 to 45 degrees F. Large fluctuations of winter temperatures and severe chinook winds are common. The area has many dendritic perennial streams and some lakes, with smaller lakes occurring in the high elevation cirque basins.

At lower elevations, foothill prairie plant communities with wheatgrasses, fescues, and needlegrass are common. Douglas-Fir, Western Spruce, Limber Pine, and Aspen are abundant at higher elevations. Major disturbance factors include windthrow, (due to the strong chinook winds), fire, insects, and disease. Livestock grazing is probably the most influential **land use** affecting the

vegetation patterns.

Section **M332D-Belt** Mountains This section includes isolated high mountain ranges, with gravel-capped benches and intermontane valleys, and rolling hills and plains ranging from 2500 to 8500 feet in elevation. The cold, continental climate exhibits strong winds; annual precipitation is from 10 to 40 in., mostly occurring in the spring and early fall. Temperatures average 36 to 45 degrees F, with extreme winter temperature fluctuations. The section has widely-spaced perennial streams.

Foothill grasslands of wheatgrasses, fescues, **grama**, and needlegrass are dominant plant communities. The mountains are dominated by Douglas-Fir, Ponderosa Pine, Limber Pine, and Subalpine Fir forests. Fire, disease, and insects, and land use such as livestock grazing and timber harvest influence the vegetation.

Section **M332E-Beaverhead** Mountains Elevations range from 2500 to **10,000** feet in a complex of mountainous landforms. Annual precipitation ranges from 10 to 50 in., mostly as snow. Temperature averages 36 to 46 degrees F. The continental climate is cold and dry. Intermittent streams are common, reflecting the dry nature of the section. Lakes occur at higher elevations in glaciated areas.

The vegetation is mostly sagebrush steppe with Big Sagebrush, fescues, wheatgrasses, and needlegrass. Patches of alpine vegetation occur at higher elevations, and forests with **Douglas-Fir**, Limber Pine, and Lodgepole Pine are common. Fire and insects impact the plant communities, along with livestock grazing.

Section **M332F-Challis Volcanics** Section This section is composed of mountains and valleys spanning 4000 to 11,800 feet. Precipitation is 10 to 45 in. annually. Temperatures average 34 to 50 degrees F. There is large rain shadow effect reducing precipitation to the west due to high mountain barriers. The **climate is** influenced by the prevailing westerly winds and the north-south orientation of the mountain ranges. The section has many perennial streams.

Western Spruce-fir forests and Big Sagebrush steppe codominate the upland vegetation of this section, with Whitebark Pine and Subalpine Fir occurring at the highest elevations. Major disturbances on the vegetation are caused by high intensity fires started by lightning during summer thunderstorms, and by water erosion. This section is affected by timber production and livestock grazing. Mining and recreational usage is also influential on the vegetation.

Section **M332G-Blue** Mountains Elevations range between 1000 and 10,000 among mountains, mesas and buttes, wide valleys, and lava plains. The valleys receive relatively low annual precipitation between 9 to 18 in., while the higher elevations receive 17 to 100 in. Temperature averages from 28 to 52 degrees **F**. The section has

few perennial streams, but there are numerous scattered springs, and alpine lakes in higher elevations.

Grand Fir and Lodgepole Pine forests are dominate and occur on deep volcanic souls at mid-elevations. Ponderosa Pine forests are common at low elevations. Shrublands with Western Juniper, Mountain Mahogany, Bitterbrush, Common Snowberry, and Low Sage are interspersed. At higher elevations, Subalpine Fir and alpine meadows and barrens occur. Grasslands are found at the high elevations with Green and Idaho Fescues and sedges, and at low elevations with Idaho Fescue, Sandbergs Bluegrass, and Prairie Junegrass. Wet meadows occur with sedges and Tufted Hairgrass. Fire, insects, and floods impact the vegetation, as do usages such as mining, agriculture, and grazing.

Northern Rocky Mountain Forest - Steppe - Coniferous Forest -
Alpine Meadow Province

Section **M333A-Okanogan** Highlands Characterized by glaciated mountains with moraines and valleys, both narrow and broad, this section ranges from 1376 to 7309 feet in elevation. Annual precipitation, mostly snow, is 30 to 80 in. Temperature averages 30 to 58 degrees F. There is a moderate density of streams and lakes. There are some glacial lakes and wet meadows associated with the last retreat of the glaciers.

The vegetation differs significantly along an east-west gradient of the section. Vegetation of the western third is dominated by Big Sagebrush communities at lower elevations, and Ponderosa Pine and Douglas-Fir at mid elevations, and Subalpine Fir at the highest elevations. The eastern two-thirds of the section is characterized by Douglas Fir forests at lower elevations, Grand Fir, Western Hemlock, Western Red Cedar, and Subalpine Fir at increasing elevations. Fire, livestock grazing, and forestry affect the vegetation patterns.

Section **M333B-Flathead** Valley This section stretches from 2000 to 7000 feet in elevation and consists of glaciated mountains with moraines. Climate is cool temperate, and some maritime influence, with 18 to over 100 in. in annual precipitation, mostly as fall, winter, and spring snow, and temperature averages of 36 to 45 degrees F. The area has many streams, lakes, bogs and wetlands.

Vegetation is dominated by Douglas-Fir and Western Ponderosa Pine forest with hemlock, cedar, and Grand Fir common. The principal natural disturbances to vegetation are fire, insects, and disease. Livestock grazing and forestry practices also affect vegetation patterns.

Section **M333C-Northern** Rockies Characterized by steep glaciated overthrust mountains, this section ranges from 3000 to 9500 feet in elevation. Annual precipitation ranges from 16 to over 100 in., falling mainly as snow during the fall, winter, and spring. The temperature averages 36 to 46 degrees F, and the climate is cool temperate with a little maritime influence. The section has

abundant perennial streams and lakes.

Douglas Fir forest is prevalent, as well as foothills prairie with wheatgrasses, fescues, and needlegrass. Hemlock, cedar, and grand fir communities also occur. Impacts on the vegetation are from fire, insects, disease, and forestry practices.

Section **M333D-Bitterroot** Mountains Elevation ranges from **1200** to 7000 feet and is composed of steep dissected mountains and narrow valleys. Annual precipitation ranges from 40 to 80 in., mostly in the fall, winter, and spring months as snow. Average temperatures are 36 to 45 degrees F. The climate is cool, moist temperate, maritime-influenced with relatively dry summers. Incised perennial streams are common.

Western Red Cedar, Western Hemlock, Western White Pine, Douglas Fir, and Ponderosa Pine communities are prevalent. Mountain Hemlock and Grand Fir forests are common. Mass wasting, fire, insects, and disease are principal disturbances to the vegetation in this section. Forestry and recreation are land usages which also impact the vegetation patterns.

Intermountain Semi-Desert and Desert Province

Section **341E-Lahontan** Basin Section This section ranges from 4000 to 9800 feet in elevation, and is comprised of upthrust **north-south** trending mountains which are **interspersed with** interior **playas**. Annual precipitation is relatively low at 4 to 12 in., falling mostly in the spring in the north, and during the winter in the south. The climate is hot and dry in the summer, and cold and dry in the winter with temperature averages of 44 to 52 degrees F. There are a few perennial lakes, marshes, and streams in the interior basins. Most streams are ephemeral or intermittent.

Upland vegetation consists of Great Basin Sagebrush, **Pinyon-juniper**, and Aspen communities. Greasewood and **saltbush** also occur. Fires from thunderstorms, flooding, water and wind erosion are all active in affecting the vegetation of this section. Livestock grazing is the primary land use affecting the vegetation.

Intermountain Semi-Desert Province

Section **342B-Northwestern** Basin and Range This section is composed of desert plain with isolated mountains ranging from 4000 to 7200 feet in elevation. Annual precipitation ranges from 4 to 20 in. and is evenly distributed throughout the fall, winter, and spring. Temperature averages range between 41 to 50 degrees F. There are few rivers and streams, and water is scarce except at higher elevations.

Big Sagebrush, Low Sagebrush, and Shadscale communities dominate the section. Natural disturbances include short duration and low intensity brush fires, from summer thunderstorms, and water and wind erosion. Livestock grazing is the major land use affecting

the vegetation.

Section **342C-Owyhee** Uplands Elevation ranges from 4000 to 8000 feet in this section characterized by mountains, and intermontane plateau. Annual precipitation is between 7 to 15 in. fairly evenly distributed throughout the year, though lower from late summer to early autumn. Temperature averages are 35 to 45 degrees F. There are few streams, rivers, or lakes. Snow at higher elevations contributes to streamflow.

The vegetation is dominated by Sagebrush steppe communities with Artemisia and Agropyron. Fire, water and wind erosion all shape the vegetation patterns, along with livestock grazing and agriculture such as irrigated farming.

Section **342D-Snake** River Basalts This section is composed mostly of basalt plains, with plateau, mountains, shield volcanoes, cinder cones, and lava ridges. The elevation ranges from 3000 to 6000 feet. Annual precipitation is between 5 to 12 in., low in the summer, with temperature averages of 40 to 58 degrees F. There are few perennial streams or lakes.

The vegetation is dominated by Sagebrush steppe communities with Artemisia and Agropyron. Fire, water and wind erosion are natural disturbances to the plant communities. Livestock grazing, agriculture, and nuclear testing are land usages which also impact the vegetation.

Section **342H-High** Lava Plains This section consists of plains with low hills and canyons between 2000 and 5000 feet elevation. Annual precipitation ranges from 7 to 14 in. with average temperatures of 40 to 57 degrees F. Streams are infrequent and mostly intermittent. There are occasional wet meadows, springs, and seeps.

The western edge of the section is **dominated** by Savannah with Ponderosa Pine. Western Juniper, sagebrush, and bitterbrush woodlands are common in the western portion of the section, and sagebrush, wheatgrass-bluegrass communities are dominant towards the east. Sedges, rushes, and forbs occupy wet sites in meadows and along streams. Fire and grazing impact the vegetation of this section.

Section **342I-Columbia** Basin This basalt lava plateau has an elevational range between 200 and 4500 feet. Annual precipitation averages 7 to 18 in., with dry months between August and November. Average temperature ranges between 40 to 57 degrees F. There are a few rivers, streams, and wetlands in this section.

Wheatgrass-bluegrass, and fescue-wheatgrass communities dominate the vegetation of this section. Wind is the main natural disturbance. Agriculture and the introduction of animal species into the valleys have influenced the vegetation patterns.

I.B.2.. RIPARIAN

The focus of the report is on the riparian environments which occur within the mapping units described above. Map scales which are appropriate for depicting upland vegetation are typically too coarse for displaying riparian ecosystems, unless they occupy large river valleys. Riparian area, if mapped at all, are usually described as inclusions (Leonard et al., 1992). Riparian ecosystems are defined as "a transition between the aquatic ecosystem and the adjacent terrestrial ecosystem; identified by soil characteristics or distinctive vegetation communities that require free or unbound water (FSM 2526.04~). They typically include both streambank and floodplain vegetation. Some definitions broaden the concept to include any vegetation outside the active (i.e., 1-2 year recurrence interval) floodplain. **Fluvial** surfaces within the valley bottom that are less frequently inundated, such as benches and low terraces, may be occupied by riparian vegetation that reflects drier soil moisture regimes (i.e., **meso-** or xeroriparian vegetation) (reference?).

This report includes intermittent, ephemeral streams, and **playa** lakes as riparian ecosystems, since the **ICB** encompasses several arid sections which have few perennial streams.

Riparian ecosystems serve a number of important functions. Riparian habitats are important as refuges, for both plant and animal species, especially during periods of environmental stress, such as droughts or rapid shifts in long-term climate patterns. Streamside vegetation provides energy and nutrients to **instream** communities, as well as shading. The removal of riparian vegetation can increase **water** temperature and alter the amount of dissolved oxygen, and numbers of invertebrates and salmonids (Minshall, 1993). Riparian vegetation filters sediment and pollutants (e.g., nutrients) from the water, adds roughness or resistance to high flows, and stabilizes streambanks.

The delineation of riparian environments and the associated vegetation is a difficult task. The riparian environment is the principal interface between the terrestrial uplands and streams. The interface may be an edge, sharp boundary, or an ecotone, a gradual transition between the two, depending on the sharpness of the environmental gradients including climate, topography, landform, and geology. "Although often visualized as ribbons of continuity, riparian ecosystems frequently are encountered as heterogeneous, nonuniform patches and clusters or as isolated islands, especially in **areas** of intensive land **use** or in more arid regions" (Minshall, 1994).

In addition to the environmental factors which also affect upland vegetation (e.g., geology, soil type and depth, solar radiation, precipitation, temperature), riparian vegetation is also affected by other **abiotic** factors specific to riparian ecosystems, including proximity to the water and extent, frequency, and duration of flooding. Such factors cause riparian vegetation to exhibit a high degree of structural and compositional diversity,

and dynamic change.

I.C. GENERAL DESCRIPTION OF APPROACH

The structure and composition of plant communities change over time. This biotic process is termed "succession". Succession is a function of the close relationship of both the species within the community (autogenic) and the environmental variables and the plant community (**allogenic**). The changes in plant composition may accompany adjustments to environmental factors such as soil chemistry and moisture, understory solar radiation, etc. The plant community changes toward a steady state which is termed the climax, or "potential natural plant community, and/or potential natural vegetation".

Most riparian areas, however, undergo a great deal of change compared to uplands (Leonard et al., 1992). They typically do not follow the linear pathway to a stable endpoint, but instead succession is non-linear, cyclical, and typically event-driven. Succession in riparian vegetation **spans** a broad range of temporal scales from a few days or weeks to many years. Many riparian sites can undergo sudden and/or extreme physical changes caused by associated stream dynamics and water availability, soil deposition, and soil erosion. Sometimes, these changes may result in a different potential natural plant community since a different successional pathway was used as a result of the **abiotic** or non-vegetative (e.g., beavers) factors (Leonard et al., 1992).

In addition to the succession of riparian plant communities due to changes in the physical environment, disturbance events can occur which may alter the successional pathway of communities and also the potential natural vegetation of the site. Fires, floods, mud slides, windthrow, insect and disease outbreaks are all examples of disturbances acting upon the vegetation and the environment. After disturbance, recovery time of the vegetation is related to the spatial scale and intensity of the disturbance. Distinct seasonal differences in the ability of stream communities to respond to disturbance also exist (Minshall, 1994). Major **human-**induced disturbances include livestock grazing, forestry and logging practices, mining, beaver introduction and removal, urban (e.g., domestic use, sewage discharge, agricultural practices) use (Minshall, 1994). Disturbances become important when they impact substantial portions of the landscape or when cumulative effects on fine-scale areas across space or time are apparent. Determining potential riparian vegetation is difficult due to the scarcity of unaltered vegetation (by Euroamerican humans) in most riparian areas (Leonard et al., 1992).

The ability to identify and describe plant species presence and abundance patterns from one site to another is the basis for plant community classification. The combination of plant species is a consequence of environmental gradients, such as elevation, temperature, moisture on the landscape; the frequency of species

combinations is also a function of these gradients. "The vegetation component of the ecosystem is thus characterized by the link between distribution patterns of individual plant species, their occurrence in landscape features, and the distribution of the landscape features" (Bourgeron et al., 1994).

Vegetation classifications fall into six major categories. Three of these categories are based solely on attributes of the vegetation: 1) physiognomy, 2) structure, and 3) floristics. The other three categories are integrated classifications which include any of the above vegetation attributes, as well as attributes of the environment, ecological processes, and landscape patterns (Zonneveld, 1988).

Mapping is the delineation of the landscape into discrete units. Any number of different variables, or combinations of variables can be used as the delineating factors. In ecological map unit design, common criteria include climate, landform, geology, and potential plant communities. Assessing the health of an ecosystem for land use planning requires two kinds of maps, 1) those which delineate areas with similar potential for management based on fairly permanent landscape components, such as climate, soil, and geology, and 2) maps that delineate the existing status of ecosystem components that are readily influenced by management practices, or that display high temporal variability, such as existing vegetation (Bailey et al., 1994).

The approach of this riparian project involves a combination of classification, the recognition of the riparian vegetation patterns, and mapping, and attributing these defined vegetation patterns to mapped environments from the National Hierarchical Framework of Ecological Units (**ECOMAP**) within the boundaries of the ICB.

I.D. HOW PRODUCT IS USED

The riparian plant association group (PAG) classification will be used to identify potential riparian ecosystems (those that reflect the probable plant community under optimal conditions given no unnatural disturbances, i.e. "late **seral**" communities) for riparian **PAG's** across the ICB, especially those whose floristics indicate minimal human disturbance.

It will develop a template for assessing and connecting ecological processes with vegetation patterns and management strategies.

II. CLASSIFICATION

II.A. PURPOSE

Classification groups like entities and facilitates communication. Ecosystems include vegetation patterns, environmental factors or constraints, disturbances, and biotic processes which are

hierarchical and can be resolved over a range of temporal and spatial scales. Vegetation patterns can be defined from an individual plant at the finest scale, to plant communities at the regional scale, to biomes at the global scale. Slope and aspect are finer scale environmental constraints compared to glacial cycles and climate fluctuations. Natural disturbances such as mud slides can be local, while floods and regional storms can be viewed from a regional scale. Biotic processes may range from individual tree replacement to coarser scale species migration processes. It is important in ecosystem evaluation and analysis to recognize the scale of the components at which the study needs to take place.

There is no such thing as a "proper" or "correct" scale at which to define vegetation patterns. The proper scale depends on the purpose of the study and must be matched to the scale of the project. For this riparian project we needed a vegetation classification which would allow us to plan at the regional scale or level, while still providing a larger, continental or global context, as well as local ties to **plots** on the landscape. This means that the project required a classification which was organized within a hierarchical framework, and which also allowed us to focus at the regional scale, or plant community/plant association level. Plant communities, or plant associations, are **repeating patterns** of plant species occurring together in similar landscape environments.

The Preliminary Vegetation Classification of the Western United States, jointly compiled by The Nature Conservancy and the Association of Natural Heritage Programs was used (Bourgeron and Engelking, 1993) to identify riparian plant communities, or associations, within the ICB. This classification includes a hierarchy with six levels. The four highest levels are physiognomic (CLASS, SUBCLASS, GROUP, and FORMATION); the two lowest levels are floristic (ALLIANCE, PLANT ASSOCIATION). The physiognomic portion of the classification is based on the UNESCO world physiognomic classification of vegetation (UNESCO, 1973).

In the United States, the habitat type concept developed by Daubenmire (1952) has restricted the use of plant association to climax or late seral vegetation. For the purposes of this document, "**plant association**" is used as defined by the Third International Botanical Congress (1910) : "**a plant community of definite floristic composition, presenting a uniform physiognomy, and growing in uniform habitat conditions**" (Third International Botanical Congress, 1910). In this sense, the plant association concept applies to existing vegetation, regardless of successional status.

II.B. METHODS

II.B.1. BACKGROUND INFORMATION

The riparian plant association group (PAG) workshop built upon earlier work done for the ICB upland vegetation map; some background on this work is necessary in order to fully understand how the riparian **PAGs** were developed.

A series of workshops were held during the summer and fall of 1994 to determine what upland plant associations occur in each section (ECOMAP) in the ICB. Using data from the Preliminary Vegetation Classification of the Western United States (Bourgeron and Engelking, 1993), the plant associations occurring in each ICB section (ECOMAP) were identified. An upland potential vegetation type (PVT) map was developed. These associations were grouped into three lifeform classes: 1) Forests (includes both true forests and woodlands), 2) Shrublands, and (3) Herblands (includes both grasslands and herblands). Studies have demonstrated the distribution of vegetation along major ecological gradients (Whittaker and Niering, 1965). Therefore, each chosen plant association was further stratified along a moisture and temperature gradient within each of the three vegetation classes and for each section of the ICB.

Both temperature and moisture were divided into four classes. The combination of these two variables created a sixteen cell matrix into which each plant association occurring in a section was assigned (Figure 1). The upland plant associations were further assigned to elevation, aspect, and slope classes.

Figure 1. Upland Regional Classes

(To be developed)

Each temperature/moisture class was assigned a numerical code as follows:

TEMPERATURE	MOISTURE
1 = Cold	1 = Wet
2 = Cool	2 = Moist
3 = Warm	3 = Dry
4 = Hot	4 = Very Dry

Temperature is always listed first followed by a comma and the moisture class code (e.g., 1,2 = cold, moist).

The temperature/moisture matrix is a non-numeric, relative measure (or ranking) of the gradients for the plant associations included in each section. For example, the forest vegetation which reflects a hot, very dry (4,4) environment within the Blue Mountain Section of the ICB, e.g., *Pinus ponderosa*/*Pseudoroegneria spicata*, is quite different from the hot, very dry (4,4) vegetation of the Lahontan Valley Section, e.g., *Juniperus osteosperma*/*Artemisia nova*.

To make the plant association groupings more equivalent in terms of their physical environment, they were combined to form a 48 **celltype** regional scale matrix of upland temperature/moisture classes for the Forests, Shrublands, and Herblands across the entire ICB.

II.B.2. Riparian Workshop Methods

The purpose of the riparian workshop was to describe riparian potential vegetation environments in the ICB and to associate these environments to map themes as attribute data. They would not be mapped since they are typically too small to map at the upland PVT map scale (1 km resolution).

Workshop participants included Natural Heritage Program ecologists from Montana, Idaho, Oregon, and Washington, and Forest Service riparian ecologists from Regions 1, 4, and 6. The riparian workshop team began their work with a list of riparian plant associations which were a subset of those documented in the **above-**described upland vegetation PVT workshops. Additional riparian plant associations were added to this list during the workshop from the expert riparian knowledge of the participants.

The plant associations were then assigned membership into plant association groups (**PAG**) using three criteria: 1) upland temperature/moisture class membership (generated during the upland workshops, 2) physiognomy, and 3) riparian moisture phase.

The riparian plant associations retained their membership in the temperature/moisture regional PVT classes as a linkage with their respective upland environment. For the PAG classification, within each of the three vegetation classes; 1) forests, 2) shrublands, and 3) herblands, four temperature/moisture classes could be collapsed into zones, resulting in the following 4 zones:

ZONE 1 - Includes regional classes 1,1 1,2 2,1 2,2 = 1
ZONE 2 - Includes regional classes 1,3 1,4 2,3 2,4 = 2
ZONE 3 - Includes regional classes 3,1 3,2 4,1 4,2 = 3
ZONE 4 - Includes regional classes 3,3 3,4 4,3 4,4 = 4

Because the set of riparian plant associations is a subset of those generated during the upland PVT workshops, most of the riparian plant associations fell into Zone 1 as cold and wet, or Zone 3 as warm and wet. The exception were ten plant associations which occur in Zone 4 as warm and dry. These associations are on the drier end of the moisture gradient and may not have been considered "**wet**" since "riparian" types were more narrowly defined during the earlier upland workshops. There were no riparian plant associations in zone 2.

Plant association groups were then stratified by physiognomy, or structure. Riparian environments are extremely dynamic in terms of the processes and disturbances acting upon them, such as flooding, grazing, and fire. Structure is a surrogate for the successional

stage of existing vegetation patterns, plant associations in this case, resulting from the interaction of the environment, processes, and disturbances. Because, the plant associations came from the UNESCO physiognomic framework, a vegetation key was developed which would not conflict with UNESCO. Vegetation types were initially labeled by the overstory:

Trees with >60% cover.....CLOSE D FOREST'= FC
 Trees with 25-60% cover.....OP EN FOREST - FO
 Trees 10-25%, shrubs >25% cover.....TREE D SHRUBLAND = TS
 Trees <10%, shrubs >25% cover.....SHRUB LAND = S
 Trees 10-25%, herbs >10% cover.....TREE D HERBLAND = TH
 Shrubs 10-25%, herbs >10% cover.....SHRUBE D HERBLAND = SH
 Trees <10%, shrubs <10%, herbs >10% cover...HERB LAND = H

For both Open and Closed Forests, **PAGs** were further refined by the **lifeform** and height of the characteristic understory species as follows:

'Shrubs, >2 m tall.....(ST)
 Shrubs, .5-2 m tall.....(SM)
 Shrubs, <.5 m tall.....(SL)
 Herbaceous, >1 m tall.....(HT)
 Herbaceous, .5-1 m tall.....(HM)
 Herbaceous, <.5 m tall.....(HL)

For Shrublands and Herblands, **PAGs** were further refined by the **lifeform** and height of the named overstory species with the same divisions as those for Forests:

Shrubs, >2 m tall.....(ST)
 Shrubs, .5-2 m tall.....(SM)
 Shrubs, <.5 m tall.....(SL)
 Herbaceous, >1 m tall.....(HT)
 Herbaceous, .5-1 m tall.....(HM)
 Herbaceous, c.5 m tall.....(HL)

The last criterion used was moisture phase. Although the associations had initially been grouped along upland temperature/moisture gradients in the earlier potential vegetation workshops, these gradients were associated with upland vegetation types. The riparian types, which were a subset of this work, were consistently categorized as "**wet**" when compared to the other upland vegetation. There is a recognition that water regime strongly influences riparian vegetation distribution. Within a riparian ecosystem, there can be steep localized moisture gradients influenced by various factors (e.g., soil type, associated plant available **water**, distance from the stream, depth to water table) which are reflected on the landscape by the formation and distribution of distinct riparian plant associations.

The riparian **PAGs** were assigned to a moisture phase, based on three classes: high moisture, moderate moisture, and low moisture. The

three classes are ranked relative to the plant associations in each PAG. These classes were assigned a numerical code as follows:

- 1 = High Moisture
- 2 = Moderate Moisture
- 3 = Low Moisture

The moisture phase class equates indicator species with wetness. Based upon the undergrowth species in each PAG, it reflects site wetness and plant available water.

In summary, each riparian plant association was grouped based on upland zone, structure (physiognomy), and moisture phase. The resulting plant association groups are in Table 2.

Since plot data coverage was incomplete across the ICB, workshop participants identified published and ongoing riparian vegetation classifications which had constancy/average cover tables for the plant associations and community types. Constancy/average cover tables are an abstract portrayal of the species present and their abundance across all plots within a type. Since they display the average species composition, they represent the modal characteristics for that type. Seventy-one PAG constancy/average cover tables and descriptions were generated from 523 constancy/average cover tables, derived from 33 classifications. Composite constancy/cover tables **were** generated that reflect the various classifications used. For example, an **ABILAS/CALCAN h.t.** which had 7 different author/classification references would have a constancy/average cover summary table created from those 7 different constancy/average cover tables.

The following are descriptions of the 71 Plant Association Groups (PAG) as generated from their constancy/average cover tables.

II.C. PAG'S - (See Table 2 for complete Plant Association Group listings and Appendix I for reference list)

PAG 1FC (ST) 1

Sample Size = 7

Forested Class Zone 1, cold and wet environments -- Closed forest with tall shrub undergrowth, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : PICEA/CORSTO (49,151); POPTRE/CORSTO (49,85,90); POPBAL/CORSTO (49,85).

Picea engelmannii, *Populus tremuloides*, *P. balsamifera*, and/or *Betula papyrifera* are the dominant overstory trees. **Cornus stolonifera** dominates the understory, with other shrubs present such as *Symphoricarpos albus*, *Salix boothii* and/or *S. scouleriana*. Herbaceous species which reflect cold, wet conditions include *Galium triflorum* and *Smilacina stellata*, as well as various species of *Equisetum*.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
<i>Betula papyrifera</i>	43	(36)	[23-63]
<i>Picea</i> spp.	29	(15)	[2-27]
<i>Picea engelmannii</i>	43	(12)	[1-33]
<i>Populus balsamifera</i>	57	(35)	[3-50]
<i>Populus tremuloides</i>	71	(15)	[1-56]
SHRUBS			
Cornus stolonifera	100	(42)	[1-84]
<i>Ribes lacustre</i>	57	(10)	[1-17]
<i>Rosa woodsii</i>	57	(8)	[2-20]
<i>Salix boothii</i>	57	(17)	[7-34]
<i>Salix planifolia</i>	43	(11)	[1-30]
<i>Salix scouleriana</i>	71	(11)	[3-40]
<i>Symphoricarpos albus</i>	86	(11)	[1-30]
GRAMINOIDS			
<i>Agrostis stolonifera</i>	57	(4)	[1-9]
<i>Calamagrostis canadensis</i>	57	(8)	[1-27]
Elymus glaucus	86	(8)	[1-27]
FORBS			
<i>Actaea rubra</i>	86	(7)	[1-20]
<i>Galium triflorum</i>	100	(4)	[2-10]
<i>Mentha arvensis</i>	57	(6)	[1-10]
<i>Osmorhiza chilensis</i>	57	(3)	[1-5]
<i>Smilacina stellata</i>	100	(3)	[1-8]
<i>Thalictrum occidentale</i>	71	(3)	[1-8]
FERNS & ALLIES			
<i>Equisetum arvense</i>	57	(10)	[2-23]
<i>Equisetum hyemale</i>	57	(4)	[2-5]

PAG 1FC(ST)2

Sample Size = 7

Forested Class Zone 1, cold and wet environments -- Closed forest with tall shrub undergrowth, moderate soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : ABIAMA/ACECIR (54,55,146) ; ABIGRA/ACECIR (134,136,146) ; THUPLI/TAXBRE/ASACAU (23) .

The dominant overstory trees include *Abies amabilis*, *A. grandis*, *Pseudotsuga menziesii*, and/or *Thuja plicata*. The understory is dominated by *Acer circinatum*, with other frequently occurring shrub species e.g., (*Taxus brevifolia*, *Linnaea borealis*, *Rosa gymnocarpa*, and *Chimaphila umbellata*) . Herbaceous species include *Trifolium latifolium*, *Clintonia uniflora* and/or *Achlys triphylla* as moist site indicators.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
<i>Abies amabilis</i>	43	(15)	[13-19]
<i>Abies grandis</i>	100	(18)	[3-28]
<i>Pseudotsuga menziesii</i>	100	(29)	[3-42]
<i>Thuja plicata</i>	29	(40)	[7-73]
SHRUBS			
<i>Acer circinatum</i>	86	(28)	[12-51]
<i>Chimaphila umbellata</i>	100	(4)	[1-10]
<i>Linnaea borealis</i>	100	(10)	[1-18]
<i>Rosa gymnocarpa</i>	100	(3)	[1-6]
<i>Taxus brevifolia</i>	43	(11)	[5-18]
FORBS			
<i>Achlys triphylla</i>	71	(9)	[1-15]
<i>Asarum caudatum</i>	43	(6)	[5-7]
<i>Clintonia uniflora</i>	86	(5)	[2-8]
<i>Smilacina stellata</i>	86	(8)	[1-18]
<i>Trifolium latifolium</i>	86	(3)	[2-5]

PAG 1FC (ST) 3

Sample Size = 1

Forested Class Zone 1, cold and wet environments -- Closed forest with tall shrub undergrowth, low soil moisture:

PLANT ASSOCIATIONS (REFERENCES CODES): ABILAS/TAXBRE (26).

Picea engelmannii dominates the overstory. **Taxus** brevifolia and Vaccinium membranaceum dominate the shrub layer. Herbaceous species include Bromus carinatus and Tiarella trifoliata.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
Abies lasiocarpa	100	(4)	[4-4]
Picea engelmannii	100	(35)	[35-35]
SHRUBS			
Taxus brevifolia	100	(12)	[12-12]
Vaccinium membranaceum	100	(30)	[30-30]
GRAMINOIDS			
Bromus carinatus	100	(18)	[18-18]
FORBS			
Tiarella trifoliata	100	(45)	[45-45]

PAG 1FC(SM) 1

Sample Size = 1

Forested Class Zone 1, cold and wet environments -- Closed forest with medium shrub undergrowth, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES): **PINCON- (POPTRE) / SPIDOU / CAREX (84)**.

The dominant overstory includes **Pinus contorta** and *Populus tremuloides*. *Spiraea douglasii* dominates the undergrowth, with a high cover of *Carex eurycarpa* in the herbaceous layer, indicating cold, wet sites.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
Pinus contorta	100	(32)	[32-32]
<i>Populus tremuloides</i>	100	(60)	[60-60]
SHRUBS			
<i>Spiraea douglasii</i>	100	(30)	[30-30]
GRAMINOIDS			
<i>Carex eurycarpa</i>	100	(20)	[20-20]

Forested Class Zone 1, cold and wet environments -- Closed forest with medium shrub undergrowth, moderate soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : ABIAMA/OPLHOR (14,55,64,65,146); ABILAS/RHOALB (85,143,145,146); ABILAS/RHOALB/SENTRI (64,85); THUPLI/OPLHOR (23,49,114,145); TSUHET/OPLHOR (64,65,135,146).

The dominant overstory consists of conifers (*Abies amabilis*, *A. lasiocarpa*, *Pseudotsuga menziesii*, *Thuja plicata*, and/or *Tsuga heterophylla*). *Oplopanax horridus* and/or *Rhododendron albiflorum* and various species of *Vaccinium* dominate the undergrowth. The herbaceous layer has low graminoid cover and various forbs and ferns, including *Clintonia uniflora*, *Smilacina stellata*, *Gymnocarpium dryopteris*, and *Athyrium filix-femina*, reflecting moist soil conditions.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
<i>Abies amabilis</i>	47	(21)	[1-47]
<i>Abies lasiocarpa</i>	47	(15)	[1-48]
<i>Pseudotsuga menziesii</i>	74	(18)	[5-35]
<i>Thuja plicata</i>	74	(23)	[2-59]
<i>Tsuga heterophylla</i>	95	(26)	[1-59]
SHRUBS			
<i>Cornus canadensis</i>	53	(2)	[1-5]
<i>Linnaea borealis</i>	68	(4)	[1-10]
<i>Menziesia ferruginea</i>	58	(9)	[1-33]
<i>Oplopanax horridus</i>	63	(23)	[6-43]
<i>Rhododendron albiflorum</i>	37	(25)	[1-42]
<i>Rubus parviflorus</i>	53	(4)	[1-11]
<i>Vaccinium membranaceum</i>	68	(9)	[1-24]
<i>Vaccinium myrtillus</i>	26	(4)	[1-12]
<i>Vaccinium ovalifolium</i>	26	(7)	[1-20]
<i>Vaccinium scoparium</i>	32	(8)	[1-21]
FORBS			
<i>Clintonia uniflora</i>	90	(5)	[1-11]
<i>Galium triflorum</i>	63	(3)	[1-5]
<i>Senecio triangularis</i>	37	(3)	[1-9]
<i>Smilacina stellata</i>	74	(7)	[1-25]
<i>Tiarella trifoliata</i>	37	(12)	[5-21]
FERNS & ALLIES			
<i>Athyrium filix-femina</i>	79	(12)	[3-29]
<i>Gymnocarpium dryopteris</i>	79	(16)	[1-41]

PAG 1FC(SM)3
Sample Size = 4

Forested Class Zone 1, cold and wet environments -- Closed forest with medium shrub undergrowth, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES): ABILAS/LEDGLA (49,85);
ABILAS/OPLHOR (114).

The dominant overstory includes *Abies lasiocarpa*, *Picea* spp. and/or *Pinus contorta*. *Ledum glandulosum* and/or *Oplopanax horridus* shrubs dominate the undergrowth with other shrubs present. Herbaceous species include *Calamagrostis canadensis*, *Carex scopulorum*, *Tiarella trifoliata*, *Veratrum viride*, and/or *Viola macloskeyi*.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
<i>Abies lasiocarpa</i>	100	(15)	[7-26]
<i>Picea</i> spp.	50	(32)	[28-36]
<i>Picea engelmannii</i>	50	(31)	[31-31]
<i>Pinus contorta</i>	75	(14)	[6-20]
SHRUBS			
<i>Ledum glandulosum</i>	75	(35)	[20-48]
<i>Linnaea borealis</i>	100	(13)	[8-20]
<i>Oplopanax horridus</i>	25	(38)	[38-38]
<i>Vaccinium scoparium</i>	100	(26)	[1-44]
GRAMINOIDS			
<i>Calamagrostis canadensis</i>	75	(9)	[3-21]
<i>Carex scopulorum</i>	50	(21)	[20-22]
FORBS			
<i>Arnica latifolia</i>	75	(8)	[7-11]
<i>Osmorhiza chilensis</i>	100	(2)	[1-5]
<i>Tiarella trifoliata</i>	50	(7)	[1-12]
<i>Veratrum viride</i>	75	(5)	[1-12]
<i>Viola macloskeyi</i>	50	(17)	[3-30]

PAG 1FC (SL) 1

Sample Size = 13

Forested Class Zone 1, cold and wet environments -- Closed forest with low shrub undergrowth, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : ABIGRA/VACCES (128,145); ABILAS/VACCES (93,114,128,143,145,149); PINCON-(POPTRE)/VACULI (84); PSEMEN/VACCES (23,114,143).

The overstory includes dominants, *Pinus contorta* and *Pseudotsuga menziesii*, with *Picea engelmannii*, *Abies lasiocarpa* and *A. grandis* also present. *Vaccinium* species dominate the undergrowth with other shrub species present such as *Arctostaphylos uva-ursi* and *Pachistima myrsinites*. Herbaceous species include *Calamagrostis rubescens*, *Fragaria virginiana* and/or *Smilacina stellata*, reflecting wet sites.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
Abies grandis	39	(14)	[1-41]
<i>Abies lasiocarpa</i>	77	(10)	[1-27]
<i>Larix occidentalis</i>	62	(14)	[1-20]
<i>Picea engelmannii</i>	77	(10)	[1-33]
Pinus contorta	92	(36)	[14-58]
<i>Pseudotsuga menziesii</i>	85	(15)	[3-29]
SHRUBS			
<i>Arctostaphylos uva-ursi</i>	77	(12)	[1-36]
<i>Linnaea borealis</i>	69	(11)	[1-19]
<i>Pachistima myrsinites</i>	77	(6)	[1-32]
<i>Shepherdia canadensis</i>	69	(4)	[2-9]
<i>Spiraea betulifolia</i>	69	(5)	[1-14]
<i>Vaccinium cespitosum</i>	85	(16)	[1-47]
<i>Vaccinium scoparium</i>	77	(9)	[1-20]
GRAMINOIDS			
<i>Calamagrostis rubescens</i>	69	(27)	[17-37]
<i>Carex geyeri</i>	46	(13)	[1-23]
FORBS			
Arnica cordifolia	69	(4)	[2-6]
<i>Fragaria virginiana</i>	46	(5)	[1-17]
<i>Smilacina stellata</i>	46	(2)	[1-7]

PAG 1FC (SL) 3

Sample Size = 17

Forested Class Zone 1, cold and wet environments -- Closed forest with low shrub undergrowth, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : ABIGRA/LINBOR
(23, 26, 73, 75, 128, 136); ABILAS/CORCAN (145); ABILAS/LINBOR
(73, 75, 127, 128, 143, 145, 146).

The overstory includes *Abies grandis*, *A. lasiocarpa*, *Picea engelmannii*, and/or *Pseudotsuga menziesii*. *Linnaea borealis* shrubs dominate the undergrowth with other shrubs present such as *Cornus canadensis*, *Spiraea betulifolia*, and *Symphoricarpos albus*. Herbaceous species include *Arnica cordifolia*, *Fragaria vesca* and/or *Thalictrum occidentale*.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
<i>Abies grandis</i>	65	(24)	[2-51]
<i>Abies lasiocarpa</i>	77	(19)	[6-37]
<i>Picea engelmannii</i>	94	(22)	[1-43]
<i>Pinus contorta</i>	94	(16)	[1-43]
<i>Pseudotsuga menziesii</i>	88	(18)	[1-38]
SHRUBS			
<i>Cornus canadensis</i>	18	(6)	[1-14]
<i>Linnaea borealis</i>	100	(19)	[4-59]
<i>Ribes lacustre</i>	88	(4)	[1-35]
<i>Rosa gymnocarpa</i>	77	(3)	[1-10]
<i>Spiraea betulifolia</i>	82	(5)	[1-15]
<i>Symphoricarpos albus</i>	71	(8)	[1-50]
<i>Vaccinium scoparium</i>	65	(7)	[1-36]
GRAMINOIDS			
<i>Calamagrostis rubescens</i>	82	(7)	[1-26]
FORBS			
<i>Arnica cordifolia</i>	77	(5)	[1-13]
<i>Fragaria vesca</i>	65	(2)	[1-5]
<i>Pyrola secunda</i>	88	(3)	[1-9]
<i>Smilacina stellata</i>	59	(2)	[1-5]
<i>Thalictrum occidentale</i>	65	(4)	[1-15]

PAG 1FC(HT) 1
Sample Size = 20

Forested Class Zone 1, cold and wet environments -- Closed forest with tall herbaceous undergrowth, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : ABIGRA/SENTRI (23,26);
ABILAS/CALCAN (23,26,49,93,114,127,128); PICENG/CALCAN (26,49);
POPTRE/CALCAN (26,491).

The dominant overstory includes conifers (*Abies lasiocarpa*, *Picea engelmannii*, and ***Pinus contorta***) and broadleaf deciduous trees (*Populus tremuloides*). *Ribes lacustre* and *Vaccinium scoparium* are present with low cover. *Calamagrostis canadensis*, *Senecio triangularis*, *Thalictrum occidentale*, and *Equisetum arvense* indicate cold, wet sites.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
<i>Abies grandis</i>	25	(8)	[1-26]
<i>Abies lasiocarpa</i>	80	(17)	[2-35]
<i>Picea engelmannii</i>	85	(20)	[1-41]
<i>Pinus contorta</i>	75	(20)	[1-50]
<i>Populus tremuloides</i>	20	(47)	[20-70]
SHRUBS			
<i>Ribes lacustre</i>	65	(2)	[1-8]
<i>Vaccinium scoparium</i>	65	(17)	[2-39]
GRAMINOIDS			
<i>Calamagrostis canadensis</i>	85	(36)	[1-90]
<i>Carex disperma</i>	40	(3)	[1-8]
<i>Carex geyeri</i>	60	(3)	[1-15]
<i>Elymus glaucus</i>	40	(4)	[1-20]
FORBS			
<i>Arnica cordifolia</i>	60	(8)	[1-35]
<i>Senecio triangularis</i>	90	(4)	[1-10]
<i>Smilacina stellata</i>	80	(3)	[1-10]
<i>Thalictrum occidentale</i>	70	(5)	[1-15]
FERNS & ALLIES			
<i>Equisetum arvense</i>	70	(4)	[1-20]

PAG 1FC (HM) 1

Sample Size = 20

Forested Class Zone 1, cold and wet environments -- Closed forest with medium herbaceous undergrowth, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : ABIGRA/TRACAR (26,73); ABILAS/STRAMP (23,49,93,128); ABILAS/TRACAR (26,73,85,145,146); THUPLI/ATHFIL-FEM (23,49,145); TSUMER/STRAMP (23) .

The dominant overstory includes *Abies grandis*, *A. lasiocarpa*, *Picea engelmannii*, *Tsuga mertensiana*, and/or *Thuja plicata*. Shrubs such as *Linnaea borealis*, *Menziesia feruginea*, and/or *Ribes lacustre* are present with scattered cover. The understory is dominated by various herbaceous species which reflect cold, wet sites, including *Streptopus amplexifolius*, *Trautvetteria caroliniensis*, *Athyrium filix-femina*, and/or *Gymnocarpium dryopteris*.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
Abies grandis	60	(17)	[2-54]
<i>Abies lasiocarpa</i>	85	(29)	[3-87]
<i>Picea engelmannii</i>	85	(30)	[1-63]
Pinus contorta	65	(11)	[2-33]
<i>Pseudotsuga menziesii</i>	70	(7)	[1-15]
<i>Thuja plicata</i>	35	(33)	[1-71]
<i>Tsuga mertensiana</i>	20	(20)	[1-65]
SHRUBS			
<i>Linnaea borealis</i>	70	(5)	[1-16]
<i>Menziesia ferruginea</i>	50	(17)	[1-61]
<i>Ribes lacustre</i>	85	(3)	[1-14]
<i>Vaccinium globulare</i>	55	(11)	[1-33]
<i>Vaccinium membranaceum</i>	45	(9)	[1-20]
<i>Vaccinium scoparium</i>	55	(5)	[1-13]
FORBS			
<i>Actaea rubra</i>	70	(3)	[1-15]
<i>Osmorhiza chilensis</i>	80	(3)	[1-8]
<i>Streptopus amplexifolius</i>	70	(3)	[1-11]
<i>Trautvetteria caroliniensis</i>	75	(20)	[1-80]
FERNS & ALLIES			
<i>Athyrium filix-femina</i>	70	(10)	[1-45]
<i>Gymnocarpium dryopteris</i>	60	(12)	[1-41]

Forested Class Zone 1, cold and wet environments -- Closed forest with low herbaceous undergrowth, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : **ABILAS/CALLEP (128)**; **PICENG/CALLEP (93,127)**; **PICENG/CARDIS (127,128)**; **PICEA/CARDIS (127)**; **PINCON/CAREX (84,90)**; **POPTRE/CAREX (99)**.

The dominant overstory includes conifers (*Abies lasiocarpa*, *Picea* spp.) with some broadleaf trees (*Populus tremuloides*). *Ribes* spp. and *Vaccinium scoparium* are present with minor cover. Herbaceous species such as *Carex disperma*, *Calamagrostis canadensis*, *Deschampsia cespitosa*, *Senecio triangularis*, and/or *Caltha leptosepala* reflect cold wet sites.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
<i>Abies lasiocarpa</i>	70	(10)	[1-37]
<i>Picea engelmannii</i>	70	(53)	[1-85]
<i>Picea glauca</i>	30	(70)	[63-74]
<i>Picea pungens</i>	30	(25)	[1-38]
<i>Pinus contorta</i>	80	(32)	[2-61]
<i>Populus tremuloides</i>	70	(13)	[1-82]
SHRUBS			
<i>Ribes lacustre</i>	60	(5)	[2-10]
<i>Ribes montigenum</i>	50	(4)	[1-15]
<i>Vaccinium scoparium</i>	50	(16)	[1-37]
GRAMINOIDS			
<i>Calamagrostis canadensis</i>	50	(5)	[1-13]
<i>Calamagrostis rubescens</i>	20	(39)	[3-75]
<i>Carex disperma</i>	40	(24)	[3-33]
<i>Carex rossii</i>	40	(3)	[1-10]
<i>Deschampsia cespitosa</i>	40	(13)	[1-47]
FORES			
<i>Arnica cordifolia</i>	70	(4)	[1-15]
<i>Caltha leptosepala</i>	20	(4)	[3-5]
<i>Galium triflorum</i>	50	(3)	[1-5]
<i>Saxifraga arguta</i>	60	(10)	[1-19]
<i>Senecio triangularis</i>	70	(15)	[1-37]
<i>Thalictrum occidentale</i>	50	(7)	[1-15]

PAG 1FC(HL)2
Sample Size = 23

Forested Class Zone 1, cold and wet environments -- Closed forest with low herbaceous undergrowth, moderate soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : ABIAMA/ACHTRI
(14,54,65,146); ABIGRA/ACHTRI (134,136,146); PICENG/EQUARV
(84,85,93,112,114,127,143,145,151); PICEA/EQUARV (49,114,149);
THUPLI/ACHTRI (134); TSUHET/ACHTRI (64,135,146).

Picea engelmannii dominates the overstory, with Abies lasiocarpa and Pseudotsuga menziesii also present. Linnaea borealis and Symphoricarpos **albus** are present with minor cover. Herbaceous species which reflect cold, moist site conditions include Achlys triphylla, Clintonia uniflora, and/or Equisetum arvense.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
Abies amabilis	35	(13)	[1-42]
Abies grandis	44	(16)	[1-29]
Abies lasiocarpa	57	(14)	[5-29]
Picea engelmannii	65	(35)	[5-79]
Pseudotsuga menziesii	78	(22)	[1-57]
Thuja plicata	39	(10)	[1-18]
SHRUBS			
Acer circinatum	44	(14)	[2-27]
Berberis nervosa	48	(8)	[2-16]
Linnaea borealis	70	(7)	[2-20]
Symphoricarpos albus	57	(4)	[1-28]
GRAMINOIDS			
Calamagrostis canadensis	39	(7)	[1-27]
Elymus glaucus	26	(3)	[1-7]
FORBS			
Achlys triphylla	26	(14)	[6-27]
Actea rubra	48	(5)	[1-14]
Clintonia uniflora	61	(4)	[1-7]
Osmorhiza chilensis	65	(3)	[1-21]
Smilacina stellata	91	(4)	[1-12]
FERNS & ALLIES			
Equisetum arvense	48	(41)	[1-74]

PAG 1FC (HL) 3

Sample Size = 54

Forested Class Zone 1, cold and wet environments -- Closed forest with low herbaceous undergrowth, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : **ABIGRA/ASACAU** (23);
ABIGRA/CLIUNI (23, 26, 73, 75, 114, 128, 145); **ABIGRA/TRILAT** (75, 136);
ABILAS/ACTRUB (49, 93, 112, 127, 149); **ABILAS/CLIUNI**
(23, 73, 75, 114, 145); **ABILAS/GALTRI** (49, 114); **PICENG/CLIUNI** (84);
PICENG/GALTRI (127, 151); **PICEA/GALTRI** (49, 114); **PICEA/SMISTE**
(114, 136); **THUPLI/ARANUD** (145); **THUPLI/ASACAU** (23); **THUPLI/GYMDRY**
(23, 49); **TSUHET/GYMDRY** (23, 49, 85, 145); **TSUMER/CLIUNI** (23, 65).

Picea spp., ***Abies grandis***, and/or *A. lasiocarpa* dominate the overstory, typically with *Pseudotsuga menziesii*. Various shrubs are present. There are numerous herbaceous species, particularly forbs, including *Calamagrostis rubescens*, *Clintonia uniflora*, ***Galium triflorum***, *Tiarella trifoliata*, and *Smilacina stellata*.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
<i>Abies grandis</i>	74	(27)	[1-62]
<i>Abies lasiocarpa</i>	85	(16)	[1-54]
<i>Larix occidentalis</i>	72	(12)	[2-39]
<i>Picea</i> spp.	6	(59)	[45-66]
<i>Picea engelmannii</i>	91	(23)	[1-66]
<i>Pinus contorta</i>	74	(13)	[1-32]
<i>Pseudotsuga menziesii</i>	94	(17)	[1-49]
SHRUBS			
<i>Acer glabrum</i>	61	(7)	[1-40]
<i>Alnus sinuata</i>	52	(6)	[1-25]
<i>Amelanchier alnifolia</i>	85	(2)	[1-5]
<i>Berberis repens</i>	63	(2)	[1-7]
<i>Linnaea borealis</i>	89	(13)	[1-47]
<i>Lonicera utahensis</i>	69	(2)	[1-9]
<i>Pachistima myrsinites</i>	80	(4)	[1-23]
<i>Rubus parviflorus</i>	83	(4)	[1-16]
<i>Spiraea betulifolia</i>	76	(4)	[1-27]
<i>Symphoricarpos albus</i>	78	(5)	[1-17]
<i>Vaccinium globulare</i>	63	(14)	[1-46]
GRAMINOIDS			
<i>Bromus vulgaris</i>	63	(3)	[1-37]
<i>Calamagrostis rubescens</i>	56	(8)	[1-23]
FORBS			
<i>Actea rubra</i>	72	(3)	[1-16]
<i>Adenocaulon bicolor</i>	61	(4)	[1-20]
<i>Arabis nuttallii</i>	19	(11)	[1-33]
<i>Arnica cordifolia</i>	67	(7)	[1-26]

Asarum caudatum	32	(3)	[1-6]
Clintonia uniflora	76	(5)	[1-14]
Galium triflorum	91	(2)	[1-6]
Goodyera oblongifolia	65	(2)	[1-20]
Osmorhiza chilensis	87	(2)	[1-11]
Pedicularis racemosa	50	(2)	[1-11]
Smilacina stellata	93	(4)	[1-21]
Tiarella trifoliata	65	(5)	[1-28]
Trientalis latifolia	6	(2)	[2-3]
Viola orbiculata	74	(2)	[1-6]

PAG 1FC(ST)1
Sample Size = 2

Forested Class Zone 1, cold and wet environments -- Open forest with tall shrub undergrowth, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES): **ABILAS/ALNSIN** (26,114).

The open canopy is dominated by *Abies lasiocarpa* and/or *Picea engelmannii*. *Alnus sinuata* dominates the undergrowth. The herbaceous layer has minor cover of *Arnica* species.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
<i>Abies lasiocarpa</i>	50	(28)	[28-28]
<i>Picea engelmannii</i>	100	(17)	[10-24]
SHRUBS			
<i>Alnus sinuata</i>	100	(45)	[36-53]
<i>Ribes lacustre</i>	100	(3)	[1-5]
<i>Vaccinium globulare</i>	50	(11)	[11-11]
FORBS			
<i>Arnica cordifolia</i>	100	(8)	[2-13]
<i>Arnica latifolia</i>	50	(20)	[20-20]

PAG 1FO(SM) 2
Sample Size = 1

Forested Class Zone 1, cold and wet environments -- Open forest with medium shrub undergrowth, moderate soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : ABILAS/VACSCO-LEDUM (85).

Picea engelmannii dominates the open **overstory**. *Ledum glandulosum* and/or *Vaccinium scoparium* dominate the undergrowth, indicating moist sites. Herbaceous cover is minor.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
<i>Abies lasiocarpa</i>	100	(7)	[7-7]
<i>Picea engelmannii</i>	100	(31)	[31-31]
SHRUBS			
<i>Ledum glandulosum</i>	100	(20)	[20-20]
<i>Vaccinium scoparium</i>	100	(44)	[44-44]

Sample Size = 10

Forested Class Zone 1, cold and wet environments -- Open forest with medium shrub undergrowth, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : POPTRE/SYMALB/ELYGLA (84,143,150); POPTRE/SYMORE/BROCAR (97,99,150); POPTRE/SYMORE/CARUTR (97); POPTRE/SYMORE/TALL FORB (97,98,99).

Populus tremuloides dominates the open canopy, with minor conifer cover. Symphoricarpos oreophilus dominates the shrub layer with Rosa woodsii and Symphoricarpos **albus** also present. Bromus carinatus, Elymus glaucus, Thalictrum fendleri, and/or Nemophila breviflora are present in the herbaceous layer.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
Populus tremuloides	100	(60)	[1-95]
SHRUBS			
Pachistima myrsinites	70	(5)	[1-10]
Rosa woodsii	90	(4)	[1-13]
Syrnphoricarpos albus	40	(49)	[38-60]
Symphoricarpos oreophilus	80	(30)	[24-32]
GRAMINOIDS			
Bromus carinatus	80	(11)	[1-25]
Carex rossii	30	(1)	[1-1]
Elymus glaucus	80	(14)	[9-24]
FORBS			
Lathyrus latifolius	60	(13)	[1-19]
Nemophila breviflora	70	(17)	[1-66]
Thalictrum fendleri	80	(4)	[1-11]

PAG 1FO (SL) 1
Sample Size = 1

Forested Class Zone 1, cold and wet environments -- Open forest with low shrub undergrowth, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : ABILAS/VACMYR (26)..

The open overstory is dominated by *Abies lasiocarpa*. *Picea engelmannii* is present with minor cover. *Vaccinium myrtillus* and *Linnaea borealis* dominate the undergrowth, indicating wet sites. *Arnica cordifolia* is the only herbaceous species present in this type. \

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
<i>Abies lasiocarpa</i>	100	(20)	[20-20]
<i>Picea engelmannii</i>	100	(6)	[6-6]
SHRUBS			
<i>Linnaea borealis</i>	100	(20)	[20-20]
<i>Vaccinium myrtillus</i>	100	(60)	[60-60]
FORBS			
<i>Arnica cordifolia</i>	100	(22)	[22-22]

PAG 1FO(SL)3

Sample Size = 17

Forested Class Zone 1, cold and wet environments -- Open forest with low shrub undergrowth, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : ABILAS/VACSCO
(75, 93, 114, 127, 128, 143, 145, 146) .

The open overstory is dominated by *Abies lasiocarpa* and *Pinus contorta*. *Picea engelmannii* is present with variable cover. *Vaccinium scoparium* dominate the low shrub undergrowth, with other shrubs such as *Juniperus communis* or *Pachistima myrsinites* present. The herbaceous layer includes *Arnica cordifolia*, *Arnica latifolia*, and *Pyrola secunda*.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
<i>Abies lasiocarpa</i>	100	(23)	[4-45]
<i>Picea engelmannii</i>	94	(16)	[1-36]
<i>Pinus contorta</i>	100	(30)	[11-53]
SHRUBS			
<i>Juniperus communis</i>	65	(4)	[1-8]
<i>Pachistima myrsinites</i>	65	(4)	[1-15]
<i>Vaccinium scoparium</i>	94	(41)	[10-74]
GRAMINOIDS			
<i>Calamagrostis rubesens</i>	71	(14)	[1-38]
FORBS			
<i>Arnica cordifolia</i>	100	(6)	[1-20]
<i>Arnica latifolia</i>	71	(5)	[1-19]
<i>Pyrola secunda</i>	94	(2)	[1-8]

PAG 1FO(HL)1

Sample Size = 17

Forested Class Zone 1, cold and wet environments -- Open forest with low herbaceous undergrowth, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES): ABILAS-PICENG/CARSCO (85).

The open overstory is dominated by *Picea engelmannii*, with low cover of **Abies lasiocarpa** and **Pinus contorta**. Shrub cover is minor. The understory is dominated by *Carex scopulorum*, with *Carex spp.* and *Equisetum sylvaticum* present, indicating cold, wet sites.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
<i>Abies lasiocarpa</i>	100	(7)	[7-7]
<i>Picea engelmannii</i>	100	(32)	[32-32]
Pinus contorta	100	(14)	[14-14]
SHRUBS			
<i>Betula glandulosa</i>	100	(12)	[12-12]
<i>Vaccinium scoparium</i>	100	(13)	[13-13]
GRAMINOIDS			
<i>Carex scopulorum</i>	1 0 0	(80)	[80-80]
<i>Carex scirpoidea</i>	100	(32)	[32-32]
FERNS & ALLIES			
<i>Equisetum sylvaticum</i>	100	(17)	[17-17]

PAG 1S (ST) 1
Sample Size = 32

Shrubland Class Zone 1, cold and wet environments -- Shrublands with tall shrubs, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : ALNINC (49, 84, 85, 90, 112);
ALNINC/CORSTO (23, 112); SALBOO-SALGEY (84, 901); SALBOO-SALGEY-SALLEM/CARLAN (84); SALBOO-SALLEM (84); SALBOO/CALCAN (112, 151);
SALBOO/CARAQU (112); SALBOO/CARUTR (84, 112, 151); SALDRU (90);
SALDRU/CALCAN (49, 85); SALDRU/CARUTR (49, 851); SALGEY-SALLEM (84);
SALGEY/CALCAN (49); SALGEY/CARAQU (112); SALGEY/CARUTR (49, 84, 90, 112, 151).

Alnus incana, *Salix boothii*, *S. drummondiana*, and/or *S. geyeriana* dominate the shrub overstory. The herbaceous layer is characterized by *Calamagrostis canadensis*, *Carex aquatilis*, and *C. utriculata*, reflecting wet sites. Forb cover varies and includes *Equisetum arvense*, *Galium triflorum*, *Heracleum lanatum*, and *Smilacina stellata*.

MOST FREQUENTLY OCCURRING SPECIES:

SHRUBS	CONSTANCY	AVG. COVER	RANGE
<i>Alnus incana</i>	59	(31)	[1-76]
<i>Cornus stolonifera</i>	4 4	(14)	[1-78]
<i>Salix boothii</i>	72	(27)	[1-72]
<i>Salix drummondiana</i>	50	(25)	[1-60]
<i>Salix geyeriana</i>	63	(26)	[1-70]
<i>Salix lemmonii</i>	13	(15)	[3-24]
<i>Salix lutea</i>	22	(17)	[1-50]
GRAMINOIDS			
<i>Calamagrostis canadensis</i>	56	(19)	[1-59]
<i>Carex aquatilis</i>	59	(17)	[1-59]
<i>Carex lanuginosa</i>	53	(8)	[1-29]
<i>Carex utriculata</i>	66	(30)	[1-80]
<i>Deschampsia cespitosa</i>	63	(5)	[1-25]
<i>Poa pratensis</i>	72	(9)	[1-50]
FORBS			
<i>Galium triflorum</i>	75	(4)	[1-40]
<i>Heracleum lanatum</i>	41	(6)	[1-29]
<i>Smilacina stellata</i>	78	(4)	[1-40]
FERNS & ALLIES			
<i>Equisetum arvense</i>	84	(9)	[1-85]

PAG 1S (ST) 2

Sample Size = 25

Shrubland Class Zone 1, cold and wet environments -- Shrublands with tall shrubs, moderate soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES): ALNSIN (26,491); .
CORSTO/HERLAN (26,49,90,112,151); SALBEB (49); SALBOO/CARNEB (90);
SALBOO/EQUARV (112,151); SALBOO/MESIC FORB (90,112,151);
SALBOO/MESIC GRAMINOID (90,112); SALGEY/DESCES (112); SALGEY/MESIC
FORB (112,151); SALGEY/MESIC GRAMINOID (90,112,151); SALGEY/POAPAL
(151).

Cornus stolonifera, *Salix boothii*, and/or *S. geyeriana* dominate the shrub overstory. The herbaceous layer includes various species reflecting cold, moist sites such as *Carex* spp., *Glyceria striata*, *Poa palustris*, *Equisetum arvense*, *Mertensia ciliata*, and/or *Actaea rubra*.

MOST FREQUENTLY OCCURRING SPECIES:

SHRUBS	CONSTANCY	AVG. COVER	RANGE
<i>Alnus sinuata</i>	16	(47)	[2-80]
<i>Cornus stolonifera</i>	56	(40)	[1-92]
<i>Lonicera involucrata</i>	60	(9)	[1-50]
<i>Ribes inerme</i>	68	(10)	[1-39]
<i>Ribes lacustre</i>	52	(6)	[1-22]
<i>Salix boothii</i>	72	(32)	[3-67]
<i>Salix drummondiana</i>	56	(28)	[3-70]
<i>Salix exigua</i>	40	(11)	[1-46]
<i>Salix geyeriana</i>	52	(46)	[18-84]
<i>Salix lasiandra</i>	48	(11)	[1-40]
GRAMINOIDS			
<i>Carex nebrascensis</i>	36	(6)	[1-25]
<i>Carex utriculata</i>	60	(8)	[1-44]
<i>Glyceria striata</i>	48	(9)	[1-45]
<i>Juncus balticus</i>	48	(11)	[1-33]
<i>Poa palustris</i>	64	(11)	[1-46]
<i>Poa pratensis</i>	72	(11)	[1-44]
FORBS			
<i>Actaea rubra</i>	52	(7)	[1-60]
<i>Aster eatonii</i>	24	(16)	[3-24]
<i>Aster foliaceus</i>	48	(7)	[1-40]
<i>Mertensia ciliata</i>	64	(7)	[1-35]
<i>Smilacina stellata</i>	80	(6)	[1-26]
<i>Solidago canadensis</i>	52	(7)	[1-16]
FERNS & ALLIES			
<i>Equisetum arvense</i>	64	(13)	[1-85]

PAG 1S (ST) 3

Sample Size = 5

Shrubland Class Zone 1, cold and wet environments -- Shrublands with tall shrubs, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : **SALBOO/POAPRA (90,112,151); SALGEY/POAPRA (49,151).**

The shrub overstory is dominated by *Salix boothii* and *S. geyeriana*. The herbaceous undergrowth is dominated by *Poa pratensis*, indicating disturbance. Other species reflecting damp sites include *Agrostis stolonifera*, *Poa palustris*, *Carex microptera*, *Geum macrophyllum* and/or *Smilacina stellata*.

MOST FREQUENTLY OCCURRING SPECIES:

SHRUBS	CONSTANCY	AVG. COVER	RANGE
<i>Ribes inerne</i>	80	(6)	[3-11]
<i>Salix boothii</i>	100	(39)	[18-56]
<i>Salix drummondiana</i>	80	(21)	[2-51]
<i>Salix geyeriana</i>	100	(39)	[8-62]
GRAMINOIDS			
<i>Agrostis stolonifera</i>	100	(11)	[4-20]
<i>Carex microptera</i>	80	(8)	[2-21]
<i>Juncus balticus</i>	80	(5)	[1-10]
<i>Poa palustris</i>	80	(16)	[3-46]
<i>Poa pratensis</i>	100	(20)	[6-33]
FORBS			
<i>Aconitum columbianum</i>	60	(10)	[2-17]
<i>Geum macrophyllum</i>	100	(3)	[1-8]
<i>Smilacina stellata</i>	100	(2)	[1-5]

PAG 1S(SM)1

Sample Size = 8

Shrubland Class Zone 1, cold and wet environments -- Shrublands with medium shrubs, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES): **BETGLA/CARUTR (49); SALCAN/CARUTR (49); SALEAS (90); SALEAS/CARAQU (90); SALFAR/CARUTR (85); SALPLA/CARAQU (49,90); SALPLA/CARSCO (90).**

Varous willows, (*Salix candida*, *S. planifolia*, *S. eastwoodiae*, and/or *S. farriae*) dominate the overstory. The herbaceous undergrowth reflects cold, wet sites and includes *Carex aquatilis*, *C. scopulorum*, *C. utriculata*, and/or *C. simulata*.

MOST FREQUENTLY OCCURRING SPECIES:

SHRUBS	CONSTANCY	AVG. COVER	RANGE
<i>Betula glandulosa</i>	38	(8)	[1-15]
<i>Salix candida</i>	25	(25)	19-401
<i>Salix eastwoodiae</i>	50	(30)	[5-54]
<i>Salix farriae</i>	13	(35)	[35-35]
<i>Salix geyeriana</i>	50	(18)	[3-35]
<i>Salix planifolia</i>	88	(25)	[2-61]
GRAMINOIDS			
<i>Carex aquatilis</i>	100	(16)	[1-34]
<i>Carex utriculata</i>	75	(25)	[11-35]
<i>Carex scopulorum</i>	63	(41)	[30-48]
<i>Carex simulata</i>	63	(26)	[1-50]
<i>Deschampsia cespitosa</i>	75	(11)	[2-25]
FORBS			
<i>Lupinus polyphyllus</i>	25	(5)	[5-5]
<i>Pedicularis groenlandica</i>	63	(3)	[1-5]
<i>Ranunculus sceleratus</i>	13	(40)	[40-40]

PAG 1S (SM) 2

Sample Size = 4

Shrubland Class Zone 1, cold and wet environments -- Shrublands with medium shrubs, moderate soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : POTFRU/DESCES
(26, 49, 112, 151) .

Potentilla fruticosa and Artemisia **cana** 'dominate the overstory. The herbaceous undergrowth indicates moist sites and includes Carex microptera, Fragaria virginiana, Polygonum bistortoides, and/or Deschampsia cespitosa.

MOST FREQUENTLY OCCURRING SPECIES:

SHRUBS	CONSTANCY	AVG. COVER	RANGE
Artemisia cana	75	(31)	[3-80]
Potentilla fruticosa	100	(32)	[25-48]
GRAMINOIDS			
Carex microptera	75	(17)	[8-30]
Deschampsia cespitosa	100	(28)	[15-40]
Poa pratensis	100	(13)	[5-23]
FORBS			
Aster spp.	75	(6)	[3-10]
Fragaria virginiana	75	(14)	[1-23]
Polygonum bistortoides	75	(14)	[3-35]
Potamogeton gramineus	50	(11)	[6-15]

PAG 1S (SM) 3
Sample Size = 4

Shrubland Class Zone 1, cold and wet environments -- Shrublands with medium shrubs, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : POTFRU/POAPRA (26,612); ROSWOO (49,90).

Potentilla fruticosa and/or Rosa woodsii dominate the overstory. Poa pratensis dominates the undergrowth indicating disturbance, along with Taraxacum officinale and Humulus lupulus. Agrostis stolonifera and Juncus balticus are also present.

MOST FREQUENTLY OCCURRING SPECIES:

SHRUBS	CONSTANCY	AVG. COVER	RANGE
Pentaphylodes floribunda	50	(40)	[39-40]
Rosa woodsii	50	(55)	[28-81]
Symphoricarpos albus	50	(8)	[1-14]
GRAMINOIDS			
Agropyron caninum	50	(13)	[10-15]
Agrostis stolonifera	100	(20)	[5-40]
Juncus balticus	100	(6)	[2-12]
Poa pratensis	100	(31)	[21-47]
FORBS			
Achillea millefollium	75	(8)	[1-20]
Fragaria virginiana	75	(16)	[12-22]
Galium boreale	50	(7)	[6-7]
Geum macrophyllum	50	(6)	[2-10]
Humulus lupulus	50	(23)	[5-40]
Taraxacum officinale	75	(9)	[3-21]

PAG 1S (SL) 1

Sample Size = 5

Shrubland Class Zone 1, cold and wet environments -- Shrublands with low shrubs, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : KALMIC/CARSCO (49); SALWOL/CARAQU (49, 90, 151); SALWOL/CARUTR (151).

Salix wolfii and/or Kalmia microphylla dominate the overstory. The herbaceous undergrowth indicates cold, wet sites and includes Carex scopulorum, C. utriculata, C. aquatilis, Polygonum bistortoides and/or Ligusticum tenuifolium.

MOST FREQUENTLY OCCURRING SPECIES:

SHRUBS	CONSTANCY	AVG. COVER	RANGE
Betula glandulosa	60	(20)	[9-30]
Kalmia microphylla	20	(24)	[24-24]
Salix orestera	20	(80)	[80-80]
Salix wolfii	80	(59)	[53-69]
GRAMINOIDS			
Carex aquatilis	100	(42)	[15-60]
Carex lanuginosa	40	(34)	[3-65]
Carex microptera	80	(12)	[2-30]
Carex utriculata	60	(29)	[3-56]
Deschampsia cespitosa	100	(7)	[1-16]
FORBS			
Aster foliaceus	60	(14)	[6-28]
Ligusticum tenuifolium	40	(21)	[7-35]
Polygonum bistortoides	80	(4)	[1-10]

PAG 1S(SL)2

Sample Size = 5

Shrubland Class Zone 1, cold and wet environments -- Shrublands with low shrubs, moderate soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : ARTCAN/DESCES (90,112,151); ARTCAN/CARNEB-POAFEN (90); SALWOL/DESCES (49); SALWOL/MESIC FORB (90,151).

Artemisia cana and/or *Salix wolfii* dominate the overstory. The herbaceous undergrowth indicates cold, moist sites and includes *Carex lanuginosa*, *Deschampsia cespitosa*, *Juncus balticus*, *Poa pratensis*, and/or *Polygonum bistortoides*.

MOST FREQUENTLY OCCURRING SPECIES:

SHRUBS	CONSTANCY	AVG. COVER	RANGE
<i>Artemisia cana</i>	60	(33)	[2-54]
<i>Potentilla fruticosa</i>	60	(9)	[1-15]
<i>Salix wolfii</i>	60	(44)	[2-93]
GRAMINOIDS			
<i>Carex lanuginosa</i>	40	(26)	[1-50]
<i>Carex nebrascensis</i>	20	(7)	17-71
<i>Deschampsia cespitosa</i>	80	(15)	[2-45]
<i>Juncus balticus</i>	80	(20)	[1-43]
<i>Poa fendleriana</i>	20	(8)	[8-8]
<i>Poa pratensis</i>	80	(17)	[1-48]
FORBS			
<i>Helenium hoopesii</i>	60	(13)	[2-26]
<i>Polygonum bistortoides</i>	60	(11)	[1-29]
<i>Potamogeton gramineus</i>	80	(3)	[1-8]
<i>Taraxacum officinale</i>	80	(7)	[1-23]

PAG 1H(HT)1

Sample Size = 1

Herbland Class Zone 1, cold and wet environments -- Herblands with tall herbs, high soil moisture:.

PLANT ASSOCIATIONS (REFERENCE CODES): SCIACU (49).

The herbaceous layer is dominated by graminoids including *Eleocharis acicularis*, *Scirpus acutus*, *Scirpus pungens* and *Scirpus validus* indicating cold, wet and marshy conditions on the margins of ponds and streams.

MOST FREQUENTLY OCCURRING SPECIES:

GRAMINOIDS	CONSTANCY	AVG. COVER	RANGE
<i>Eleocharis acicularis</i>	100	(80)	[80-80]
<i>Scirpus acutus</i>	100	(65)	[65-65]
<i>Scirpus pungens</i>	100	(65)	[65-65]
<i>Scirpus validus</i> .	100	(73)	[73-73]
FORBS			
<i>Zannichellia palustris</i>	100	(80)	[80-80]

PAG 1H(HT) 3

Sample Size = 2

Herbland Class Zone 1, **cold** and wet environments -- Herblands with tall herbs, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : VERCAL (90,112). .

The herbaceous layer is dominated by *Veratrum californicum*, with *Equisetum arvense*, *Mertensia ciliata*, and *Thalictrum fendleri* also present. Graminoid cover is minor.

MOST FREQUENTLY OCCURRING SPECIES:

GRAMINOIDS	CONSTANCY	AVG. COVER	RANGE
<i>Carex microptera</i>	100	(4)	[1-6]
FORBS			
<i>Mertensia ciliata</i>	100	(23)	[14-31]
<i>Thalictrum fendleri</i>	100	(19)	[7-31]
<i>Veratrum californicum</i>	100	(74)	[66-81]
FERNS & ALLIES			
<i>Equisetum arvense</i>	50	(40)	[40-40]

PAG 1H(HM) 1

Sample Size = 12

Herbland Class Zone 1, cold and wet environments -- Herblands with medium herbs, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : **CALCAN** (26,49,85,112); **CARCUS** (85); **CARUTR** (49,84,90,112,151); **GLYBOR** (49); **POAPAL** (49).

The herbaceous layer is dominated by graminoids, either *Calamagrostis canadensis*, *Carex utriculata*, *C. cusickii*, *Glyceria borealis*, and/or *Poa palustris*, all indicating cold, wet sites. Other herbaceous species include *Carex aquatilis*, *Senecio pseud aureus*, and *Equisetum arvense*.

MOST FREQUENTLY OCCURRING SPECIES:

	CONSTANCY	AVG. COVER	RANGE
GRAMINOIDS			
<i>Agrostis stolonifera</i>	42	(10)	[1-25]
<i>Calamagrostis canadensis</i>	67	(38)	[1-84]
<i>Calamagrostis stricta</i>	17	(39)	[1-76]
<i>Carex aquatilis</i>	83	(7)	[2-18]
<i>Carex cusickii</i>	8	(49)	[49-49]
<i>Carex utriculata</i>	100	(35)	[1-90]
<i>Carex vesicaria</i>	42	(18)	[1-68]
<i>Deschampsia cespitosa</i>	83	(5)	[1-15]
<i>Glyceria borealis</i>	8	(48)	[48-48]
<i>Poa palustris</i>	33	(18)	[1-53]
<i>Poa pratensis</i>	58	(7)	[1-20]
FORBS			
<i>Geum macrophyllum</i>	58	(3)	[1-9]
<i>Pedicularis groenlandica</i>	42	(6)	[3-11]
<i>Senecio pseud aureus</i>	17	(21)	[1-40]
FERNS & ALLIES			
<i>Equisetum arvense</i>	58	(5)	[1-14]

PAG 1H(HM)2

Sample Size = 13

Herbland Class Zone 1, cold and wet environments ---Herblands with medium herbs, moderate soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : DESCES (49,75,84,85,90,112,151); DESCES-CAREX (84,90,100); SENTRI (49,841).

The herbaceous layer is dominated by *Deschampsia cespitosa*, *Carex athrostachya*, *C. lanuginosa*, and/or *Senecio triangularis*, all indicating cold, moist sites. Other frequently occurring species include *Carex microptera*, *Phalaris arundinacea*, *Polygonum bistortoides*, and *Caltha leptosepala*.

MOST FREQUENTLY OCCURRING SPECIES:

	CONSTANCY	AVG. COVER	RANGE
GRAMINOIDS			
<i>Carex athrostachya</i>	39	(20)	[10-35]
<i>Carex lanuginosa</i>	23	(24)	[1-55]
<i>Carex microptera</i>	39	(7)	[1-18]
<i>Deschampsia cespitosa</i>	85	(38)	[1-57]
<i>Phalaris arundinacea</i>	62	(4)	[1-11]
FORBS			
<i>Caltha leptosepala</i>	23	(39)	[6-60]
<i>Polygonum bistortoides</i>	62	(3)	[1-10]
<i>Senecio triangularis</i>	39	(14)	[1-35]
FERNS & ALLIES			
<i>Athrium filix-femina</i>	15	(18)	[5-30]

PAG 1E (HM) 3

Sample Size = 3

Herbland Class Zone 1, cold and wet environments -- Herblands with medium herbs, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : AGRSTO (90); FESIDA-DESCES (100); MERCIL (151).

These plant associations have low species richness. The herbaceous layer is by *Agrostis stolonifera*, *Festuca idahoensis*, and/or *Mertensia ciliata*. *Deschampsia cespitosa*, *Juncus balticus*, *Poa pratensis*, *Saxifraga arguta* and *Senecio triangularis* are present with variable cover.

MOST FREQUENTLY OCCURRING SPECIES:

GRAMINOIDS	CONSTANCY	AVG. COVER	RANGE
<i>Agrostis stolonifera</i>	33	(72)	[72-72]
<i>Deschampsia cespitosa</i>	100	(6)	[1-17]
<i>Festuca idahoensis</i>	33	(21)	[21-21]
<i>Juncus balticus</i>	67	(8)	[1-15]
<i>Poa pratensis</i>	67	(10)	[1-19]
FORBS			
<i>Mertensia ciliata</i>	33	(51)	[51-51]
<i>Potamogeton gramineus</i>	100	(3)	[1-8]
<i>Saxifraga arg-uta</i>	33	(32)	[32-32]
<i>Senecio triangularis</i>	33	(36)	[36-36]
FERNS & ALLIES			
<i>Equisetum arvense</i>	67	(3)	[1-5]

PAG 1H(HL) 1

Sample Size = 36

Herbland Class Zone 1, cold and wet environments -- Herblands with low herbs, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : CALLEP (112) ; CARAQU (49, 84, 85, 90, 112, 151) ; CARLAN (26, 84, 90, 112) ; CARLAS (49, 84, 112) ; CARLIM (49, 112) ; CARSCO (26, 49, 84, 85, 90) ; CARSIM (49, 84, 90, 151) ; ELEPAL (49, 84, 85, 90, 112) ; ELEPAU (26, 49, 84, 90) ; EQUFLU (49) ; ERIPOL (85) .

Various wet meadow species (*Caltha leptosepala*, *Carex aquatilis*, *C. lanuginosa*, *C. lasiocarpa*, *C. scopulorum*, *C. simulata*, *Eleocharis palustris*, *E. pauciflora*, and/or *Equisetum fluviatile*) dominate the herbaceous overstory, indicating cold, wet sites. *Pedicularis groenlandica* is present in minor amounts.

MOST FREQUENTLY OCCURRING SPECIES:

		AVG.	
GRAMINOIDS	CONSTANCY	COVER	RANGE
<i>Carex aquatilis</i>	72	(24)	[1-82]
<i>Carex lanuginosa</i>	33	(24)	[1-82]
<i>Carex lasiocarpa</i>	14	(38)	[1-89]
<i>Carex scopulorum</i>	25	(29)	[1-79]
<i>Carex simulata</i>	47	(24)	[1-78]
<i>Carex utriculata</i>	81	(13)	[1-85]
<i>Deschampsia cespitosa</i>	72	(6)	[1-28]
<i>Eleocharis palustris</i>	42	(24)	[1-85]
<i>Eleocharis pauciflora</i>	42	(22)	[1-75]
FORBS			
<i>Caltha leptosepala</i>	17	(19)	[1-59]
<i>Pedicularis groenlandica</i>	53	(3)	[1-12]
FERNS & ALLIES			
<i>Equisetum fluviatile</i>	8	(31)	[1-71]

PAG 1H(HL)2

Sample Size = 9

Herbland Class Zone 1, cold and wet environments -- Herblands with low herbs, moderate soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES): CARNEB (49,84,90,112,151); JUNBAL (49,90,112,151).

Carex nebrascensis and/or Juncus **balticus** dominate the herbaceous layer, indicating cold, moist sites. Various wet meadow forbs are present, including Geum macrophyllum, Mentha arvensis, Polygonum bistortoides, and Senecio hydrophilus. Equisetum arvense is also present.

MOST FREQUENTLY OCCURRING SPECIES:

		AVG.	
GRAMINOIDS	CONSTANCY	COVER	RANGE
Agrostis stolonifera	67	(14)	[1-23]
Carex nebrascensis	78	(46)	[4-84]
Carex praegracilis	89	(8)	[1-25]
Deschampsia cespitosa	89	(4)	[1-15]
Juncus balticus	89	(42)	[9-84]
Poa pratensis	89	(7)	[1-23]
FORBS			
Geum macrophylla	67	(4)	[1-10]
Mentha arvensis	44	(16)	[4-40]
Polygonum bistortoides	44	(4)	[1-10]
Senecio hydrophiloides	33	(26)	[2-40]
FERNS & ALLIES			
Equisetum arvense	67	(20)	[1-65]

PAG 1H(HL) 3

Sample Size = 8

Herbland Class Zone 1, cold and wet environments -- Herblands with low herbs, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : CARMIC (112,151); POAFEN (84); POASEC (90); POAPRA (49,84,90,112).

Carex microptera, Poa fendleriana, P. secunda, and/or P. pratensis dominate the herbaceous layer. Various forbs including Aster occidentalis, Potamogeton gramineus, and Taraxacum officinale are present with minor cover.

MOST FREQUENTLY OCCURRING SPECIES:

GRAMINOIDS	CONSTANCY	AVG. COVER	RANGE
Carex microptera	50	(34)	[1-83]
Carex nebrascensis	75	(3)	[1-10]
Deschampsia cespitosa	63	(4)	[1-7]
Juncus balticus	100	(8)	[1-30]
Poa fendleriana	38	(14)	[1-38]
Poa secunda	25	(24)	[2-46]
Poa pratensis	88	(45)	[10-77]
FORBS			
Aster occidentalis	63	(7)	[1-30]
Potamogeton gramineus	75	(5)	[2-15]
Taraxacum officinale	63	(17)	[2-33]

PAG 3FC(ST)1

Sample Size = 9

Forest Class Zone 3, warm and wet environments -- Closed forest with tall shrub undergrowth, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : POPANG/BETOCC (90,112); POPANG/CORSTO (49,90,112); POPTRE/CORSTO (49,901; POPBAL/CORSTO (49,85); POPBAL/SALEXI (90).

Populus angustifolia and/or P. balsamifera dominate the overstory canopy. **Cornus** stolonifera, Betula occidentalis, and/or Salix exigua dominate the undergrowth with various tall willows. The herbaceous layer includes Agrostis stolonifera, Smilacina stellata, and Equisetum **arvense** indicating wet sites.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
Populus angustifolia	67	(51)	[41-55]
Populus balsamifera	67	(32)	[3-60]
Populus tremuloides	56	(3)	[1-8]
SHRUBS			
Betula occidentalis	56	(35)	[5-64]
Cornus stolonifera	89	(48)	[12-85]
Prunus virginiana	67	(10)	[2-40]
Rosa woodsii	67	(9)	[2-20]
Salix exigua	44	(27)	[3-45]
Salix lasiandra	44	(9)	[3-25]
Salix lutea	78	(14)	[1-38]
GRAMINOIDS			
Agrostis stolonifera	78	(8)	[1-36]
Elymus glaucus	67	(9)	[1-27]
Poa pratensis	78	(10)	[1-21]
FORBS			
Actaea rubra	67	(5)	[1-20]
Smilacina stellata	89	(5)	[1-10]
FERNS & ALLIES			
Equisetum arvense	67	(22)	[1-95]

PAG 3FC(ST)3

Sample Size = 5

Forest Class Zone 3, warm and wet environments -- Closed forest with tall shrub undergrowth, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : ACENEG/CORSTO(112.); ALNRHO/PHILEW (26); POPANG/ACEGRA (112); POPTRE/SALSCO (97); POPBAL/CRADOU (26).

Acer negundo, *Alnus rhombifolia*, *Populus angustifolia*, *P. tremuloides*, and/or *P. balsamifera* dominate the overstory canopy. *Alnus incana*, **Cornus stolonifera**, *Crataegus douglasii*, *Philadelphus lewisii*, *Salix lutea*, and/or *S. scouleriana* dominate the undergrowth. The herbaceous layer includes *Elymus glaucus*, *Poa pratensis*, and/or *Galium triflorum*.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
Acer negundo	40	(36)	[10-62]
<i>Alnus rhombifolia</i>	20	(95)	195-951
<i>Populus angustifolia</i>	40	(33)	[1-64]
<i>Populus balsamifera</i>	20	(57)	[57-57]
<i>Populus tremuloides</i>	40	(32)	[3-61]
SHRUBS			
Acer grandidentatum	60	(8)	[1-17]
<i>Alnus incana</i>	60	(21)	[10-40]
Cornus stolonifera	40	(37)	[5-69]
<i>Crataegus douglasii</i>	20	(25)	[25-25]
<i>Pachistima myrsinites</i>	60	(13)	[4-26]
<i>Philadelphus lewisii</i>	40	(60)	[30-90]
<i>Salix lutea</i>	20	(40)	[40-40]
<i>Salix scouleriana</i>	20	(24)	[24-24]
GRAMINOIDS			
<i>Elymus glaucus</i>	80	(11)	[10-12]
<i>Poa pratensis</i>	80	(19)	[5-38]
FORBS			
<i>Actaea rubra</i>	60	(4)	[1-5]
<i>Galium triflorum</i>	40	(39)	[3-75]
<i>Heracleum lanatum</i>	60	(5)	[3-8]
<i>Osmorhiza chilensis</i>	60	(5)	[2-10]
<i>Smilacina stellata</i>	80	(7)	[1-11]

PAG 3FC (SM) 3

Sample Size = 8

Forest Class Zone 3, warm and wet environments -- Closed forest with medium shrub undergrowth, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES): PINPON/SYMALB
(23, 26, 73, 75, 84, 114, 128).

Pinus ponderosa dominates the overstory canopy. *Symphoricarpos albus* dominate the undergrowth with *Spiraea betulifolia* and *Berberis repens* also present. The herbaceous layer includes *Calamagrostis rubescens* and *Arnica cordifolia*.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
<i>Pinus ponderosa</i>	100	(44)	[32-56]
SHRUBS			
<i>Berberis repens</i>	88.	(5)	[1-15]
<i>Spiraea betulifolia</i>	63	(17)	[3-39]
<i>Symphoricarpos albus</i>	100	(34)	[18-47]
GRAMINOIDS			
<i>Agropyron spicatum</i>	75	(11)	[3-20]
<i>Calamagrostis rubescens</i>	63	(19)	[9-41]
<i>Carex geyeri</i>	75	(12)	[1-20]
<i>Festuca idahoensis</i>	75	(8)	[1-18]
FORBS			
<i>Achillea millefolium</i>	75	(3)	[1-7]
<i>Arnica cordifolia</i>	63	(7)	[3-18]
<i>Balsamorhiza sagittata</i>	50	(6)	[1-8]
<i>Osmorhiza chilensis</i>	75	(2)	[1-5]

PAG 3FC(HM)1
Sample Size = 1

Forest Class Zone 3, warm and wet environments -- Closed forest
with medium herbaceous undergrowth, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : PICEA/LYSAME (49)..

Picea spp. dominates the overstory canopy. Alnus incana is present
in the undergrowth. The herbaceous layer is dominated by
Lysichiton americanus and includes Athyrium filix-femina,
reflecting wet sites.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
Picea spp.	100	(27)	[27-27]
SHRUBS			
Alnus incana	100	(30)	130-301
FORBS			
Lysichiton americanus	100	(35)	[35-35]
FERNS & ALLIES			
Athyrium filix-femina	100	(5)	[5-5]

PAG 3FC(HM)3

Sample Size = 2

Forest Class Zone 3, warm and wet environments -- Closed forest with medium herbaceous undergrowth, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : POPTRE/OSMOCC (49,901.

Populus tremuloidei dominates the overstory canopy. The herbaceous layer includes Bromus ciliatus, Mertensia ciliata, Osmorhiza occidentalis, and Veratrum californicum.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
Populus tremuloides	100	(60)	[42-78]
GRAMINOIDS			
Bromus ciliatus	100	(11)	[1-20]
Elymus glaucus	100	(6)	[5-7]
Poa pratensis	100	(5)	[1-9]
FORBS			
Ligusticum grayi	50	(20)	[20-20]
Mertensia ciliata	50	(35)	[35-35]
Osmorhiza chilensis	100	(11)	[10-12]
Osmorhiza occidentalis	50	(11)	[11-11]
Veratrum californicum	50	(43)	[43-43]

PAG 3FC (HL) 2

Sample Size = 6

Forest Class Zone 3, warm and wet environments -- Closed forest with low herbaceous undergrowth, moderate soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : **ALNRHO** (26); **POPANG/POAPRA** (49); **POPTRE/CAREX** (97); **POPTRE/POAPRA** (49, 90, 97, 98).

Populus angustifolia, *Alnus rhomifolia*, and/or *Populus tremuloides* dominate the overstory canopy. The herbaceous layer includes *Elymus glaucus*, *Phleum pratense*, *Carex* spp., and *Poa pratensis* indicating moist sites. Various forbs are present with minor cover.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
<i>Alnus rhombifolia</i>	17	(98)	[98-98]
<i>Populus angustifolia</i>	17	(44)	[44-44]
<i>Populus tremuloides</i>	67	(62)	[48-77]
SHRUBS			
<i>Rosa woodsii</i>	83	(8)	[1-15]
GRAMINOIDS			
<i>Carex hoodii</i>	33	(7)	[3-10]
<i>Carex rossii</i>	17	(13)	[13-13]
<i>Elymus glaucus</i>	67	(16)	[1-42]
<i>Phleum pratense</i>	67	(12)	[2-22]
<i>Poa pratensis</i>	83	(25)	[6-49]

Forest Class Zone 3, warm and wet environments -- Open forest with tall shrub undergrowth, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : JUNSCO/CORSTO (49);
PINPON/CORSTO (49) ; PSEMEN/CORSTO (49).

The open canopy is dominated by *Juniperus scopulorum*, **Pinus ponderosa**, *Populus angustifolia* and/or *P. balsamifera*. **Cornus stolonifera**, *Prunus virginiana*, and/or *Rosa woodsii* dominate the understory. The herbaceous layer includes *Agrostis stolonifera*, *Poa compressa*, *P. pratensis*, *Smilacina stellata*, and *Equisetum arvense* indicating wet sites.

MOST FREQUENTLY OCCURRING SPECIES:

	CONSTANCY	AVG. COVER	RANGE
TREES			
<i>Juniper-us scopulorum</i>	67	(35)	[9-60]
Pinus ponderosa	33	(22)	[22-22]
<i>Populus angustifolia</i>	100	(53)	[47-60]
<i>Populus balsamifera</i>	100	(30)	[10-43]
<i>Pseudotsuga menziesii</i>	67	(11)	[1-21]
SHRUBS			
Cornus stolonifera	100	(16)	[13-21]
<i>Prunus virginiana</i>	100	(9)	[1-16]
<i>Rosa woodsii</i>	100	(13)	[12-15]
<i>Salix bebbiana</i>	67	(7)	[4-10]
GRAMINOIDS			
<i>Agropyron repens</i>	67	(6)	[3-8]
<i>Agrostis stolonifera</i>	67	(17)	[9-25]
<i>Phleum pratense</i>	67	(9)	[4-14]
<i>Poa compressa</i>	67	(8)	[1-15]
<i>Poa pratensis</i>	100	(13)	[9-20]
FORBS			
<i>Apocynum androsaemifolium</i>	67	(21)	[1-40]
<i>Melilotis alba</i>	67	(11)	[10-12]
<i>Smilacina stellata</i>	100	(6)	[2-12]
FERNS & ALLIES			
<i>Equisetum arvense</i>	100	(14)	[1-22]

PAG 3FO (ST) 3

Sample Size = 3

Forest Class Zone 3, warm and wet environments -- Open forest with tall shrub undergrowth, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : PINPON-QUEGAR/SYMALB (136); PINPON/CRADOU (26).

Pinus ponderosa and/or **Quercus garryana** dominate the open canopy. **Crataegus douglasii**, **Berberis repens**, and/or **Symphoricarpos albus** dominate the understory. The herbaceous layer includes **Poa pratensis** and **Galium triflorum**.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
Pinus ponderosa	100	(22)	[4-32]
Quercus garryana	33	(12)	[12-12]
SHRUBS			
Berberis repens	67	(17)	[1-32]
Crataegus douglasii	67	(27)	[13-40]
Symphoricarpos albus	67	(6)	[1-11]
GRAMINOIDS			
Poa pratensis	67	(38)	[5-70]
FORBS			
Galium triflorum	67	(6)	[5-6]

PAG 3FD (SM) 3

Sample Size = 11

Forest Class Zone 3, warm and wet environments -- Open forest with medium shrub undergrowth, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : POPTRE/AMEALN-SYMORE/TALL FORB (97); POPTRE/AMEALN-SYMORE/THAFEN (97,98); POPTRE/AMEALN/TALL FORB (97,98,99); POPTRE/AMEALN/THAFEN (97,98); POPTRE/SYMALB (26,84,143) .

Populus tremuloides dominates the open canopy. Amelanchier alnifolia, Prunus virginiana, Symphoricarpos **albus**, and/or S. oreophilus dominate the understory. The herbaceous layer includes Calamagrostis rubescens, Carex geyeri, Osmorhiza chilensis, Smilacina stellata and/or Thalictrum fendleri.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
Populus tremuloides	100	(74)	[55-95]
SHRUBS			
Amelanchier alnifolia	73	(15)	[7-24]
Physocarpus malvaceus	64	(12)	[1-28]
Prunus virginiana	73	(18)	[2-35]
Salix scouleriana	73	(2)	[1-5]
Symphoricarpos albus	91	(24)	[4-60]
Symphoricarpos oreophilus	64	(13)	[1-27]
GRAMINOIDS			
Calamagrostis rubescens	64	(17)	[1-34]
Carex geyeri	73	(13)	[2-35]
Elymus glaucus	82	(9)	[1-16]
FORBS			
Achillea millefolium	91	(2)	[1-12]
Arnica cordifolia	64	(7)	[3-12]
Epilobium angustifolium	73	(3)	[1-8]
Galium boreale	73	(4)	[1-18]
Geranium viscosissimum	73	(6)	[2-9]
Osmorhiza chilensis	82	(7)	[1-14]
Osmorhiza occidentalis	64	(4)	[1-11]
Smilacina stellata	82	(3)	[1-6]
Thalictrum fendleri	73	(12)	[7-18]

PAG 3ST(ST) 1

Sample Size 3 1

Shrubland Class Zone 3, warm and wet environments -- Treed shrubland with tall shrubs, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : **BETOCC/POPBAL/SALIX** (90).

Populus angustifolia and P. balsamifera are present in the tree layer. Betula occidentalis dominate the shrub layer. The herbaceous layer includes Bromus carinatus, Osmorhiza chilensis, and Smilacina stellata indicating wet sites.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
Populus angustifolia	100	(52)	[52-52]
Populus balsamifera	100	(30)	[30-30]
SHRUBS			
Betula occidentalis	100	(64)	[64-64]
Rosa woodsii	100	(9)	[9-9]
GRAMINOIDS			
Bromus carinatus	100	(8)	[8-8]
Poa pratensis	100	(7)	[7-7]
FORBS			
Osmorhiza chilensis	100	(10)	[10-10]
Smilacina stellata	100	(6)	[6]

Sample Size = 78

Shrubland Class Zone 3, warm and wet environments -- Shrubland with tall shrubs, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES): ALNINC (49,84,85,90,112); ALNINC/CORSTO (26,112); ALNINC/MESIC FORB (90,112); ALNINC/MESIC GRAMINOID (26,90,112); ALNINC/RIBHUD (151); BETOCC (49,90,112); BETOCC/CORSTO (90,112); BETOCC/MESIC FORB (90,112); CORSTO (49,85,90,151); CORSTO/GALTRI (112); CRADOU (26); SALBEB (49,112); SALBOO-SALGEY (84,901); SALBOO-SALGEY-SALLEM/CARLAN (84); SALBOO-SALLEM (84); SALBOO/CALCAN (112,151); SALBOO/CARAQU (112,151); SALBOO/CARNEB (90); SALBOO/CARUTR (84,112,151); SALBOO/EQUARV (151); SALBOO/SMISTE (151); SALBOO/MESIC FORB (90,112,151); SALBOO/MESIC GRAMINOID (90,112); SALDRU (49,901); SALEXI-SALLAS (90); SALEXI/BARREN (90,112); SALEXI/MESIC FORB (90,112,151); SALEXI/MESIC GRAMINOID (112,151); SALGEY-SALLEM (84); SALGEY/CALCAN (49); SALGEY/CARUTR (49,84,90,112,151); SALLEM/MESIC FORB (90); SALLEM/MESIC GRAMINOID (90); SALLAS (49,90); SALLUT/CALCAN (49); SALLUT/CARUTR (49,90).

Alnus incana, *Betula occidentalis*, *Cornus stolonifera*, *Salix boothii*, *S. exigua*, *S. geyeriana*, *S. lasiandra*, and/or *S. lutea* dominate the overstory. The herbaceous layer includes *Agrostis stolonifera*, *Calamagrostis canadensis*, *Carex* spp., *Aster* spp., and/or *Galium trifolium* reflecting wet sites. *Equisetum* species are present with varying cover.

MOST FREQUENTLY OCCURRING SPECIES:

SHRUBS	CONSTANCY	AVG. COVER	RANGE
<i>Alnus incana</i>	50	(31)	[1-90]
<i>Betula occidentalis</i>	22	(38)	[1-87]
<i>Cornus stolonifera</i>	58	(22)	[1-92]
<i>Crataegus douglasii</i>	8	(31)	[1-85]
<i>Lonicera involucrata</i>	46	(9)	[1-50]
<i>Ribes inerme</i>	54	(10)	[1-40]
<i>Salix bebbiana</i>	17	(18)	[2-79]
<i>Salix boothii</i>	58	(29)	[1-72]
<i>Salix drummondii</i>	39	(26)	[1-96]
<i>Salix exigua</i>	44	(21)	[1-85]
<i>Salix geyeriana</i>	40	(25)	[1-70]
<i>Salix lasiandra</i>	45	(25)	[1-89]
<i>Salix lemmonii</i>	12	(35)	[3-88]
<i>Salix lutea</i>	49	(20)	[1-86]
GRAMINOIDS			
<i>Agrostis stolonifera</i>	62	(13)	[1-80]
<i>Calamagrostis canadensis</i>	49	(11)	[1-59]
<i>Carex aquatilis</i>	39	(13)	[1-70]
<i>Carex lanuginosa</i>	54	(8)	[1-43]
<i>Carex microptera</i>	54	(4)	[1-28]

Carex nebrascensis	31	(10)	[1-50]
Carex utriculata	53	(19)	[1-80]
Deschampsia cespitosa	51	(5)	[1-25]
Poa pratensis	81	(11)	[1-50]

FORBS

Aconitum columbianum	50	(5)	[1-20]
Aster eatonii	13	(10)	[1-24]
Aster ssp.	37	(3)	[1-15]
Aster foliaceus	26	(4)	[1-12]
Aster modestus	13	(7)	[1-17]
Aster occidentalis	24	(3)	[1-10]
Caltha leptosepala	4	(32)	[1-90]
Galium triflorum	65	(3)	[1-40]
Geranium richardsonii	39	(5)	[1-20]
Heracleum lanatum	47	(8)	[1-33]
Mertensia ciliata	41	(7)	[1-50]
Smilacina stellata	72	(6)	[1-40]
Thalictrum fendleri	47	(5)	[1-32]
Urtica dioica	45	(5)	[1-24]

FERNS & ALLIES

Equisetum arvense	69	(9)	[1-85]
Equisetum hyemale	18	(4)	[1-18]
Equisetum ssp.	8	(8)	[1-17]
Equisetum laevigatum	12	(3)	[1-8]

Shrubland Class Zone 3, warm and wet environments -- Shrubland with tall shrubs, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES): ALNINC/SYMALB (84); ALNSIN (49); BETOCC/POAPRA (90,112); SALBOO/POAPRA (90,112,151); SALEXI (49,901); SALEXI/EQUARV (151); SALEXI/POAPRA (112,151); SALLAI/BARREN (90,112); SALLAI/ROSWOO/GRASS-FORB (90); SALLUT/POAPRA (90).

Alnus incana, *Salix boothii*, *S. Exigua*, *S. lasiolepis*, and/or *S. lutea* dominate the overstory. *Ribes aureum* and *Rosa woodsii* are also present. The herbaceous layer includes *Agrostis stolonifera*, *Juncus balticus*, *Poa pratensis*, *Smilacina stellata*, *Urtica dioica*, and/or *Equisetum arvense*.

MOST FREQUENTLY OCCURRING SPECIES:

SHRUBS	CONSTANCY	AVG. COVER	RANGE
<i>Alnus incana</i>	44	(13)	[1-56]
<i>Alnus sinuata</i>	6	(80)	[80-80]
<i>Betula occidentalis</i>	13	(73)	[73-73]
<i>Ribes aureum</i>	56	(9)	[1-30]
<i>Ribes inerme</i>	44	(5)	[1-11]
<i>Rosa woodsii</i>	63	(6)	[1-29]
<i>Salix boothii</i>	56	(26)	[2-56]
<i>Salix drummondii</i>	44	(13)	[1-51]
<i>Salix exigua</i>	63	(35)	[1-85]
<i>Salix lasiolepis</i>	25	(54)	[15-88]
<i>Salix lutea</i>	56	(25)	[1-85]
GRAMINOIDS			
<i>Agrostis stolonifera</i>	63	(11)	[1-28]
<i>Carex microptera</i>	56	(5)	[1-21]
<i>Deschampsia cespitosa</i>	38	(3)	[1-10]
<i>Elymus glaucus</i>	44	(3)	[1-5]
<i>Juncus balticus</i>	63	(6)	[1-13]
<i>Poa palustris</i>	44	(5)	[1-10]
<i>Poa pratensis</i>	81	(22)	[2-47]
FORBS			
<i>Aster spp.</i>	50	(7)	[1-15]
<i>Fragaria virginiana</i>	38	(8)	[1-28]
<i>Geum macrophyllum</i>	63	(3)	[1-8]
<i>Potamogeton gramineus</i>	38	(6)	[1-15]
<i>Smilacina stellata</i>	69	(3)	[1-10]
<i>Urtica dioica</i>	56	(5)	[1-23]
FERNS & ALLIES			
<i>Equisetum arvense</i>	69	(5)	[1-26]

PAG 3S (SM) 1

Sample Size = 2

Shrubland Class Zone 3, warm and wet environments -- Shrubland with medium shrubs, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : SPIDOU (49,851.

Spiraea douglasii dominate the overstory. Rhamnus alnifolia, Rosa acicularis, and/or Symphoricarpos **albus** are also present. The herbaceous layer includes Calamagrostis canadensis, Carex utriculata, Heracleum lanatum, and/or Potentilla palustris reflecting wet sites.

MOST FREQUENTLY OCCURRING SPECIES:

SHRUBS	CONSTANCY	AVG. COVER	RANGE
Rhamnus alnifolia	50	(20)	[20-20]
Rosa acicularis	50	(20)	[20-20]
Rubus idaeus	100	(5)	[3-7]
Spiraea douglasii	100	(84)	[79-88]
Symphoricarpos albus	50	(21)	[21-21]
GRAMINOIDS			
Calamagrostis canadensis	100	(23)	[5-40]
Carex utriculata	50	(60)	[60-60]
FORBS			
Heracleum lanatum	100	(7)	[3-10]
Potentilla palustris	50	(40)	[40-40]

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PAG 3S(SM) 2

Sample Size = 3

Shrubland Class Zone 3, **warm** and wet environments -- Shrubland with medium shrubs, moderate soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : ARTTSV/POAFEN (26); ROSWOO (49,90).

Artemisia tridentata and/or **Rosa woodsii** dominate the overstory. **Ribes aureum** and/or **Symphoricarpos occidentalis** are also present. The herbaceous layer includes **Carex praegracilis**, **Elymus cinereus**, **Juncus balticus**, **Poa fendleriana**, **Aster hesperius** and/or **Smilacina stellata** indicating moist sites.

MOST FREQUENTLY OCCURRING SPECIES:

SHRUBS	CONSTANCY	AVG. COVER	RANGE
Artemisia tridentata			
ssp. vaseyana	67	(36)	[4-67]
Ribes aureum	67	(5)	[4-6]
Rosa woodsii	67	(55)	[28-81]
Symphoricarpos occidentalis	33	(25)	[25-251]
GRAMINOIDS			
Agrostis stolonifera	67	(15)	[5-25]
Carex praegracilis	100	(8)	[2-20]
Elymus cinereus	100	(17)	[8-24]
Juncus balticus	100	(5)	[2-12]
Poa fendleriana	33	(44)	[44-44]
FORBS			
Aster hesperius	33	(40)	[40-40]
Geranium ssp.	33	(20)	[20-20]
Geranium richardsonii	33	(10)	[10-10]
Humulus lupulus	67	(23)	[5-40]
Sidalcea oregana	67	(4)	[1-6]
Smilacina stellata	67	(6)	[1-11]

PAG 3S (SM) 3

Sample Size = 8

Shrubland Class Zone 3, warm and wet environments -- Shrubland with medium shrubs, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES): POTFRU/DESCES
(26,49,112,151); SARVER/MESIC GRAMINOID (49,100); SYMOCC (49).

Artemisia **cana**, Potentilla fruticosa, Sarcobatus vermiculatus, and/or Symphoricarpos occidentalis dominate the overstory. The herbaceous layer includes Agropyron smithii, Carex spp., Deschampsia cespitosa, Juncus balticus, Poa pratensis, Fragaria virginiana, and/or Polygonum bistortoides.

MOST FREQUENTLY OCCURRING SPECIES:

SHRUBS	CONSTANCY	AVG. COVER	RANGE
Artemisia cana	38	(31)	[3-80]
Potentilla fruticosa	50	(32)	[25-48]
Sarcobatus vermiculatus	38	(19)	[3-38]
Symphoricarpos occidentalis	13	(66)	[66-66]
GRAMINOIDS			
Agropyron smithii	38	(39)	[15-55]
Carex lanuginosa	25	(23)	[5-40]
Carex nebrascensis	25	(35)	[4-65]
Carex praegracilis	25	(17)	[3-30]
Deschampsia cespitosa	50	(28)	[15-40]
Distichlis stricta	13	(22)	[22-22]
Juncus balticus	38	(13)	[7-18]
Poa pratensis	88	(16)	[1-29]
FORBS			
Aster ssp.	38	(6)	[3-10]
Aster foliaceus	25	(8)	[3-12]
Fragaria virginiana	38	(14)	[1-23]
Polygonum bistortoides	38	(14)	[3-35]

PAG 3S (SL) 1

Sample Size = 6

Shrubland Class Zone 3, warm and wet environments -- Shrubland with low shrubs, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : ARTCAN-ARTTRI/POAFEN (84);
ARTCAN/CARNEB-POAFEN (90); ARTCAN/(ELYCAN)-POAFEN (49,112,151).

Artemisia **cana** dominates the overstory. The herbaceous layer includes Carex spp., Juncus balticus, Poa fendleriana, Iris missouriensis, and/or Potamogeton gramineus indicating wet sites.

MOST FREQUENTLY OCCURRING SPECIES:

SHRUBS	CONSTANCY	AVG. COVER	RANGE
Artemisia cana	100	(28)	[2-54]
Artemisia tridentata	33	(7)	[1-13]
GRAMINOIDS			
Agropyron smithii	17	(85)	[85-85]
Carex lanuginosa	33	(26)	[1-50]
Carex microptera	50	(3)	[1-7]
Juncus balticus	67	(15)	[1-43]
Poa fendleriana	33	(13)	[8-17]
Poa pratensis	83	(14)	[1-48]
FORBS			
Helenium hoopesii	33	(18)	[10-26]
Iris missouriensis	17	(25)	[25-25]
Potamogeton gramineus	67	(4)	[2-8]
Taraxacum officinale	67	(9)	[1-23]

PAG 3S (SL) 3

Sample Size = 2

Shrubland Class Zone 3, warm and wet environments -- Shrubland with low shrubs, low soil moisture:

Pm ASSOCIATIONS (REFERENCE CODES) : ARTCAN/DRY GRAMINOID (90,112)'.

Artemisia **cana** dominates the overstory. The herbaceous layer includes Carex douglasii, Festuca idahoensis, Juncus balticus, and/or Poa pratensis.

MOST FREQUENTLY OCCURRING SPECIES:

SHRUBS	CONSTANCY	AVG. COVER	RANGE
Artemisia cana	100	(45)	[43-46]
Rosa. woodsii	50	(10)	[10-10]
GRAMINOIDS			
Carex douglasii	50	(22)	[22-22]
Festuca idahoensis	50	(25)	[25-25]
Juncus balticus	100	(6)	[1-10]
Poa pratensis	100	(38)	[2-73]
FORBS			
HELHOP	50	(25)	[25-25]
Iris missouriensis	50	(17)	[17-17]
Wyethia amplexicaulis	50	(28)	[28-28]

PAG 3H(HT)1

Sample Size = 5

Herbland Class Zone 3, warm and wet environments -- **Herbland** with tall herbs, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : **PHAARU (49)**; **PHRAUS (49)**; **SCIACU (49)**; **TYPLAT (49,851)**.

Phalaris arundinacea, Phragmites australis, Scirpus acutus, S. **validus**, and/or **Typha** latifolia dominate the herbaceous layer. Other species include Equisetum spp., Lemna minor, Hordeum jubatum, Mentha arvensis, and/or Polygonum amphibium reflecting warm, wet sites.

MOST FREQUENTLY OCCURRING SPECIES:

GRAMINOIDS	CONSTANCY	AVG. COVER	RANGE
Hordeum jubatum	80	(22)	[20-27]
Phalaris arundinacea	40	(48)	[15-80]
Phragmites australis	20	(80)	[80-80]
Scirpus acutus	80	(20)	[1-65]
Scirpus valdus	40	(52)	[31-73]
FORBS			
Lemna minor	60	(18)	[1-44]
Mentha arvensis	80	(7)	[1-15]
Polygonum amphibium	60	(15)	[10-18]
Typha latifolia	60	(51)	[1-83]
FERNS & ALLIES			
Equisetum arvense	20	(10)	[10-10]
Equisetum fluviatile	60	(6)	[4-7]

PAG 3H(HT) 2

Sample Size = 1

Herbland Class Zone 3, warm and wet environments -- **Herbland** with tall herbs, moderate soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : SPAPEC (49). .

Spartina pectinata, *S. gracilis*, *Carex praegracilis*, and/or *Scirpus pungens* dominate the herbaceous layer. Other species reflecting warm, moist sites include *Scirpus acutus*.

MOST FREQUENTLY OCCURRING SPECIES:

	CONSTANCY	AVG. COVER	RANGE
GRAMINOIDS			
<i>Carex praegracilis</i>	100	(80)	[80-80]
<i>Scirpus acutus</i>	100	(20)	[20-20]
<i>Scirpus pungens</i>	100	(70)	[70-70]
<i>Spartina gracilis</i>	100	(65)	[65-65]
<i>Spartina pectinata</i>	100	(79)	[79-79]
FORBS			
<i>Helianthus maximiliani</i>	100	(50)	[50-50]

PAG 3E(HT) 3

Sample Size = 1

Herbland Class Zone 3, warm and wet environments -- **Herbland** with tall herbs, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES): ELYCIN (30).

Elymus cinereus dominates the herbaceous layer. *Juncus balticus*, *Poa pratensis*, *P. secunda*, and/or *Puccinellia distans* are also present.

MOST FREQUENTLY OCCURRING SPECIES:

GRAMINOIDS	CONSTANCY	AVG. COVER	RANGE
<i>Elymus cinereus</i>	100	(51)	[51-51]
<i>Juncus balticus</i>	100	(6)	[6-6]
<i>Poa pratensis</i>	100	(10)	[10-10]
<i>Poa secunda</i>	100	(17)	[17-17]
<i>Puccinellia distans</i>	100	(10)	[10-10]
FORBS			
<i>Antennaria microphylla</i>	100	(20)	[20-20]

PAG 3H(HM)1

Sample Size = 8

Herbland Class Zone 3, warm and wet environments -- **Herbland** with medium herbs, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : CARUTR (49,84,90,112,151); GLYBOR (49); SCIMAR (49); **SCIPUN** (49).

Carex utriculata, Glyceria borealis, Scirpus maritimus, and/or S. pungens dominate the herbaceous layer. Graminoids indicating warm, wet sites include Carex aquatilis, C. nebrascensis, Eleocharis palustris, and/or Juncus balticus. Aster spp., Equisetum spp., Geum macrophyllum, and/or Potamogeton gramineus are present with minor cover.

MOST FREQUENTLY OCCURRING SPECIES:

GRAMINOIDS	CONSTANCY	AVG. COVER	FLANGE
Carex aquatilis	75	(5)	[2-16]
Carex nebrascensis	75	(8)	[1-20]
Carex utriculata	88	(56)	[1-90]
Eleocharis palustris	75	(15)	[1-37]
Glyceria borealis	13	(48)	[48-48]
Juncus balticus	63	(5)	[2-13]
Poa pratensis	63	(9)	[1-20]
Scirpus maritimus	25	(43)	[1-85]
Scirpus pungens	25	(66)	[60-71]
FORBS			
Aster ssp.	25	(4)	[1-6]
Geum macrophyllum	50	(3)	[1-9]
Potamogeton gramineus	50	(3)	[1-7]
Typha latifolia	25	(17)	[2-32]
FERNS & ALLIES			
Equisetum arvense	50	(7)	[1-14]
Equisetum fluviatile	13	(19)	[19-19]

PAG 3H(HM) 3

Sample Size = 10

Herbland Class Zone 3, warm and wet environments -- **Herbland** with medium herbs, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : DESCES
(49, 84, 85, 90, 112, 151); DESCES-CAREX (84, 90, 100); POAPAL (49).

Deschampsia cespitosa and/or Poa palustris dominate the herbaceous layer. Carex athrostachya, C. microptera, C. nebrascensis, Juncus balticus, and/or Polygonum bistortoides are also present.

MOST FREQUENTLY OCCURRING SPECIES:

GRAMINOIDS	CONSTANCY	AVG. COVER	RANGE
Carex athrostachya	60	(17)	[1-35]
Carex microptera	40	(8)	[3-18]
Carex nebrascensis	40	(17)	[2-46]
Deschampsia cespitosa	100	(40)	[3-57]
Juncus balticus	70	(8)	[1-22]
Poa palustris	20	(27)	[1-53]
Poa pratensis	70	(7)	[1-20]
FORES			
Polygonum bistortoides	60	(3)	[1-10]

PAG 3H(HL) 1

Sample Size = 16

Herbland Class Zone 3, warm and wet environments -- **Herbland** with low herbs, high soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : **CARLAN** (26, 84, 90, 112); **CARSIM** (49, 84, 90, 151); **ELEPAL** (49, 84, 90, 112); **ELEPAU** (49, 84, 90); **EQUFLU** (49).

Carex lanuginosa, C. simulata, Eleocharis palustris, E. pauciflora, and/or Equisetum fluviatile dominate the herbaceous layer. Species present indicating warm, wet sites include Carex aquatilis, C. nebrascensis, C. utriculata, Deschampsia cespitosa, and/or Juncus balticus.

MOST FREQUENTLY OCCURRING SPECIES:

GRAMINOIDS	CONSTANCY	AVG. COVER	RANGE
Carex aquatilis	69	(9)	[1-25]
Carex lanuginosa	38	(34)	[1-82]
Carex nebrascensis	63	(8)	[1-20]
Carex simulata	50	(34)	[1-78]
Carex utriculata	7 5	(6)	[1-23]
Deschampsia cespitosa	75	(3)	[1-5]
Eleocharis palustris	63	(30)	[1-85]
Eleocharis pauciflora	38	(27)	[4-61]
Juncus balticus	69	(7)	[1-24]
Poa pratensis	63	(6)	[1-26]
FERNS & ALLIES			
Equisetum fluviatile	6	(71)	[71-71]

PAG 3H(HL) 2

Sample Size = 9

Herbland Class Zone 3, warm and wet environments -- **Herbland** with low herbs, moderate soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : CARNEB (49,84,90,112,151); JUNBAL (49,90,112,151).

Carex nebrascensis and/or Juncus **balticus** dominate the herbaceous layer. Species indicating warm, moist sites include Agrostis stolonifera, Carex praegracilis, C. simulata, and/or Equisetum arvense. Aster occidentalis, Geum macrophyllum, and/or Mentha arvensis are present with minor cover.

MOST FREQUENTLY OCCURRING SPECIES:

GRAMINOIDS	CONSTANCY	AVG. COVER	RANGE
Agrostis stolonifera	67	(14)	[1-23]
Carex nebrascensis,	78	(46)	[4-84]
Carex praegracilis	89	(8)	[1-25]
Carex simulata	67	(10)	[3-35]
Juncus balticus	89	(42)	[9-84]
FORBS			
Aster occidentalis	56	(3)	[1-10]
Geum macrophyllum	67	(4)	[1-10]
Mentha arvensis	44	(16)	[4-40]
Senecio hydrophilus	33	(26)	[2-40]
FERNS & ALLIES			
Equisetum arvense	67	(20)	[1-65]

PAG 3H(HL) 3

Sample Size = 9

Herbland Class Zone 3, warm and wet environments -- **Herbland** with low herbs, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : **CARDOU (90); CARMIC (112,151); POAFEN (84); POASEC (90); POAPRA (49,84,90,112).**

Carex douglasii, *C. microptera*, *Poa fendleriana*, *P. secunda*, and/or *P. pratensis* dominate the herbaceous layer. **Achillea millefolium**, **Aster occidentalis**, and/or **Juncus balticus** are present with minor cover.

MOST FREQUENTLY OCCURRING SPECIES:

GRAMINOIDS	CONSTANCY	AVG. COVER	RANGE
<i>Carex douglasii</i>	22	(35)	[2-68]
<i>Carex microptera</i>	44	(34)	[1-83]
<i>Carex nebrascensis</i>	78	(3)	[1-10]
Juncus balticus	100	(7)	[1-30]
<i>Poa fendleriana</i>	44	(11)	[1-38]
<i>Poa pratensis</i>	89	(41)	[10-77]
<i>Poa secunda</i>	33	(18)	[2-46]
FORBS			
Achillea millefolium	67	(8)	[2-28]
Aster occidentalis	56	(7)	[1-30]

PAG 4FC(HL) 3

Sample Size = 4

Forest **Class** Zone 4, hot and dry environments -- Closed forest with low herbaceous understory, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : POPTRE/POAPRA (49,90,97,99).

Populus tremuloides dominates the **overstory**. Abies **concolor** is also present. Poa pratensis dominates the herbaceous layer indicating disturbance. Agropyron caninum, Elymus glaucus, **Lathyrus spp.**, Lupinus argenteus, and/or **Taraxacum officinale** are also present.

MOST FREQUENTLY OCCURRING SPECIES:

TREES	CONSTANCY	AVG. COVER	RANGE
Abies concolor	75	(3)	[1-5]
Populus tremuloides	100	(61)	[48-74]
SHRUBS			
Prunus virginiana	75	(2)	[1-5]
Rosa woodsii	100	(7)	[2-15]
GRAMINOIDS			
Agropyron caninum	75	(8)	[3-15]
Agrostis stolonifera	50	(16)	[15-16]
Elymus glaucus	75	(16)	[2-42]
Poa pratensis	100	(30)	[22-37]
FORBS			
Lathyrus lanszwertii	50	(14)	[4-23]
Lupinus argenteus	75	(8)	[5-15]
Taraxacum officinale	100	(7)	[4-10]

PAG 4H(HT) 3

Sample Size = 2

Herbland Class Zone 4, hot and dry environments -- **Herbland** with tall herbs, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : ELYCIN (74,107).

Elymus cinereus dominates the herbaceous layer. *Bromus tectorum*, *Stipa* spp., ***Cardaria*** spp., *Galium aparine*, *Geranium* spp., and/or *Ivesia baileyi* are also present.

MOST FREQUENTLY OCCURRING SPECIES:

GRAMINOIDS	CONSTANCY	AVG. COVER	RANGE
<i>Bromus tectorum</i>	100	(17)	[3-30]
<i>Elymus cinereus</i>	100	(59)	[40-78]
<i>Stipa</i> spp.	50	(15)	[15-15]
FORBS			
<i>Cardaria</i> spp.	50	(15)	[15-15]
<i>Galium aparine</i>	50	(16)	[16-16]
<i>Geranium</i> spp.	50	(10)	[10-10]
<i>Ivesia baileyi</i>	50	(10)	[10-10]
<i>Montia perfoliata</i>	50	(6)	[6-6]

Sample Size = 6

Herbland Class Zone 4, hot and dry environments -- **Herbland** with low herbs, low soil moisture:

PLANT ASSOCIATIONS (REFERENCE CODES) : CARDOU (90); DISSPI (49); JUNBAL (49,90,112,151).

Carex douglasii, Distichlis spicata, and/or Juncus **balticus** dominate the herbaceous layer. Other species include Aster spp., Carex praegracilis, Geum macrophyllum, Mentha arvensis, Poa pratensis, P. secunda **and/or** Taraxacum officinale.

MOST FREQUENTLY OCCURRING SPECIES:

	CONSTANCY	AVG. COVER	RANGE
GRAMINOIDS			
Carex douglasii	50	(24)	[1-68]
Carex praegracilis	6 7	(14)	[2-25]
Distichlis spicata	1 7	(57)	[57-57]
Juncus balticus	83	(57)	[1-84]
Poa pratensis	67	(13)	[1-23]
Poa secunda	50	(7)	[6-10]
FORBS			
Aster spp.	50	(4)	[1-8]
Aster occidentalis	33	(6)	[2-10]
Geum macrophyllum	33	(4)	[2-5]
Mentha arvensis	33	(7)	[4-10]
Solidago iccidentalis	17	(50)	[50-501]
Taraxacum officinale	50	(16)	[2-38]

III. Mapping

III.A. Purpose

The riparian PAG classification is linked spatially to upland potential vegetation (PVT) environments, based on input from riparian ecologists within the ICB who participated in a workshop in January, 1995. Since the upland PVT map had already been developed in GIS, dominant (and codominant) valley bottom types and associated dominant (and codominant) riparian **PAG's** were associated to the existing upland PVT settings, based on the participants' knowledge of riparian communities and valley bottom types in their area. For example, within a cold, wet forested environment, the dominant riparian type could include PAG **1FC(HT)1** (e.g., *Abies lasiocarpa*/*Calamagrostis canadensis* plant association), the codominant types would include PAG **1S(SL)1** (e.g., *Salix wolfii*/*Carex aquatilis* plant association) and PAG **1H(HL)1** (e.g., *Carex scopulorum* plant association). They are also associated to valley bottoms which typically occur in these environments. For example, in cold, wet forested environments, cirque basins and **headwall** streams are common, so the dominant valley bottom is flat and moderately wide; the codominant is steep and narrow.

III.B. Methods

Valley bottom types were devised for the Columbia River Basin based upon two criteria, 1) Valley Bottom Width, and 2) Valley Bottom Slope. Each variable was divided into a three class gradient and assigned a numerical code as follows:

Valley Bottom Width	Valley Bottom Slope
1 = Narrow <50'	1 = Steep >6%
2 = Moderate Width 50-200'	2 = Moderate Slope 2-6%
3 = Wide >200'	3 = Flat 0-2%

The resulting nine cell matrix may be seen in Figure 2. Based upon the 48 upland regional PVT classes, a matrix was created for each class. Dominant (D) and codominant (C) valley bottom types were identified. Within each dominant and codominant valley bottom **type**, the dominant (D), codominant (C), and inclusion (I) plant association groups (from Table 2) were also identified. The results of this are found in Table 3.

Figure 2 VALLEY BOTTOM TYPE MATRIX

To be developed.

III.C. Valley Bottom Descriptions

The following brief descriptions summarize the dominant and codominant valley bottom types (Table 3) with the corresponding dominant and codominant **PAG's** (Table 2) nested within them for each of the 48 upland regional PVT. classes. This information will be used to characterize the riparian component of the upland types,

since riparian environments are not mapped at this coarse scale.

Upland Regional Class: Forest 1,1

This environment represents the coldest and wettest forested subalpine sites in the Columbia River Basin (ICB). Prevailing winds create a precipitation pattern which decreases from west to east, with heavy snow loads. It does not occur in the Lahontan and Northwestern Basin and Range Sections.

VALLEY BOTTOM TYPES

DOMINANT: (2,3) Moderate Width, Flat
CODOMINANT1: (1,1) Narrow, Steep
CODOMINANT2: (3,3) Wide, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, flat **cirque** basin valley bottoms are dominated by wet Salix eastwoodiae, S. farriar, S. olanifolia, and/or Betula glandulosa shrub types [1S(SM)1]. A complex of low, wet Carex spp. types [1H(HL)1] codominate with various tall willow (Salix boothii, S. drummondiana, S. geeyeriana) types [1S(ST)1]. Open Abies lasiocarpa forests [1FO(SM)2] are present as inclusions.

DOMINANT PAG: 1S(SM)1
CODOMINANT PAG: 1H(HL)1
CODOMINANT PAG: 1S(ST)1
INCLUSION PAG: 1FO(SM)2

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley Bottom1: The narrow, steep valley bottoms are dominated by open Abies lasiocarpa/Vaccinium scooarium communities [1FO(SM)2]. Closed Abies spp. or Tsusa heterophylla forests with Achlys triphylla, or Picea spp./Equisetum arvense types [1FC(HL)2] and wet Salix spp. and/or Alnus incana shrub types [1S(ST)1] are also common. Closed Abies grandis/Senecio trianoularis, A. lasiocarpa/Calamagrostiscanadensis, and/or Picea engelmannii/C. canadensis may be present as inclusions [1FC(HT)1].

DOMINANT PAG: 1FO(SM)2
CODOMINANT PAG: 1FC(HL)2
CODOMINANT PAG: 1S(ST)1
INCLUSION PAG: 1FC(HT)1

DOMINANT STREAM TYPE: A

Codominant Valley Bottom2: The wide, flat valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: C

CODOMINANT STREAM TYPES: **E,B,D**

Upland Regional Class: Forest **1,2**

This cold, moist environment, which includes the highest portions of the subalpine zone, is as cold as regional class Forest **1,1**, but has less effective precipitation. Snowloads may be locally high. This environment does not occur in the Lahontan and Northwestern Basin and Range Sections.

VALLEY BOTTOM TYPES

DOMINANT: (2,3) Moderate Width, Flat
CODOMINANT1: (1,1) Narrow, Steep
CODOMINANT2: (3,3) Wide, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide; flat cirque basin valley bottoms are dominated by wet Salix eastwoodiae, S. farriae, and/or S. planifolia types [1S (SM) 1]. A complex of low, wet Carex spp. types [1H (HL) 1] and Salix boothii and/or S. severiana types are also present [1S (ST) 1]. Open Abies lasiocarpa forests may be present as inclusions [1FO (SM) 2].

DOMINANT PAG: 1S (SM) 1
CODOMINANT PAG: 1H (HL) 1
CODOMINANT PAG: 1S (ST) 1
INCLUSION PAG: 1FO (SM) 2

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley Bottom1: The narrow, steep valley bottoms are dominated by open Abies lasiocarpa/Vaccinium scoparium communities [1FO (SM) 2]. Closed Abies spp. and/or Tsuga heterophylla forests with Achlys triphylla undergrowth, or Picea spp. with Equisetum arvense in the understory [1FC (HL) 2], and wet Salix spp. and/or Alnus incana shrub types [1S (ST) 1] are also common. Closed Abies grandis/Senecio triangularis, A. lasiocarpa/Calamagrostis canadensis, and/or Picea engelmannii/C. canadensis types may be present as inclusions [1FC (HT) 1].

DOMINANT PAG: 1FO (SM) 2
CODOMINANT PAG: 1FC (HL) 2
CODOMINANT PAG: 1S (ST) 1
INCLUSION PAG: 1FC (HT) 1

DOMINANT STREAM TYPE: A

Codominant Valley Bottom2: The wide, flat valley bottoms are characterized by the same riparian PAG's as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: E, B, D

Upland Regional Class: Forest 1, 3

This cold, dry environment is characteristic of relatively exposed positions from upper slopes to ridgetops of the high'subalpine zone, or dry climatic regimes.

VALLEY BOTTOM TYPES

DOMINANT: (2, 3) Moderate Width, Flat
CODOMINANT1: (1, 1) Narrow, Steep
CODOMINANT2: (3, 3) Wide, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, flat cirque basin valley bottoms are dominated by wet Salix eastwoodiae, S. farriae, and/or S. planifolia types with Carex utriculata and/or C. auuatilis undergrowth [1S(SM)1]. Wet Carex spp. communities [1H(HL)1] and wet Salix spp. and Alnus incana shrub types [1S(ST)1] are common. Open Abies lasiocarpa/Vaccinium scoparium communities are present as inclusions [1FO(SM)2].

DOMINANT PAG: 1S(SM)1
CODOMINANT PAG: 1H(HL)1
CODOMINANT PAG: 1S(ST)1
INCLUSION PAG: 1FO(SM)2

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley Bottom1: The narrow, steep valley bottoms are dominated by open Abies lasiocarpa/Vaccinium scoparium communities [1FO(SM)2]. Closed Abies spp. or Tsuga heterophylla forests with Achlys triphylla undergrowth, or Picea spp. with Equisetum arvense undergrowth [1FC(HL)2]; and wet Salix spp. and/or Alnus incana shrub types [1S(ST)1] are also common. Closed Abies grandis/Senecio triangularis, A. lasiocarpa/Calamagrostis canadensis, and/or Picea engelmannii/C. canadensis are present as inclusions [1FC(HT)1].

DOMINANT PAG: 1FO(SM)2
CODOMINANT PAG: 1FC(HL)2
CODOMINANT PAG: 1S(ST)1
INCLUSION PAG: 1FC(HT)1

DOMINANT STREAM TYPE: A

Codominant Valley Bottom2: The wide, flat valley bottoms are characterized by the same riparian PAG's as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: E,B,D

Upland Regional Class: Forest 1,4

This is the coldest and driest of the forested environments within the ICB. Sites are typically wind-impacted and occupy west to south facing slopes. This does not occur in the Lahontan and Basin and Range Sections.

VALLEY BOTTOM TYPES

DOMINANT: (2,3) Moderate Width, Flat
CODOMINANT1: (1,1) Narrow, Steep
CODOMINANT2: (3,3) Wide, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, flat cirque basin valley bottoms are dominated by wet Salix eastwoodiae, S. farriae, and/or S. Dlanifolia communities [1S(SM)1]. A complex of low Carex spp. types [1H(HL)1] and wet Salix boothii and/or S. severiana types [1S(ST)1] and inclusions of open Abies lasiocarpa forests are also present [1FO(SM)2].

DOMINANT PAG: 1S(SM)1
CODOMINANT PAG: 1H(HL)1
CODOMINANT PAG: 1S(ST)1
INCLUSION PAG: 1FO(SM)2

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B,F,E

Codominant Valley Bottom1: The narrow, steep valley bottoms are dominated by open Abies lasiocarpa/Vaccinium scooarium communities [1FO(SM)2]. Closed Abies spp. or Tsusa heterophylla forests with Achlvs triphylla; and/or Picea spp. with Equisetum arvense undergrowth [1FC(HL)2]; and wet Salix spp. and/or Alnus incana shrub types [1S(ST)1] are also common. Closed Abies grandis/Senecio triangularis, A. lasiocarpa/Calamagrostis canadensis, and Picea engelmannii/C. canadensis may be present as inclusions [1FC(HT)1].

DOMINANT PAG: 1FO(SM)2
CODOMINANT PAG: 1FC(HL)2
CODOMINANT PAG: 1S(ST)1
INCLUSION PAG: 1FC(HT)1

DOMINANT STREAM TYPE: A

Codominant Valley Bottom2: The wide, flat valley bottoms are characterized by the same riparian PAG's as the dominant valley bottom See above description.

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: E, B, D

Upland Regional Class: Forest 2,1

This cool, wet forest environment occupies the subalpine zone, but not the upper elevation sites. Most sites are either riparian, seeps, associated with snowloads, or subirrigated positions such as toeslopes. It is not present in the Lahontan and Basin and Range Sections.

VALLEY BOTTOM TYPES

DOMINANT: (2,2) Moderate Width, Moderate Slope
CODOMINANT1: (2,3) Moderate Width, Flat
CODOMINANT2: (1,1) Narrow, Steep

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, moderately steep valley bottoms are dominated by closed Abies srandis, A. amabilis, Thuja plicata, and/or Tsusa heterophylla forests with low herbaceous understories such as Achlys triphylla; and/or Picea enselmannii forests with Equisetum arvense in the understory [1FC(HL)2]. Tall Salix ssp. shrub types with mesic understories [1S(ST)2], and closed conifer forests with Linnaea borealis and/or Acer circinatum are common [1FC(ST)2]. Closed Abies ssp., Picea ssp., and/or Tsusa ssp. forests with drier site herbaceous undergrowths (e.g., Clintonia uniflora, Gymnocarpium dryopteris, Galium triflorum) are present as inclusions [1FC(HL)3].

DOMINANT PAG: 1FC(HL)2
CODOMINANT PAG: 1S(ST)2
CODOMINANT PAG: 1FC(ST)2
INCLUSION PAG: 1FC(HL)3

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Codominant Valley Bottom1: The moderately wide, flat valley bottoms are dominated by a large and diverse group of tall, wet shrub types. Alnus incana, Betula occidentalis, Cornus stolonifera, Crataegus douglasii; and/or Salix boothii, S. exigua, and/or S. severiana communities are common [3S(ST)1]. Closed forests with drier site shrubs, such as Abies lasiocarpa/Taxus brevifolia communities, [1FC(ST)3] codominate with wet herb types dominated by Scirous ssp., Carex utriculata, and/or Glyceria borealis [3H(HM)1].

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 1FC(ST)3
CODOMINANT PAG: 3H(HM)1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley **Bottom2**: The narrow, steep valley bottoms are characterized by a complex of closed Abies spp. forests with tall shrubs such as Acer circinatum [1FC(ST)2]. Closed Abies grandis, A. lasiocarpa, Picea engelmannii, and/or Tsuga heterophylla forests with drier site forbs (e.g., Clintonia uniflora, Galium triflorum, Gymnocarpium dryopteris) [1FC(HL)3] are codominant with tall shrub types such as Salix boothii and/or S. qeveriana communities with **mesic** herbaceous understories [1S(ST)2] .

DOMINANT PAG: 1FC(ST)2
CODOMINANT PAG: 1FC(HL)3
CODOMINANT PAG: 1S(ST)2

DOMINANT STREAM TYPE: A

Upland Regional Class: Forest 2,2

This cool, moist forest environment includes the most productive sites in the subalpine zone. Moisture generally is not limiting and the environment is relatively mild, as indicated by higher plant species richness.

VALLEY BOTTOM TYPES

DOMINANT: (2,2) Moderate Width, Moderate Slope
CODOMINANT1: (2,3) Moderate Width, Flat
CODOMINANT2: (1,1) Narrow, Steep

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, moderately steep valley bottoms are dominated by closed Abies grandis, A. amabilis, Thuja plicata, and/or Tsuga heterophylla forests with low herbaceous understories (e.g., Achlys triphylla) or Picea engelmannii forests with Equisetum arvense in the understory [1FC(HL)2]. Tall Salix spp. types with moist understories [1S(ST)2] and closed conifer forests with Linnaea borealis and/or Acer circinatum are common [1FC(ST)2]. Closed Abies spp., Picea spp., and/or Tsuga spp. forests with drier site forbs (e.g., Clintonia uniflora, Gymnocarpium dryopteris, Galium triflorum) are present as inclusions [1FC(HL)3] .

DOMINANT PAG: 1FC(HL)2
CODOMINANT PAG: 1S(ST)2
CODOMINANT PAG: 1FC(ST)2
INCLUSION PAG: 1FC(HL)3

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Codominant Valley Bottom1: The moderately wide, flat valley bottoms are dominated by a large and diverse group of tall, wet shrub types.

Alnus incana, Betula occidentalis, Cornus stolonifera, Salix boothii, S. exiqua, and/or S. severiana communities are common [3S(ST)1]. Closed forests with drier site shrubs, such as Abies lasiocarpa/Taxus brevifolia communities [1FC(ST)3] codominate with wet herb types dominated by Scirpus spp., Carex utriculata, and/or Glyceria borealis [3H(HM)1].

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 1FC(ST)3
CODOMINANT PAG: 3H(HM)1

DOMINANT STREAM TYPE: C.
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley Bottom2: The narrow, steep valley bottoms are characterized by a complex of closed Abies spp. forests with tall shrubs such as Acer circinatum [1FC(ST)2]. Closed Abies grandis, A. lasiocarpa, Picea enselmannii, and/or Tsusa heterophylla forests with drier site forbs (e.g., Clintonia uniflora, Galium triflorum, Gymnocarpium dryopteris) [1FC(HL)3] are codominant with tall shrub types such as Salix boothii and/or S. severiana communities with mesic herbaceous understories [1S(ST)2].

DOMINANT PAG: 1FC(ST)2
CODOMINANT PAG: 1FC(HL)3
CODOMINANT PAG: 1S(ST)2

DOMINANT STREAM TYPE: A

Upland Regional Class: Forest 2,3

This forest environment represents cool and dry subalpine sites.

VALLEY BOTTOM TYPES

DOMINANT: (2,2) Moderate Width, Moderate Slope
CODOMINANT1: (2,3) Moderate Width, Flat
CODOMINANT2: (1,1) Narrow, Steep

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, moderately steep valley bottoms are dominated by closed Abies grandis, A. amabilis, Thuja olicata, and/or Tsuga heterophylla forests with low herbaceous understories (e.g., Achlys trichvlla); or Picea engelmannii forests with Equisetum arvense in the understory [1FC(HL)2]. Tall Salix shrub types with mesic understories [1S(ST)2], and closed conifer forests with Linnaea borealis and/or Acer circinatum are common [1FC(ST)2]. Closed Abies spp., Picea spp., and/or Tsusa spp. forests with drier site forbs (e.g., Clintonia uniflora, Gymnocarpium dryopteris, Galium triflorum) are present as inclusions [1FC(HL)3].

DOMINANT PAG: 1FC(HL)2
CODOMINANT PAG: 1S(ST)2

CODOMINANT PAG: 1FC(ST)2
INCLUSION PAG: 1FC(HL)3

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Codominant Valley Bottom1: The moderately wide, flat valley bottoms are dominated by a large and diverse group of tall, wet shrublands. Alnus incana, Betula occidentalis, Cornus stolonifera, Salix boothii, S. exigua, and/or S. severiana communities are common [3S(ST)1]. Closed forests with drier site shrubs, such as Abies lasiocarpa/Taxus brevifolia communities [1FC(ST)3] codominate with wet herb types dominated by Scirpus sdd., Carex utriculata, and/or Glyceria borealis [3H(HM)1].

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 1FC(ST)3
CODOMINANT PAG: 3H(HM)1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley Bottom2: The narrow, steep valley bottoms are dominated by closed Abies grandis, A. lasiocarpa, Picea enselmannii, and/or Tsuga heterophylla forests with drier site forbs (e.g., Clintonia uniflora, Galium triflorum, Gymnocarpium dryopteris) [1FC(HL)3]. A complex of closed Abies sdd. forests with tall shrubs such as Acer circinatum [1FC(ST)2] and tall shrub types such as Salix boothii and/or S. qeveriana communities with mesic herbaceous understories [1S(ST)2] is also present.

DOMINANT PAG: 1FC(HL)3
CODOMINANT PAG: 1FC(ST)2
CODOMINANT PAG: 1S(ST)2

DOMINANT STREAM TYPE: A

Upland Regional Class: Forest 2,4

This cool, very dry environment is the driest and warmest of the subalpine forest zone. It only occurs in six sections of the Columbia River Basin (Appendix-).

VALLEY BOTTOM TYPES

DOMINANT: (2,2) Moderate Width, Moderate Slope
CODOMINANT1: (2,3) Moderate Width, Flat
CODOMINANT2: (1,1) Narrow, Steep

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, moderately steep valley bottoms are dominated by closed Abies sgrandis, A. amabilis, Thuja plicata, and/or Tsuga heterophylla forests with

low herbaceous understories (e.g., Achlys triophylla); or Picea engelmannii forests with Equisetum arvense in the understory [1FC(HL)2]. Tall Salix SDD. types with mesic understories [1S(ST)2], and closed conifer forests with Linnaea borealis and/or Acer circinatum are common [1FC(ST)2]. Closed Abies SDD., Picea SDD., and/or Tsusa spp. forests with drier site forbs (e.g., Clintonia uniflora, Gymnocarpium dryopteris, Galium triflorum) are present as inclusions (1FC(HL)3).

DOMINANT PAG: 1FC(HL)2
CODOMINANT PAG: 1S(ST)2
CODOMINANT PAG: 1FC(ST)2
INCLUSION PAG: 1FC(HL)3

Codominant Valley Bottom1: The moderately wide, flat valley bottoms are dominated by a large and diverse group of tall, wet shrublands. Alnus incana, Betula occidentalis, Cornus stolonifera, Salix boothii, S. exiqua, and/or S. severiana communities are common [3S(ST)1]. Closed forests with drier site shrubs, such as Abies lasiocarpa/Taxus brevifolia communities [1FC(ST)3] codominate with wet herb types dominated by Scirpus spp., Carex utriculata, and/or Glyceria borealis [3H(HM)1].

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 1FC(ST)3
CODOMINANT PAG: 3H(HM)1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley Bottom2: The narrow, steep valley bottoms are characterized by a complex of closed Abies SDD. forests with tall shrubs such as Acer circinatum [1FC(ST)2]; closed Abies grandis, A. lasiocarpa, Picea engelmannii, Tsusa heterophylla forests with drier site forbs (e.g., Clintonia uniflora, Galium triflorum, Gymnocarpium dryopteris) [1FC(HL)3]. Tall shrublands such as Salix boothii and/or S. severiana types with mesic herbaceous understories are also present [1S(ST)2].

DOMINANT PAG: 1FC(ST)2
CODOMINANT PAG: 1FC(HL)3
CODOMINANT PAG: 1S(ST)2

DOMINANT STREAM TYPE: A

Upland Regional Class: Forest 3,1

This warm, wet forest environment typically occurs in the mid-montane zone of the ICB. Most sites are riparian.

VALLEY BOTTOM TYPES

DOMINANT: (2,2) Moderate Width, Moderate Slope
CODOMINANT1: (3,3) Wide, Flat

CODOMINANT2: (1,1) Narrow, Steep

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, moderately steep valley bottoms are dominated wet, closed Picea SDD., Pinus contorta, and/or Populus tremuloides forests with Caltha leotoseoala and/or Carex SDD. in the understory [1FC(HL)1]. Also common are ~~Abies lasiocarpa/Ledum splendulosum~~ and A. lasiocarpa/Oploanax horridus forests [1FC(SM)3] and tall, wet Salix SDD., Alnus incana, and/or Betula occidentalis shrub types [3S (ST)1].

DOMINANT PAG: 1FC(HL)1
CODOMINANT PAG: 1FC(SM)3
CODOMINANT PAG: 3S(ST)1

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Codominant Valley Bottom1: The wide, flat valley bottoms are dominated by a varied group of tall, wet Salix spp., Alnus incana, and/or Betula occidentalis shrub types [3S(ST)1]. Also common are closed, wet Pinus contorta-Populus tremuloides/Spirea douglasii types [1FC(SM)1] and warm, wet herblands such as Scirpus SDD., Carex utriculata, and/or Glyceria borealis communities [3H(HM)1].

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 1FC(SM)1
CODOMINANT PAG: 3H(HM)1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: E,B,D

Codominant Valley Bottom2: The narrow, steep valley bottoms are dominated by closed forests (e.g., Picea enselmannii, Abies lasiocarpa, Pinus contorta, Populus tremuloides) with wet understories dominated by Caltha leotoseoala and/or Carex spp. [1FC(HL)1]. Warmer Abies lasiocarpa closed forests [1FC(SM)3] and tall, wet shrub types dominated by Salix spp., Alnus incana, and Betula occidentalis are codominant [3S(ST)1].

DOMINANT PAG: 1FC(HL)1
CODOMINANT PAG: 1FC(SM)3
CODOMINANT PAG: 3S(ST)1

DOMINANT STREAM TYPE: A

Upland Regional Class: Forest 3,2

This warm, moist forest environment occurs in the mid-montane zone of the ICB. Most sites are very productive due to mild climate; the northern portion has a maritime climatic influence. This environment does

not occur in the High Lava Plains, Lahontan, Yellowstone, or Wind River Sections.

VALLEY BOTTOM TYPES

DOMINANT: (2,2) Moderate Width, Moderate Slope
CODOMINANT1: (3,3) Wide, Flat
CODOMINANT2: (1,1) Narrow, Steep

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, moderately steep valley bottoms are dominated by wet, closed Picea spp., Pinus contorta, and/or Populus tremuloides forests with Caltha leptosepala and/or Carex spp. in the understory [1FC(HL)1]. Also common are Abies lasiocarpa/Ledum splendens and A. lasiocarpa/Oplopanax horridus forests [1FC(SM)3]; and tall, wet Salix spp., Alnus incana, and/or Betula occidentalis shrub communities [3S(ST)1].

DOMINANT PAG: 1FC(HL)1
CODOMINANT PAG: 1FC(SM)3
CODOMINANT PAG: 3S(ST)1

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Codominant Valley Bottom1: The wide, flat valley bottoms are characterized by a varied group of tall Salix spp., Alnus incana, and/or Betula occidentalis shrublands with wet site undergrowths [3S(ST)1]. Also common are closed, wet Pinus contorta-Populus tremuloides/Spirea douglasii types [1FC(SM)1] and warm, wet herblands such as Scirpus spp., Carex utriculata, and Glyceria borealis communities [3H(HM)1].

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 1FC(SM)1
CODOMINANT PAG: 3H(HM)1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: E,B,D

Codominant Valley Bottom2: The narrow, steep valley bottoms are characterized by the same riparian PAG's as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: A

Upland Regional Class: Forest 3,3

This warm, dry forest environment occupies the mid montane zone of the ICB. Upland species which tolerate drier sites are present. It covers extensive areas throughout the ICB, and is absent

only in the High Lava Plains and Lahontan Sections.

VALLEY BOTTOM TYPES

DOMINANT: (2,2) Moderate Width, Moderate Slope
CODOMINANT1: (3,3) Wide, Flat
CODOMINANT2: (1,1) Narrow, Steep

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant **Valley Bottom**: The moderately wide, moderately steep valley bottoms are dominated by wet, closed Picea SDD., Pinus contorta, and/or Populus tremuloides forests with Caltha leptosepala and/or Carex spp. in the understory [1FC(HL)1]. Also common are Abies lasiocarpa/Ledum splendulosum and A. lasiocarpa/Oplopanax horridus forests [1FC(SM)3]; and tall, wet Salix SDD., Alnus incana, and/or Betula occidentalis shrub communities [3S(ST)1].

DOMINANT PAG: 1FC(HL)1
CODOMINANT PAG: 1FC(SM)3
CODOMINANT PAG: 3S(ST)1

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Codominant **Valley Bottom1**: The wide, flat valley bottoms are characterized by a varied group of tall Salix SDD., Alnus incana, and/or Betula occidentalis shrublands with wet site undergrowths [3S(ST)1]. Also common are closed, wet Pinus contorta/Spirea douglasii communities [1FC(SM1)] and wet herblands such as Scirous SDD., Carex utriculata, and/or Glyceria borealis types [3H(HM)1].

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 1FC(SM)1
CODOMINANT PAG: 3H(HM)1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPE: E,B,D

Codominant **Valley Bottom2**: The narrow, steep valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: A

Upland Regional Class: Forest 3,4

This forest environment represents warm, dry conditions. It spans the mid-montane zone of the ICB .

VALLEY BOTTOM TYPES

DOMINANT: (2,2) Moderate Width, Moderate Slope
CODOMINANT1: (3,3) Wide, Flat
CODOMINANT2: (1,1) Narrow, Steep

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, moderately steep valley bottoms are dominated by closed forests such as Thuja plicata, Picea spp., and Abies srandis communities with low growing, drier site herbaceous undergrowths [1FC(HL)3]. Tall, wet Salix spp., Alnus incana, Cornus stolonifera, and/or Betula occidentalis shrub communities are also common [3S(ST)1].

DOMINANT PAG: 1FC(HL)3
CODOMINANT PAG: 3S(ST)1

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Codominant Valley Bottom1: The wide, flat valley bottoms are dominated by a diverse group of tall Salix spp., Alnus incana, and/or Betula occidentalis shrublands with wet site undergrowths [3S(ST)1]. Also common are wet herblands dominated by Carex scoolorum, C. aquatilis, Eleocharis oalustris, and/or Ecruietum fluviatile [1H(HL)1]. Closed forests (e.g., Picea enslemanii, Pseudotsusa menziesii) with low herbaceous understories (e.g., Ecuissetum arvense, Achlvs triphylla) codominate [1FC(HL)2]. Closed Abies lasiocarpa forests with drier site shrub understories are present as inclusions [1FC(SM)3].

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 1H(HL)1
CODOMINANT PAG: 1FC(HL)2
INCLUSION PAG: 1FC(SM)3

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: E,B,D

Codominant Valley Bottom2: The narrow, steep valley bottoms are dominated by closed forests such as Thuja plicata, Picea spp., and Abies grandis communities with drier site herbaceous understories [1FC(HL)3]. Tall shrub types dominated by Salix spp., Alnus incana, and/or Betula occidentalis with wet site undergrowths are codominant [3S(ST)1].

DOMINANT PAG: 1FC(HL)3
CODOMINANT PAG: 3S(ST)1

DOMINANT STREAM TYPE: A

Upland Regional Class: Forest 4,1

This is the hot, wet forest environment. Within the ICB, it includes the warmest riparian forests of the lower montane zone.

VALLEY BOTTOM TYPES

DOMINANT: (3,3) Wide, Flat
CODOMINANT1: (2,2) Moderate Width, Moderate Slope
CODOMINANT2: (2,3) Moderate Width, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant **Valley Bottom**: The moderately wide, flat valley bottoms are dominated by tall, wet Salix spp., Alnus incana, Cornus stolonifera, Crataegus douglasii, and/or Betula occidentalis shrub communities [3S(ST)1]. Warm open forest communities of Juniperus scopulorum, Pinus oonderosa, and Pseudotsuga menziesii with tall, wet site shrubs in the understory (e.g., Cornus stolonifera) are common [3FO(ST)1]. Also common are wet, warm herbaceous types such as Carex utriculata, Glyceria borealis, Scirpus americanus, S. maritimus, and/or S. pungens communities [3H(HM)1].

DOMINANT PAG: 3S(ST) 1
CODOMINANT PAG: 3FO (ST) 1
CODOMINANT PAG: 3H(HM) 1

Codominant Valley Bottom1: The moderately wide, moderately steep valley bottoms are dominated by open Populus tremuloides forests with drier site shrubs (e.g., Amelanchier alnifolia, Symphoricarpos oreophilus, S. albus) and herbaceous species (e.g., Thalictrum fendleri) in the understory [3FO(SM)3]. Tall, drier site shrub types dominated by Salix boothii and/or S. severiana with Poa nratensis undergrowths are codominant [1S(ST) 3].

DOMINANT PAG: 3FO(SM) 3
CODOMINANT PAG: 1S(ST) 3

Codominant Valley Bottom2: The moderately wide, flat valley bottoms are dominated by tall wet Salix spp., Alnus incana, Cornus stolonifera, Crataegus douglasii, and/or Betula occidentalis shrub communities [3S(ST) 1]. Warm open forest communities of Juniperus scopulorum, Pinus oonderosa, and Pseudotsuga menziesii with tall, wet site shrubs in the understory (e.g., Cornus stolonifera) are common [3FO(ST)1]. Warm, wet herblands such as Carex culata, Glyceria borealis, Scirpus americanus, S. maritimus, and/or S. pungens communities [3H(HM)1] are also present.

DOMINANT PAG: 3S(ST) 1
CODOMINANT PAG: 3FO(ST) 1
CODOMINANT PAG: 3H(HM) 1

Upland Regional Class: Forest 4,2

This is the hot, moist forest environment of the lower montane

zone within the ICB. It occurs only in the Cascade/Sierras, Okanogan Highlands, High Lava Plains, and the Owyhee Uplands Sections. This is generally a lower **treeline** environment.

VALLEY BOTTOM TYPES

DOMINANT: (2,3) Moderate Width, Flat
CODOMINANT1: (3,3) Wide, Flat
CODOMINANT2: (1,1) Narrow, Steep

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, flat valley bottoms are dominated by tall, wet Salix spp., Alnus incana, Cornus stolonifera, Crataegus douglasii, and/or Betula occidentalis shrub communities [3S(ST)1]. Warm open forest communities of Juniperus scopulorum, Pinus Donderosa, and/or Pseudotsusa menziesii with tall, wet site shrubs in the understory (e.g., Cornus stolonifera) are common [3FO(ST)1]. Warm, wet herblands such as Carex utriculata, Glyceria borealis, Scirpus americanus, S. maritimus, and S. pungens communities [3H(HM)1] are also present.

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 3FO(ST)1
CODOMINANT PAG: 3H(HM)1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B,F,E

Codominant **Valley Bottom1:** The wide, flat valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: E,B,D

Codominant Valley **Bottom2:** The narrow, steep valley bottoms are dominated by tall, drier site shrub types dominated by Salix geyeriana and/or S. boothii with Poa nratensis undergrowths [1S(ST)3]. Warm, open Populus tremuloides forests with drier site shrubs (e.g., Amelanchier alnifolia, Symphoricarpos oreophilus, S. albus) and drier site herbaceous species (e.g., Thalictrum fendleri) codominate [3FO(SM)3].

DOMINANT PAG: 1S(ST)3
CODOMINANT PAG: 3FO(SM)3

DOMINANT STREAM TYPE: A

Upland Regional Class: Forest 4,3

This is the hot, dry lower **treeline** forest environment of the ICB. It occurs in all sections except the Lahontan,

Klamath/Tule, Owyhee Highlands, Wind River, Overthrust, Beaverhead, Challis, Bitterroot, Northern Rockies, Flathead, and Okanogan Highlands Sections.

VALLEY BOTTOM TYPES

DOMINANT: (3,3) Wide, Flat
CODOMINANT1: (2,3) Moderate Width, Flat
CODOMINANT2: (1,1) Narrow, Steep

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The wide, flat valley bottoms are dominated by tall shrub types such as Salix boothii, S. exigua, S. geveriana, Alnus incana, and/or Betula occidentalis with wet site understory indicator species [3S(ST)1]. Warm drier site shrub communities such as Sarcobatus vermiculatus/Distichlis stricta, and Potentilla fruticosa/Deschampsia cespitosa [3S(SM)3] are common. Warm, open forest communities of Juniperus scopulorum, Pinus ponderosa, and Pseudotsuaa menziesii with tall, wet site shrubs in the understory (e.g., Cornus stolonifera) are present [3FO(ST)1]. Warm wet herblands such as Carex utriculata, Glyceria borealis, Scirpus americanus, S. maritimus, and S. pungens communities are also present [3H(HM)1].

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 3S(SM)3
CODOMINANT PAG: 3FO(ST)1
INCLUSION PAG: 3H(HM)1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: E, B, D

Codominant Valley **Bottom1**: The moderately wide, flat valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley **Bottom2**: The narrow, steep valley bottoms are dominated by warm, tall shrub types such as Alnus incana, Salix boothii, S. lutea, and/or S. exigua with drier site undergrowth species (e.g., Rosa woodsii, Symphoricarpos albus, Poa nratensis) [3S(ST)3]. Open Populus tremuloides forests with drier site shrubs (e.g., Amelanchier alnifolia, Symphoricarpos oreophilus, S. albus) and characteristic herbaceous species (e.g., Thalictrum fendleri) are codominant [3FO(SM)3].

DOMINANT PAG: 3S(ST)3
CODOMINANT PAG: 3FO(SM)3

DOMINANT STREAM TYPE: A

Upland Regional Class: Forest 4,4

This is the hottest and the driest forest environment of the ICB. Stand structure is typically open.

VALLEY BOTTOM TYPES

DOMINANT: (2,3) Moderate Width, Flat
CODOMINANT1: (2,2) Moderate Width, Moderate Slope
CODOMINANT2: (1,1) Narrow, Steep

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, flat valley bottoms are dominated by tall, wet shrub communities such as Salix boothii, S. exigua, S. ueveriana, Alnus incana, and/or Betula occidentalis [3S(ST)1]. Warm, drier site shrub communities such as Sarcobatus vermiculatus/Distichlis stricta, and Potentilla fruticosa/Deschampsia cespitosa [3S(SM)3] codominate with warm herbaceous communities such as Eleocharis oalustris, Juncus balticus, and Carex nebrascensis [3H(HL)2]. Warm, wet herblands such as Carex aperta, C. lanuginosa, and/or C. simulata communities are inclusions [3H(HL)1].

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 3S(SM)3
CODOMINANT PAG: 3H(HL)2
INCLUSION PAG: 3H(HL)1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPE: B,F,E

Codominant Valley Bottom1: The moderately wide, moderately steep valley bottoms are dominated by tall, wet Salix sop., Alnus incana, Cornus stolonifera, Crataegus douglasii, and/or Betula occidentalis shrubland communities [3S(ST)1]. Warm, drier site shrub communities, such as Sarcobatus vermiculatus/Distichlis stricta, and Potentilla fruticosa/Deschampsia cespitosa [3S(SM)3] codominate with warm, drier site, tall shrub types such as Salix boothii, S. lutea, S. exigua, and/or Alnus incana, with Rosa woodsii, Symphoricarpos albus, and/or Poa oratensis in the understory [3S(ST)3].

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 3S(SM)3
CODOMINANT PAG: 3S(ST)3

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Codominant Valley Bottom2: The narrow, steep valley bottoms are dominated by warm, open Populus tremuloides forests with drier site shrubs such as Amelanchier alnifolia, Symphoricarpos u s, and/or S. albus, and drier site herbaceous species (e.g., Thalictrum

fendleri) in the understory [3FO(SM)3]. Warm, drier site, tall shrub types such as Salix boothii, S. lutea, S. exigua and/or Alnus incana with drier site undergrowth species (e.g., Rosa woodsii, Symphoricarpos albus, and Poa pratensis are codominant [3S(ST)3]. Also common are tall wet shrublands such as Salix boothii, S. exigua, S. oeyeriana, Alnus incana, and/or Betula occidentalis [3S(ST)1].

DOMINANT PAG: 3FO(SM)3
CODOMINANT PAG: 3S(ST)3
CODOMINANT PAG: 3S(ST)1

DOMINANT STREAM TYPE: A

Upland Regional Class: Shrubland 1,1

This is the coldest and the wettest shrubland environment in the ICB. It spans the alpine and upper subalpine zone, and occupies frost pockets at low elevations in the subalpine zone.

VALLEY BOTTOM TYPES'

DOMINANT: (2,2) Moderate Width, Moderate Slope
CODOMINANT1: (1,2) Narrow, Moderate Slope
CODOMINANT2: (1,3) Narrow, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, moderately steep valley bottoms are dominated by wet shrub types such as Salix planifolia and S. eastwoodiae communities with Carex utriculata and/or C. aquatilis in the understory [1S(SM)1]. Also present are wet, low shrublands such as Salix wolfii and/or Kalmia microohvlla types [1S(SL)1], and wet herblands such as Carex sdd., Eleocharis sdd., and/or Equisetum fluviatile communities [1H(HL)1].

DOMINANT PAG: 1S(SM)1
CODOMINANT PAG: 1S(SL)1
CODOMINANT PAG: 1H(HL)1

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Codominant Valley Bottom1: The narrow, moderately steep valley bottoms are characterized by the same riparian PAG's as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: A
CODOMINANT STREAM TYPE: B

Codominant Valley Bottom2: The narrow, flat valley bottoms are characterized by the same riparian PAG's as the dominant valley bottom. See above description.

DOMINANT **STREAM** TYPE: B
CODOMINANT **STREAM** TYPE: C

Upland Regional Class: Shrubland 1,2

This is the cold, moist shrubland environment in **the ICB**. It occupies snow loaded areas in the the northern Rocky Mountains and Okanogan Highlands sections.

VALLEY BOTTOM TYPES

DOMINANT: (1,2) Narrow, Moderate Slope
CODOMINANT1: (1,3) Narrow, Flat
CODOMINANT2: (2,2) Moderate Width, Moderate Slope

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The narrow, moderately steep valley bottoms are dominated by wet shrub types such as Salix planifolia and S. eastwoodiae communities with Carex utriculata and/or C. aquatilis undergrowths [1S(SM)1]. Wet herblands (e.g., Carex ssp., Eleocharis ssp., Ecrusetum fluviatile communities) [1H(HL)1] and relatively drier herblands (e.g., Carex nebrascensis, C. nisricans, Juncus balticus types) [1H(HL)2] are also present.

DOMINANT PAG: 1S(SM)1
CODOMINANT PAG: 1H(HL)1
CODOMINANT PAG: 1H(HL)2

DOMINANT **STREAM** TYPE: A
CODOMINANT **STREAM** TYPE: B

Codominant Valley Bottom1: The narrow, flat valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT **STREAM** TYPE: B
CODOMINANT **STREAM** TYPE: C

Codominant Valley Bottom2: The moderately wide, moderately steep valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT **STREAM** TYPE: B
CODOMINANT **STREAM** TYPE: A

Upland Regional Class: Shrubland 1,3

This is the cold, dry shrubland environment in the ICB. It only occurs in the eastern half of the ICB, in sections which have carbonate geologic material.

VALLEY BOTTOM TYPES

DOMINANT: (1,2) Narrow, Moderate Slope
CODOMINANT1: (1,3) Narrow, Flat
CODOMINANTZ: (2,2) Moderate Width, Moderate Slope

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The narrow, moderately steep valley bottoms are dominated by wet shrub types such as Salix nlanifolia and S. eastwoodiae communities with Carex utriculata and/or C. acruatilis undergrowths [1S(SM)1]. Wet herblands (e.g., Carex spp, Eleocharis SDD., Euuisetum fluviatile communities) [1H(HL)1] and relatively drier herb types (e.g., Carex nebrascensis, C. nigricans, Juncus balticus types) [1H(HL)2] are also present.

DOMINANT PAG: 1S(SM)1
CODOMINANT PAG: 1H(HL)1
CODOMINANT PAG: 1H(HL)2

DOMINANT STREAM TYPE: A
CODOMINANT STREAM TYPE: B

Codomihant Valley Bottom1: The narrow, flat valley bottoms are characterized by the same riparian PAG's as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: C

Codominant Valley Bottom2: The moderately wide, moderately steep valley bottoms are characterized by the same riparian PAG's as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Upland Regional Class: Shrubland 1,4

This is the coldest, driest shrubland environment in the ICB. It only occurs in the alpine zone of the Warner Mountains in the Klamath/Tule Lake/Northern Sierra Nevada Mountains Section.

VALLEY BOTTOM TYPES

DOMINANT: (1,2) Narrow, Moderate Slope
CODOMINANT1: (1,3) Narrow, Flat
CODOMINANTZ: (2,2) Moderate Width, Moderate Slope

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The narrow, moderately steep valley

Bottoms are dominated by wet shrub types such as Salix planifolia and S. eastwoodiae communities with Carex utriculata and/or C. aquatilis undergrowths [1S(SM)1]. Wet herblands (e.g., Carex SDD., Eleocharis SDD., Equisetum fluviatile communities) [1H(HL)1] and relatively drier herb types (e.g., Carex nebrascensis, C. nisricans, Juncus balticus types) [1H(HL)2] are also present.

DOMINANT PAG: 1S(SM)1
CODOMINANT PAG: 1H(HL)1
CODOMINANT PAG: 1H(HL)2

DOMINANT STREAM TYPE: A
CODOMINANT STREAM TYPE: B

Codominant Valley Bottom1: The narrow, flat valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: C

Codominant Valley **Bottom2**: The moderately wide, moderately steep valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Upland Regional Class: Shrubland 2,1

This is the cool, wet shrubland environment of the ICB. It occurs mainly in the northern portions, and some isolated southern mountain ranges, primarily in the northern Great Basin. Sites are within the montane **zone** and generally occupy narrow corridors along rivers and streams, or alluvial flats in some higher elevation valleys. The sites are typically very productive due to deep alluvial soils.

VALLEY BOTTOM TYPES

DOMINANT: (3,3) Wide, Flat
CODOMINANT: (2,3) Moderate Width, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The wide, flat valley bottoms are dominated by tall, wet shrublands, (e.g., Salix boothii, S. drummondiana, S. geveiana, Alnus incana types) with Calamasrostis canadensis, Carex aquatilis, and/or C. utriculata undergrowths [1S(ST)1]. Also present are wet shrub types such as Salix planifolia and S. eastwoodiae communities with Carex utriculata and/or C. aquatilis undergrowths [1S(SM)1]. Herbaceous communities such as Deschamosia cesoitosa and Senecio

triangularis types [1H(HM)2] may also be present.

DOMINANT PAG: 1S(ST)1
CODOMINANT PAG: 1S(SM)1
CODOMINANT PAG: 1H(HM)2

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: E,B,D

Codominant Valley Bottom: The narrow, flat valley bottoms are characterized by the same riparian PAG's as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B,F,E

Upland Regional Class: Shrubland 2,2

This is the cool, moist shrubland and montane steppe environment of the ICB. It occurs in all sections, all aspects, slopes and soil types. At low elevations, it occupies north-facing slopes with deep soils.

VALLEY BOTTOM TYPES

DOMINANT: (2,3) Moderate Width, Flat
CODOMINANT1: (1,2) Narrow, Moderate Slope
CODOMINANT2: (3,3) Wide, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, flat valley bottoms are dominated by tall, wet shrublands, (e.g., Salix boothii, S. drummondiana, S. geveriana, Alnus incana types) with Calamagrostis canadensis, Carex aquatilis, and/or C. utriculata undergrowths [1S(ST)1]. Also present are wet Carex spp., Eleocharis spp., and Equisetum fluviatile herbaceous communities [1H(HL)1], and a diverse group of wet medium-height herblands, including Deschampsia cesnitosa-Caltha leptosepala, Carex utriculata, and Calamagrostis canadensis communities [1H(HM)1].

DOMINANT PAG: 1S(ST)1
CODOMINANT PAG: 1H(HL)1
CODOMINANT PAG: 1H(HM)1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B,F,E

Codominant Valley Bottom: The narrow, moderately steep valley bottoms are dominated by tall, wet shrublands, (e.g., Salix boothii, S. drummondiana, S. geveriana, Alnus incana types) with Calamagrostis canadensis, Carex aquatilis, and/or C. utriculata undergrowths [1S(ST)1]. Salix boothii and S. geveriana with mesic

herbaceous undergrowths, and Cornus stolonifera communities are codominant [1S(ST)2]. Also present are closed Abies lasiocarpa/Rhododendron albiflorum, A. amabilis/Oplopanax horridus, Thuia plicata/O. horridus, and Tsuga heterophylla/O. horridus forest types [1FC(SM) 2].

DOMINANT PAG: 1S(ST)1
CODOMINANT PAG: 1S(ST)2
CODOMINANT PAG: 1FC(SM)2

DOMINANT STREAM TYPE: A
CODOMINANT STREAM TYPE: B

Codominant Valley Bottom2: The wide, flat valley bottoms are characterized by the same riparian PAG's as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: E,B,D

Upland Regional Class: Shrubland 2,3

This is the cool, dry shrubland environment of the ICB. It is a minor, but extremely diverse habitat.

VALLEY BOTTOM TYPES

DOMINANT: (2,2) Moderate Width, Moderate Slope
CODOMINANT1: (1,2) Narrow, Moderate Slope
CODOMINANT2: (2,3) Moderate Width, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, moderately steep valley bottoms are dominated by tall, wet shrublands, (e.g., Salix boothii, S. drummondiana, S. geveriana, Alnus incana types) with Calamagrostis canadensis, Carex aquatilis, and/or C. utriculata undergrowths [1S(ST) 1]. Salix boothii and S. geveriana with mesic herbaceous undergrowths, and Cornus stolonifera communities are codominant [1S(ST)2]. Also present are closed Abies lasiocarpa/Rhododendron albiflorum, A. amabilis/Oplopanax horridus, Thuia plicata/O. horridus, and Tsuga heterophylla/O. horridus forest types [1FC(SM)2].

DOMINANT PAG: 1S(ST)1
CODOMINANT PAG: 1S(ST)2
CODOMINANT PAG: 1FC(SM)2

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Codominant Valley Bottom1: The narrow, moderately steep valley bottoms are characterized by the same riparian PAG's as the

dominant valley bottom. See above description.

DOMINANT STREAM TYPE: A
CODOMINANT STREAM TYPE: B

Codominant Valley **Bottom2**: The moderately wide, flat valley bottoms are dominated by tall, wet shrublands, (e.g., Salix boothii, S. drummondiana, S. geveriana, Alnus incana types) with Calamasrostis canadensis, Carex aquatilis, and/or C. utriculata undergrowths [1S(ST)1]. Also present are Wet Carex spp., Eleocharis spp., and Equisetum fluviatile herbaceous types [1H(HL)1]. Slightly drier herbaceous communities, such as Deschampsia cesnitosa and Senecio triangularis types may also be present [1H(HM)2].

DOMINANT PAG: 1S(ST)1
CODOMINANT PAG: 1H(HL)1
CODOMINANT PAG: 1H(HM)2

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B,F,E

Upland Regional Class: Shrubland 2,4

This is the cool, very dry montane shrubland environment of the ICB. It is fairly minor, **occurring** only in the northeastern and southeastern sections.

VALLEY BOTTOM TYPES

DOMINANT: (2,2) Moderate Width, Moderate Slope
CODOMINANT1: (1,2) Narrow, Moderate Slope
CODOMINANT2: (2,3) Moderate Width, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, moderately steep valley bottoms are dominated by tall, wet shrublands, (e.g., Salix boothii, S. drummondiana, s. geveriana, Alnus incana types) with Calamasrostis canadensis, Carex aquatilis, and/or C. utriculata undergrowths [1S(ST)1]. Salix boothii and S. severiana with mesic herbaceous undergrowths, and Cornus stolonifera communities are codominant [1S(ST)2]. Also present are closed Abies lasiocarpa/Rhododendron albiflorum, A. amabilis/Oplopanax horridus, Thuja plicata/O. horridus, and Tsusa heterophylla/O. horridus forest types [1FC(SM)2].

DOMINANT PAG: 1S(ST)1
CODOMINANT PAG: 1S(ST)2
CODOMINANT PAG: 1FC(SM)2

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Codominant Valley Bottom1: The narrow, moderately steep valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: A
CODOMINANT STREAM TYPE: B

Codominant Valley **Bottom2**: The moderately wide, flat valley bottoms are dominated by tall, wet shrublands, (e.g., Salix boothii, S. drummondiana, S. qeveriana, Alnus incana types) with Calamasrostis canadensis, Carex aquatilis, and/or C. utriculata undergrowths [**1S(ST)1**]. Also present are wet Carex spp., Eleocharis spp., and Equisetum fluviatile herbaceous types [**1H(HL)1**]. Slightly drier herbaceous communities, such as Deschampsia cespitosa and Senecio trianquularis types may also be present [**1H(HM)2**].

DOMINANT PAG: **1S(ST)1**
CODOMINANT PAG: **1H(HL)1**
CODOMINANT PAG: **1H(HM)2**

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: **B,F,E**

Upland Regional Class: Shrubland **3,1**

This is the warm, wet shrubland environment of the ICB. It includes the mid-montane riparian habitats, canyons with deep soils, flats and **playas** throughout the area.

VALLEY BOTTOM TYPES

DOMINANT: **(3,3)** Wide, Flat
CODOMINANT: **(2,3)** Moderate Width, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The wide, flat valley bottoms are dominated by wet shrub types, including Alnus incana, Betula occidentalis, Salix boothii, S. exigua, and S. severiana communities [**3S(ST)1**]. Closed Alnus rhombifolia, Populus angustifolia, P. tremuloides, and/or P. balsamifera forests with wet, tall shrub undergrowths (e.g., Cornus stolonifera, Betula occidentalis) [**3FC(ST)1**] are also present. Wet Carex spp., Eleocharis spp., Equisetum fluviatile, and Scirous cesnitosus herblands are also common [**3H(HL)1**].

DOMINANT PAG: **3S(ST)1**
CODOMINANT PAG: **3FC(ST)1**
CODOMINANT PAG: **3H(HL)1**

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: **E,B,D**

Codominant Valley Bottom: The moderately wide, flat valley bottoms are dominated by wet shrub types, including Alnus incana, Betula occidentalis, Salix boothii, S. exiqua, and S. qeyeriana communities [3S(ST)1]. Closed Alnus rhombifolia, Populus angustifolia, P. tremuloides, and/or P. balsamifera forests with wet, tall shrub undergrowths (e.g., Cornus stolonifera, Betula occidentalis) [3FC(ST)1] are also present.

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 3FC(ST)1

Upland Regional Class: Shrubland 3,2

This is the **warm**, moist shrub-steppe environment of the ICB. It generally occurs on deep loess, alluvial or sandy soils, on gentle slopes and flats.

VALLEY BOTTOM TYPES

DOMINANT: (2,2) Moderate Width, Moderate Slope
CODOMINANT1: (2,3) Moderate Width, Flat
CODOMINANT2: (1,1) Narrow, Steep

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, moderately steep valley bottoms are dominated by wet Alnus incana, Betula occidentalis, Salix boothii, S. exiqua, and/or S. qeveriana shrub types [3S(ST)1]. Warm shrublands such as Sarcobatus vermiculatus, Potentilla fruticosa, and/or Symphoricarpos occidentalis [3S(SM)3] codominate with open Juniperus scopulorum, Pinus Donderosa, and/or Pseudotsusa menziesii forest types with tall shrub understories [3FO(ST)1].

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 3S(SM)3
CODOMINANT PAG: 3FO(ST)1

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Codominant Valley Bottom: The moderately wide, flat valley bottoms are dominated by closed Alnus rhombifolia, Populus angustifolia, P. tremuloides, and/or P. balsamifera types with Cornus stolonifera and/or Betula occidentalis in the understory [3FC(ST)1]. Wet Alnus incana, Betula occidentalis, Salix boothii, S. exiqua, and/or S. qeveriana shrub types are codominant [3S(ST)1].

DOMINANT PAG: 3FC(ST)1
CODOMINANT PAG: 3S(ST)1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley Bottom2: The narrow, steep valley bottoms are dominated by wet Alnus incana, Betula occidentalis, Salix boothii, S. exiqua, and/or S. geveriana shrub types [3S(ST)1]. Closed Alnus rhombifolia, Populus angustifolia, P. tremuloides, and/or P. balsamifera forests with Cornus stolonifera and/or Betula occidentalis in the understory are common [3FC(ST)1]. Artemisia tridentata/Poa fendleriana and/or Rosa woodsii communities also are present [3S(SM)2].

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 3FC(ST)1
CODOMINANT PAG: 3S(SM)2

DOMINANT STREAM TYPE: A

Upland Regional Class: Shrubland 3,3

This is the warm, dry shrubland environment of the ICB. It is widely distributed on all slopes, aspects and soil types; it is dominant primarily in the southern sections.

VALLEY BOTTOM TYPES

DOMINANT: (2,3) Moderate Width, Flat
CODOMINANT1: (2,2) Moderate Width, Moderate Slope
CODOMINANT2: (1,1) Narrow, Steep

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, flat valley bottoms are dominated by warm shrublands such as Sarcobatus vermiculatus, Potentilla fruticosa, and/or Symphoricarpos occidentalis types [3S(SM)3]. Alnus incana, Betula occidentalis, Salix boothii, S. exiqua, and/or S. geveriana wet shrub types codominate [3S(ST)1] with open Juniperus scopulorum, Pinus ponderosa, and/or Pseudotsuga menziesii forest communities with tall shrub understories [3FO(ST)1].

DOMINANT PAG: 3S(SM)3
CODOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 3FO(ST)1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPE: B,F,E

Codominant Valley Bottom1: The moderately wide, moderately steep valley bottoms are dominated by Alnus incana, Betula occidentalis, Salix boothii, S. exiqua, and/or S. geveriana wet shrub types [3S(ST)1]. Open Juniperus scopulorum, Pinus ponderosa, and/or Pseudotsuga menziesii forest types with tall shrub understories [3FO(ST)1] codominate with warm shrub types such as Sarcobatus vermiculatus, Potentilla fruticosa, and/or Symphoricarpos occidentalis [3S(SM)3].

DOMINANT PAG: 3S (ST) 1
CODOMINANT PAG: 3FO (ST) 1
CODOMINANT PAG: 3S (SM) 3

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Codominant Valley **Bottom2**: The narrow, steep valley bottoms are dominated by Alnus incana, Betula occidentalis, Salix boothii, S. exiqua, and/or S. geveriana wet shrub types [3S (ST) 1]. Closed Alnus rhombifolia, Populus angustifolia, P. tremuloides, and/or P. balsamifera forests codominate with Comus stolonifera and/or Betula occidentalis shrubs in the understory [3FC (ST) 1]. Artemisia tridentata/Poa fendleriana and/or Rosa woodsii communities also are present [3S (SM) 2].

DOMINANT PAG: 3S (ST) 1
CODOMINANT PAG: 3FC (ST) 1
CODOMINANT PAG: 3S (SM) 2

DOMINANT STREAM TYPE: A

Upland Regional Class: Shrubland 3,4

This is the warm, driest shrubland environment of the ICB. It includes scablands and shallow soil flats, barren ash slopes, steep **rimrock** and talus cliffs.

VALLEY BOTTOM TYPES

DOMINANT: (1,1) Narrow, Steep
CODOMINANT1: (2,2) Moderate Width, Moderate Slope
CODOMINANT2: (1,2) Narrow, Moderate Slope

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The narrow, steep valley bottoms are dominated by wet Alnus incana, Betula occidentalis, Salix boothii, S. exiqua, and/or S. severiana shrub types [3S (ST) 1]. Spiraea douglasii shrublands are codominant [3S (SM) 1].

DOMINANT PAG: 3S (ST) 1
CODOMINANT PAG: 3S (SM) 1

DOMINANT STREAM TYPE: A

Codominant Valley Bottom1: The moderately wide, moderately steep valley bottoms are dominated by wet Alnus incana, Betula occidentalis, Salix boothii, S. exiqua, and/or S. severiana shrub types [3S (ST) 1]. Closed Populus angustifolia, P. balsamifera, and/or P. tremuloides forests with Comus stolonifera and/or Betula occidentalis in the understory are common [3FC (ST) 1].

DOMINANT PAG: 3S (ST) 1

CODOMINANT PAG: 3FC (ST) 1

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Codominant Valley Bottom2: The narrow, moderately steep valley bottoms are dominated by wet Alnus incana, Betula occidentalis, Salix boothii, S. exigua, and/or S. severiana shrub types [3S (ST) 1]. Artemisia tridentata/Poa fendleriana and/or Rosa woodsii communities codominate [3S (SM) 2].

DOMINANT PAG: 3S (ST) 1
CODOMINANT PAG: 3S (SM) 2

DOMINANT STREAM TYPE: A
CODOMINANT STREAM TYPE: B

Upland Regional Class: Shrubland 4,1

This is the hot, wet riparian shrubland environment of the ICB. It typically includes the flat, alluvial valley bottom habitats.

VALLEY BOTTOM TYPES

DOMINANT: (3,3) Wide, Flat
CODOMINANT1: (2,3) Moderate Width, Flat
CODOMINANT2: (1,3) Narrow, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The wide, flat valley bottoms are dominated by tall, wet Typha latifolia, Phalaris arundinacea, Phragmites australis, and/or Scirpus acutus herbaceous types [3H (HT) 11]. Closed Populus trichocarpa and/or P. balsamifera forests with wet understory shrubs (e.g., Comus stolonifera, Betula occidentalis) are codominant [3FC (ST) 11]. Also present are wet Alnus incana, Betula occidentalis, Salix boothii, S. exigua, and/or S. severiana shrub types [3S (ST) 1]. Drier site shrub types dominated by Sarcobatus vermiculatus, Potentilla fruticosa, and/or Symphoricarpos occidentalis are present as inclusions [3S (SM) 3].

DOMINANT PAG: 3H (HT) 1
CODOMINANT PAG: 3FC (ST) 1
CODOMINANT PAG: 3S (ST) 1
INCLUSION PAG: 3S (SM) 3

Codominant Valley Bottom1: The moderately wide, flat valley bottoms are dominated by wet Alnus incana, Betula occidentalis, Salix boothii, S. exigua, and/or S. severiana shrub types [3S (ST) 1]. Tall, wet Typha latifolia, Phalaris arundinacea, Phragmites australis, and/or Scirpus acutus herbaceous types [3H (HT) 1] are present, along with shorter Poa secunda, P. fendleriana, and Carex spp. types [3H (HL) 3].

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 3H(HT)1
CODOMINANT PAG: 3H(HL)3

Codominant Valley Bottom2: The narrow, flat valley bottoms are dominated by wet Alnus incana, Betula occidentalis, Salix boothii, S. exiqua, and/or S. severiana shrub types [3S(ST)1]. Sarcobatus vermiculatus, Potentilla fruticosa, and/or Symphoricarpos occidentalis drier site shrub types [3S(SM)3] codominate with Eleocharis spp., Carex spp., Equisetum fluviatile, and/or Scirpus cespitosus herbaceous types [3H(HL)1].

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 3S(SM)3
CODOMINANT PAG: 3H(HL)1

Upland Regional Class: Shrubland 4,2

This is the hot, moist shrubland environment of the ICB. All sites have flat or gentle slopes, and occupy closed basin lake margins, annually flooded **playas**, desert stream floodplains, and/or seasonally flooded valley bottoms. It occurs primarily in the southern sections of the ICB.

VALLEY BOTTOM TYPES

DOMINANT: (3,3) Wide, Flat
CODOMINANT1: (2,3) Moderate Width, Flat
CODOMINANT2: (1,3) Narrow, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The wide, flat valley bottoms are dominated by warm, drier site Sarcobatus vermiculatus, Potentilla fruticosa, and/or Symphoricarpos occidentalis shrub communities [3S(SM)3]. Closed Populus angustifolia, P. balsamifera, and/or P. tremuloides forests with Comus stolonifera and/or Betula occidentalis in the understory [3FC(ST)1] codominate with warm, wet Typha latifolia, Phalaris arundinacea, Phragmites australis, and/or Scirpus acutus communities [3H(HT)1].

DOMINANT PAG: 3S(SM)3
CODOMINANT PAG: 3FC(ST)1
CODOMINANT PAG: 3H(HT)1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPE: E,B,D

Codominant Valley Bottom1: The moderately wide, flat valley bottoms are dominated by warm, drier site Sarcobatus vermiculatus, Potentilla fruticosa, and/or Symphoricarpos occidentalis shrub communities [3S(SM)3]. Tall, wet Typha latifolia, Phalaris arundinacea, Phragmites australis, and/or Scirpus acutus herbaceous types [3H(HT)1] codominate with wet

Eieocharis spp., Carex spp., Equisetum fluviatile, and/or Scirous cesnitosus communities [3H(HL) 11.

DOMINANT PAG: 3S (SM) 3
CODOMINANT PAG: 3H (HT) 1
CODOMINANT PAG: 3H (HL) 1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley Bottom2: The narrow, flat valley bottoms are characterized by the same riparian **PAG's** as the codominant valley bottom. See above description.

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPES: C

Upland Regional Class: Shrubland 4, 3

This is the hot, dry shrubland environment of the ICB. It generally occupies the margins of basins in the southern sections of the ICB, on gentle slopes and flats with mostly deep, alkaline soils.

VALLEY BOTTOM TYPES

DOMINANT: (2,3) Moderate Width, Flat
CODOMINANT1: (3,3) Wide, Flat
CODOMINANT2: (1,2) Narrow, Moderate Slope

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, flat valley bottoms are dominated by Sarcobatus vermiculatus, Potentilla fruticosa, and/or Symphoricarpos occidentalis shrub communities [3S (SM) 3]. Elymus cinereus grass types [3H (HT) 3] codominate with wet Typha latifolia, Phalaris arundinacea, Phragmites australis, and/or Scirpus acutus communities [3H (HT) 11.

DOMINANT PAG: 3S (SM) 3
CODOMINANT PAG: 3H (HT) 3
CODOMINANT PAG: 3H (HT) 1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley Bottom1: The wide, flat valley bottoms are dominated by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: E, B, D

Codominant Valley Bottom2: The narrow, moderately steep valley

bottoms are dominated by Salix boothii, S. exiqua, and/or S. lutea shrub types with Rosa woodsii, Ribes aureum and drier site herbaceous species in the undergrowth [**3S(ST)3**]. Wet Alnus incana, Betula ~~Sedident~~boothii, S. exiqua, and/or S. geveriana shrub types [**3S(ST)1**] codominate with drier site Sarcobatus vermiculatus, Potentilla fruticosa, and/or Symphoricarpos occidentalis shrub types [**3S(SM)3**].

DOMINANT PAG: **3S(ST)3**
CODOMINANT PAG: **3S(ST)1**
CODOMINANT PAG: **3S(SM)3**

DOMINANT STREAM TYPE: A
CODOMINANT STREAM TYPE: B

Upland Regional Class: Shrubland **4,4**

This is the hottest, driest shrubland environment of the ICB. These **playa**, dune, or barren habitats dominate most basins in Nevada, southeastern Oregon, southern Idaho and northwestern Utah.

VALLEY BOTTOM TYPES

DOMINANT: (3,3) Wide, Flat
CODOMINANT1: (2,3) Moderate Width, Flat
CODOMINANT2: (1,3) Narrow, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The wide, flat valley bottoms are dominated by drier site communities, such as Sarcobatus vermiculatus/Distichlis stricta, Potentilla fruticosa/Deschampsia cespitosa, and/or Symphoricarpos occidentalis shrub types [**3S(SM)3**]. Eleocharis spp., Carex spp., Equisetum fluviatile, and/or Scirpus cespitosus wet **herbland** types [**3H(HL)1**] codominate with wet Typha latifolia, Phalaris arundinacea, Phragmites australis, and/or Scirpus acutus herbaceous types [**3H(HT)1**].

DOMINANT PAG: **3S(SM)3**
CODOMINANT PAG: **3H(HL)1**
CODOMINANT PAG: **3H(HT)1**

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: E,B,D

Codominant Valley Bottom1: The moderately wide, flat **playa** valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B,F,E

Codominant Valley **Bottom2**: The narrow, flat valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPES: C :

Upland Regional Class: **Herbland 1,1**

This is the coldest, wettest **herbland** environment in the ICB. It occupies the alpine and high subalpine zone, generally on saturated organic substrates.

VALLEY BOTTOM TYPES

DOMINANT: (2,3) Moderate Width, Flat
CODOMINANT1: (1,3) Narrow, Flat
CODOMINANT2: (1,2) Narrow, Moderate Slope

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, flat valley bottoms (g.g., cirque basins) are dominated by low, wet sedge communities, including Carex scopulorum, C. aquatilis, and C. utriculata types [H(HL) 1]. Carex nebrascensis and Juncus balticus communities [1H(HL) 2] codominate with Deschampsia cespitosa and Senecio trianularis types [1H(HM) 2].

DOMINANT PAG: 1H(HL) 1
CODOMINANT PAG: 1H(HL) 2
CODOMINANT PAG: 1H(HM) 2

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley Bottom1: The narrow, flat valley bottoms are characterized by the same riparian PAG's as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: C

Codominant Valley Bottom2: The narrow, moderately steep valley bottoms are dominated by Deschampsia cesoitosa and Senecio trianularis types [1H(HM) 2]. Drier Mertensia ciliata and Asrostis stolonifera types [1H(HM) 3], and Carex nebrascensis and Juncus balticus types [1H(HL) 2] are present as codominants.

DOMINANT PAG: 1H(HM) 2
CODOMINANT PAG: 1H(HM) 3
CODOMINANT PAG: 1H(HL) 2

DOMINANT STREAM TYPE: A
CODOMINANT STREAM TYPE: B

Upland Regional Class: **Herbland 1,2**

This is the cold, moist **herbland** environment of the ICB. It occupies alpine and high subalpine zones, and may be associated with late **snowmelt** sites. Substrates are usually not saturated season-long.

VALLEY BOTTOM TYPES

DOMINANT: (1,3) Narrow, Flat
CODOMINANT: (2,3) Moderate Width, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The narrow, flat valley bottoms are dominated by Deschamosia cesoitosa and Senecio triangularis communities [1H(HM)2]. Low, wet sedge communities, including Carex scopulorum, C. aquatilis, C. simulata, and C. utriculata types [H(HL) 1] codominate with low shrub types, including Artemisia cana and Salix wolfii shrub communities [1S(SL)2].

DOMINANT PAG: 1H(HM) 2
CODOMINANT PAG: 1H(HL) 1
CODOMINANT PAG: 1S(SL) 2

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: C

Codominant Valley Bottom: The moderately wide, flat valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: c
CODOMINANT STREAM TYPES: B, F, E

Upland Regional Class: **Herbland 1.3**

This is the cold, dry **herbland** environment of the ICB. Soils in the alpine and high-subalpine zone are typically well-drained.

VALLEY BOTTOM TYPES

DOMINANT: (1,3) Narrow, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The narrow, flat valley bottoms are dominated by Deschamosia cespitosa and Senecio triangularis communities [1H(HM)2]. Low, wet sedge communities, including Carex scopulorum, C. aquatilis, C. simulata, and C. utriculata types [1H(HL)1] codominate with low shrub types, including Artemisia cana and Salix wolfii shrub communities [1S(SL)2].

DOMINANT PAG: 1H(HM) 2

CODOMINANT PAG: 1H(HL)1
CODOMINANT PAG: 1S(SL)2

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: C

Upland Regional Class: **Herbland 1,4**

This is the coldest, driest **herbland** environment of the ICB. Sites are wind-blasted, typically on exposed ridgelines, with little to no snow accumulation. This environment occurs only in the mountains of the central and eastern portion of the Columbia River Basin.

VALLEY BOTTOM TYPES

DOMINANT: (1,3) Narrow, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The narrow, flat valley bottoms are dominated by Deschampsia cespitosa and Senecio triangularis communities [1H(HM)2]. Low, wet sedge communities, including Carex scopulorum, C. aquatilis, C. simulata, and C. utriculata types [1H(HL)1] are codominant.

DOMINANT PAG: 1H(HM)2
CODOMINANT PAG: 1H(HL)1

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: C

Upland Regional Class: **Herbland 2,1**

This is the cool, wet **herbland** environment of the ICB. Saturated substrates are typically high in organic matter with some mineral variation. Sites are in the subalpine and montane zones.

VALLEY BOTTOM TYPES

DOMINANT: (3,3) Wide, Flat
CODOMINANT1: (2,3) Moderate Width, Flat
CODOMINANT2: (1,3) Narrow, Flat

, PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The wide, flat valley bottoms are dominated by wet Carex utriculata, C. vesicaria, and Calamagrostis canadensis herbaceous types [1H(HM)1]. Low, wet sedge types, including Carex aquatilis, C. simulata, and C. utriculata communities [1H(HL)1] codominate with taller ~~Deschampsia cespitosa~~ and Senecio triangularis types [1H(HM)2].

DOMINANT PAG: 1H(HM) 1
CODOMINANT PAG: 1H(HL) 1
CODOMINANT PAG: 1H(HM) 2

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES E, B, D

Codominant Valley Bottom1: The moderately wide, flat valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley **Bottom2**: The narrow, flat valley bottoms are dominated by Alnus incana, Salix boothii, S. drummondiana, and/or S. qeveriana shrub types with wet herbaceous **undergrowths** (e.g., Carex aquatilis, C. utriculata) [1S(ST)1]. Closed Abies lasiocarpa, Picea encelfmannii, and/or Populus tremuloides forest types with Calamagrostis canadensis undergrowth, and Abies grandis/Senecio trianquularis communities [1FC(HT)1] codominate with drier site Salix shrub types [1S(ST)3]. Carex utriculata, C. vesicaria, and/or Calamagrostis canadensis wet herbaceous types are present as inclusions [1H(HM)1].

DOMINANT PAG: 1S(ST) 1
CODOMINANT PAG: 1FC(HT) 1
CODOMINANT PAG: 1S(ST) 3
INCLUSION PAG: 1H(HM) 1

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: C

Upland Regional Class: **Herbland 2,2**

This is the cool, moist **herbland** environment of the ICB. Sites occupy the subalpine and mid-montane zones. Soils are typically well-drained.

VALLEY BOTTOM TYPES

DOMINANT: (2,3) Moderate Width, Flat
CODOMINANT1: (2,2) Moderate Width, Moderate Slope
CODOMINANT2: (1,3) Narrow, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, flat valley bottoms are dominated by Alnus incana, Salix boothii, S. drummondiana, and/or S. qeveriana shrub **types** with wet herbaceous undergrowths (e.g., Carex aquatilis, C. utriculata) [1S(ST)1]. Wet Carex utriculata, C. vesicaria,

and/or Calamagrostis canadensis herbaceous types [1H(HM)1] codominate. Closed Abies lasiocarpa, Picea engelmannii, and/or Populus tremuloides types with Calamagrostis canadensis undergrowth, and Abies grandis/Senecio triangularis communities [1FC(HT)1] are also common.

DOMINANT PAG: 1S(ST)1
CODOMINANT PAG: 1H(HM)1
CODOMINANT PAG: 1FC(HT)1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley Bottom1: The moderately wide, moderately steep valley bottoms are dominated by Alnus incana, Salix boothii, S. drummondiana, and/or S. geveriana shrub types with wet herbaceous undergrowths (e.g., Carex aquatilis, C. utriculata) [1S(ST)1]. Closed Abies lasiocarpa/Ledum glandulosum and/or A. lasiocarpa/Oplopanax horridus communities [1FC(SM)3] codominate with drier site Salix spp. shrub types with Poa pratensis and/or Rosa woodsii undergrowths [1S(ST)3].

DOMINANT PAG: 1S(ST)1
CODOMINANT PAG: 1FC(SM)3
CODOMINANT PAG: 1S(ST)3

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Codominant Valley Bottom2: The narrow, flat valley bottoms are dominated by Alnus incana, Salix boothii, S. drummondiana, and/or S. geveriana shrub types with wet herbaceous undergrowths (e.g., Carex aquatilis, C. utriculata) [1S(ST)1]. Closed Abies lasiocarpa, Picea engelmannii, and/or Populus tremuloides types with Calamagrostis canadensis undergrowth, and Abies grandis/Senecio triangularis communities [1FC(HT)1] codominate with drier site Salix spp. shrub types with Poa pratensis and/or Rosa woodsii undergrowths [1S(ST)3]. Carex utriculata, C. vesicaria, and/or Calamagrostis canadensis wet herbaceous types [1H(HM)1] are present as inclusions.

DOMINANT PAG: 1S(ST)1
CODOMINANT PAG: 1FC(HT)1
CODOMINANT PAG: 1S(ST)3
INCLUSION PAG: 1H(HM)1

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: C

Upland Regional Class: **Herbland 2,3**

This is the cool, dry **herbland** environment. Sites occupy the subalpine and montane zones of the Columbia River Basin.

VALLEY BOTTOM TYPES

DOMINANT: (1,3) Narrow, Flat
CODOMINANT1: (2,3) Moderate Width, Flat
CODOMINANT2: (1,2) Narrow, Moderate Slope

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The narrow, flat valley bottoms are dominated by wet Alnus incana, Salix boothii, S. drummondiana, and/or S. severiana shrub types with herbaceous undergrowths (e.g., Carex aquatilis, C. utriculata) [1S(ST)1]. Also present are closed Abies lasiocarpa/Rhododendron albiflorum, A. amabilis/Oplopanax horridus, Thuia plicata/O. horridus, and Tsusa heterophylla/O. horridus forest types [1FC(SM)2]. Potentilla fruticosa/Poa nratensis and Rosa woodsii shrub types [1S(SM)3] are common; Deschampsia cesoitosa and Senecio triangularis herbaceous types are present as inclusions [1H(HM)2].

DOMINANT PAG: 1S(ST)1
CODOMINANT PAG: 1FC(SM)2
CODOMINANT PAG: 1S(SM)3
INCLUSION PAG: 1H(HM)2

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: C

Codominant Valley Bottom1: The moderately wide, flat valley bottoms are dominated by Alnus incana, Salix boothii, S. drummondiana, and/or S. severiana shrub types with wet herbaceous undergrowths (e.g., Carex aquatilis, C. utriculata) [1S(ST)1]. Drier site Salix spp. shrub types with Poa nratensis and/or Rosa woodsii undergrowths [1S(ST)3] codominate with open Populus tremuloides/Symphoricarpos SDD. forest types [1FO(SM)3].

DOMINANT PAG: 1S(ST)1
CODOMINANT PAG: 1S(ST)3
CODOMINANT PAG: 1FO(SM)3

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley Bottom2: The narrow, moderately steep valley bottoms are dominated by Alnus incana, Salix boothii, S. drummondiana, and/or S. severiana shrub types with wet herbaceous undergrowths (e.g., Carex aquatilis, C. utriculata) [1S(ST)1]. Potentilla fruticosa/Poa nratensis and Rosa woodsii shrub types [1S(SM)3] codominate with closed Abies lasiocarpa/Rhododendron albiflorum, A. amabilis/Oplopanax horridus, Thuia plicata/O. horridus, and/or Tsusa heterophylla/O. horridus forest types [1FC(SM)2].

DOMINANT PAG: 1S(ST)1
CODOMINANT PAG: 1S(SM)3
CODOMINANT PAG: 1FC(SM)2

DOMINANT STREAM TYPE: A
CODOMINANT STREAM TYPE: B

Upland Regional Class: **Herbland 2,4**

This is the cool, very dry **herbland** environment. Sites are relatively arid, well-drained, unstable, high-subalpine and low-alpine habitats. This environment only occurs in the mountain ranges of the Challis **Volcanics**, Beaverhead Mountains, and Belt Mountains Sections of the Columbia River Basin.

VALLEY BOTTOM TYPES

DOMINANT: (1,3) Narrow, Flat
CODOMINANT1: (2,3) Moderate Width, Flat
CODOMINANT2: (1,2) Narrow, Moderate Slope

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The narrow, flat valley bottoms are dominated by Alnus incana, Salix boothii, S. drummondiana, and/or S. geveriana shrub types with wet herbaceous undergrowths (e.g., Carex aquatilis, C. utriculata) [1S(ST)1]. Closed Abies lasiocarpa/Rhododendron albiflorum, A. amabilis/Oplopanax horridus, Thuja plicata/O. horridus, and/or Tsuga heterophylla/O. horridus forest types [1FC(SM)2] codominate with Potentilla fruticosa/Poa pratensis and Rosa woodsii shrub types [1S(SM)3]. Deschamnsia cespitosa and Senecio triangularis herbaceous types are present as inclusions [1H(HM)2].

DOMINANT PAG: 1S(ST)1
CODOMINANT PAG: 1FC(SM)2
CODOMINANT PAG: 1S(SM)3
INCLUSION PAG: 1H(HM)2

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: C

Codominant Valley Bottom1: The moderately wide, flat valley bottoms are dominated by Alnus incana, Salix boothii, S. drummondiana, and/or S. geveriana shrub types with wet herbaceous undergrowths (e.g., Carex aquatilis, C. utriculata) [1S(ST)1]. Drier site Salix spp. shrub types with Poa pratensis and/or Rosa woodsii undergrowths [1S(ST)3] codominate with open Populus tremuloides/Symphoricarpos spp. types [1FO(SM)3].

DOMINANT PAG: 1S(ST)1
CODOMINANT PAG: 1S(ST)3
CODOMINANT PAG: 1FO(SM)3

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley Bottom2: The narrow, moderately steep valley bottoms are dominated by Alnus incana, Salix boothii, S. drummondiana,

and/or S. geveriana shrub types with wet herbaceous undergrowths (e.g., Carex aquatilis, C. utriculata) [1S(ST)1] . Potentilla fruticosa/Poa pratensis and Rosa woodsii shrub types [1S(SM)3] codominate with closed Abies lasiocarpa/Rhododendron albiflorum, A. amabilis/Oplopanax horridus, Thuja plicata/O. horridus, and/or Tsusa heterophylla/O. horridus forest types [1FC(SM)2] .

DOMINANT PAG: 1S(ST)1
CODOMINANT PAG: 1S(SM)3
CODOMINANT PAG: 1FC(SM)2

DOMINANT STREAM TYPE: A
CODOMINANT STREAM TYPE: B

Upland Regional Class: **Herbland 3,1**

This is the warm, wet **herbland** environment of the ICB. Sites occupy the lower montane zone and are typically wetlands. They occur on saturated substrates typically with standing water.

VALLEY BOTTOM TYPES

DOMINANT: (3,3) Wide, Flat
CODOMINANT: (2,3) Moderate Width, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The wide, flat valley bottoms are dominated by Deschampsia cespitosa and D. cespitosa-Carex spp. herbaceous types [3H(HM)3] . Drier sedge communities dominated by Carex microotera and C. douglasii, and Poa pratensis types [3H(HL)3] codominate with wetter Carex nebrascensis, C. simulata, and Juncus balticus herbaceous communities [3H(HL)2] .

DOMINANT PAG: 3H(HM)3
CODOMINANT PAG: 3H(HL)3
CODOMINANT PAG: 3H(HL)2

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: E,B,D

Codominant Valley **Bottom2**: The moderately wide, flat valley bottoms are characterized by the same riparian PAG's as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B,F,E

Upland Regional Class: **Herbland 3,2**

This is the warm, moist **herbland** environment of the ICB. Sites occupy the lower montane zone as well as below lower

timberline. This is a minor habitat in the Columbia River Basin, occurring only in the Northwestern Basin and Range Section in Nevada and Oregon.

VALLEY BOTTOM TYPES

DOMINANT: (3,3) Wide, Flat
CODOMINANT: (2,3) Moderate Width, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The wide, flat valley bottoms are dominated by Poa oratensis and Carex microptera herbaceous types [3H(HL)3]. Tall, wet Typha latifolia, Scirpus spp. and/or Phalaris arundinacea marsh types are also present [3H(HT)1].

DOMINANT PAG: 3H(HL)3
CODOMINANT PAG: 3H(HT)1

Codominant Valley Bottom: The moderately wide, flat valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B,F,E

Upland Regional Class: **Herbland 3,3**

This is the warm, dry **herbland** environment of the ICB. It is diverse, and is represented by steep, canyon or mountainous terrain, gently-rolling **Palouse** grasslands, as well as depositional areas in the eastern sections of the Columbia River Basin.

VALLEY BOTTOM TYPES

DOMINANT: (2,3) Moderate Width, Flat
CODOMINANT1: (1,3) Narrow, Flat
CODOMINANT2: (1,2) Narrow, Moderate Slope

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The moderately wide, flat valley-bottoms are dominated by a large and diverse group of tall, wet shrublands. Alnus incana, Betula occidentalis, Comus stolonifera, Crataegus douglasii; and/or Salix boothii, S. exigua, and/or S. geveryana types with wet herbaceous undergrowths are common [3S(ST)1]. Salix spp. shrub types with drier undergrowths (e.g., Ribes spp., Rosa woodsii, Poa nratensis) [3S(ST)3] codominate with tall Elymus cinereus herbaceous types [3H(HT)3].

DOMINANT PAG: 3S(ST)1
CODOMINANT PAG: 3S(ST)3

CODOMINANT PAG: 3H(HT) 3

DOMINANT. STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley Bottom1: The narrow, flat valley bottoms are characterized by the same riparian PAG's as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: C

Codominant Valley Bottom2: The narrow, moderately steep valley bottoms are dominated by a large and diverse group of tall, wet shrublands. Alnus incana, Betula occidentalis, Cornus stolonifera, Crataegus douglasii; and/or Salix boothii, S. exigua, and/or S. geveriana types with wet herbaceous undergrowths are common [3S(ST)1]. Salix spp. shrub types with drier undergrowths (e.g., Ribes spp. Rosa woodsii, Poa pratensis) [3S(ST)3] are also present.

DOMINANT PAG: 3S(ST) 1
CODOMINANT PAG: 3S(ST) 3

DOMINANT STREAM TYPE: A
CODOMINANT STREAM TYPE: B

Upland Regional Class: **Herbland 3,4**

This is the warm, very dry **herbland** environment. Represented in the lower montane zone as well as below the lower treeline, it includes scablands on volcanic surfaces in the western sections of the ICB, and alluvial fans in high mountain valleys of the Beaverhead Mountains and the Challis **Volcanics** Sections. Since it occurs in two geographically separated portions of the ICB, two dominant and codominant valley bottom types are presented below.

VALLEY BOTTOM TYPES

DOMINANT1: (2,3) Moderate Width, Flat
DOMINANT2: (1,1) Narrow, Steep
CODOMINANT1: (1,3) Narrow, Flat
CODOMINANT2: (1,2) Narrow, Moderate Slope

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom1: The moderate width, flat valley bottoms are dominated by low, dry Artemisia cana/dry sraminoid shrub types [3S(SL)3]. Moister Artemisia cana/Carex nebrascensis-Poa fendleriana, A. cana-A. tridentata/Poa fendleriana, and A. cana/Elymus caninus-Poa secunda shrub communities [3S(SL)1] codominate with Carex nebrascensis, Eleocharis nalustris, Juncus balticus, and/or Leymus triticoides herbaceous types [3H(HL)2].

DOMINANT PAG: 3s (SL) 3
CODOMINANT PAG: 3s (SL) 1
CODOMINANT PAG: 3H (HL) 2

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Dominant Valley Bottom2: The narrow, steep valley bottoms are dominated by warm, closed Populus angustifolia, P. balsamifera, and/or P. tremuloides forests with tall, wet site shrub understories such as Betula occidentalis and/or Cornus stolonifera [3FC(ST)1]. Drier Alnus rhombifolia, Acer negundo, and Populus sdd. closed forests [3FC(ST)3] codominate with Alnus incana, Betula occidentalis, and/or Salix sdd. shrub types with Poa nratensis, Rosa woodsii, and/or Symphoricarpos albus in the understory [3S(ST)3]. Allenrolfea occidentalis shrub types are also common, although no plot data were available on these communities.

DOMINANT PAG: 3FC (ST) 1
CODOMINANT PAG: 3FC (ST) 3
CODOMINANT PAG: 3S (ST) 3

DOMINANT STREAM TYPE: A

Codominant Valley Bottom1: The narrow, flat valley bottoms are characterized by the same riparian PAG's as dominant valley bottom1. See above description.

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: A

Codominant Valley Bottom2: The narrow, moderately steep valley bottoms are characterized by the same riparian PAG's as dominant valley bottom2. See above description.

DOMINANT STREAM TYPE: A
CODOMINANT STREAM TYPE: B

Upland Regional Class: Herbland 4,1

This is the hot, wet herbland environment of the ICB. Sites contain wetland vegetation occurring at the lowest, hot elevations of the Columbia River Basin.

VALLEY BOTTOM TYPES

DOMINANT: (3,3) Wide, Flat
CODOMINANT1: (2,3) Moderate Width, Flat
CODOMINANT2: (1,3) Narrow, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The wide, flat valley bottoms are dominated by Typha latifolia, Scirpus acutus, S. validus, and/or Phalaris arundinacea marsh types [3H(HT)1]. Carex simulata, C. lanuginosa, and Eleocharis ssp. herbaceous types [3H(HL)1] codominate with Carex nebrascensis and Juncus balticus communities [3H(HL)2].

DOMINANT PAG: 3H(HT)1
CODOMINANT PAG: 3H(HL)1
CODOMINANT PAG: 3H(HL)2

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: E,B,D

Codominant Valley Bottom1: The moderately wide, flat valley bottoms are dominated by Typha latifolia, Scirpus acutus, S. validus, and Phalaris arundinacea marsh types [3H(HT)1]. Carex utriculata, Glyceria borealis, and Scirpus ssp. wet herbaceous types [3H(HM)1] codominate with Carex nebrascensis and Juncus balticus communities [3H(HL)2].

DOMINANT PAG: 3H(HT)1
CODOMINANT PAG: 3H(HM)1
CODOMINANT PAG: 3H(HL)2

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: D,F,E

Codominant Valley Bottom2: The narrow, flat valley bottoms are dominated by Carex utriculata, Glyceria borealis, and Scirpus ssp. wet herbaceous types [3H(HM)1]. Typha latifolia, Scirpus acutus, S. validus, and Phalaris arundinacea marsh types [3H(HT)1] codominate with Carex nebrascensis and Juncus balticus communities [3H(HL)2].

DOMINANT PAG: 3H(HM)1
CODOMINANT PAG: 3H(HT)1
CODOMINANT PAG: 3H(HL)2

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: C

Upland Regional Class: **Herbland 4,2**

This is the hot, moist **herbland** environment of the ICB. Sites are generally low elevation bottomlands with deep soils that have high water holding capacities.

VALLEY BOTTOM TYPES

DOMINANT: (3,3) Wide, Flat
CODOMINANT1: (2,3) Moderate Width, Flat
CODOMINANT2: (1,3) Narrow, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The wide, flat valley bottoms are dominated by Juncus balticus, Carex douglasii, and/or Distichlis spicata herbaceous types [4H(HL)3]. Tall Elymus cinereus bottomland types [4H(HT)3] codominate with Typha latifolia, Scirpus acutus, S. validus, and/or Phalaris arundinacea marsh types [3H(HT)1].

DOMINANT PAG: 4H(HL)3
CODOMINANT PAG: 4H(HT)3
CODOMINANT PAG: 3H(HT)1

Codominant Valley Bottom1: The moderately wide, flat valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley Bottom2: The narrow, flat valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: B
CODOMINANT **STREAM** TYPE: C

Upland Regional Class: **Herbland 4,3**

This is the hot, dry **herbland** environment of the ICB. The low elevation sites include alkaline bottomlands.

VALLEY BOTTOM TYPES

DOMINANT: (3,3) Wide, Flat
CODOMINANT1: (2,3) Moderate Width, Flat
CODOMINANT2: (1,3) Narrow, Flat

PLANT ASSOCIATION GROUPS (PAG) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The wide, flat valley bottoms are dominated by Juncus balticus, Carex douglasii, and/or Distichlis spicata herbaceous types [4H(HL)3]. Tall Elymus cinereus bottomland types [4H(HT)3] codominate with Typha latifolia, Scirpus acutus, S. validus, and Phalaris arundinacea marsh types [3H(HT)1].

DOMINANT PAG: 4H(HL)3
CODOMINANT PAG: 4H(HT)3
CODOMINANT PAG: 3H(HT)1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: E, B, D

Codominant Valley Bottom1: The moderately wide, flat valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley **Bottom2**: The narrow, flat valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: C

Upland Regional Class: **Herbland 4,4**

This is the hottest and driest **herbland** environment of the **ICB**. Sites are well-drained on sandy or gravelly substrates. This habitat is represented only in the Northwest Basin and Range, Lahontan Basin and Range, Beaverhead Mountains, and Challis **Volcanics** Sections.

VALLEY BOTTOM TYPES

DOMINANT: (3,3) Wide, Flat
CODOMINANT1: (2,3) Moderate Width, Flat
CODOMINANT2: (1,3) Narrow, Flat

PLANT ASSOCIATION GROUPS (**PAG**) WITHIN VALLEY BOTTOM TYPES

Dominant Valley Bottom: The wide, flat valley bottoms are dominated by Juncus balticus, Carex douglasii, and/or Distichlis spicata herbaceous types [4H(HL)3]. Tall ~~Elymus cinereus~~ bottomland types [4H(HT)3] codominate with Typha latifolia, Scirpus acutus, S. validus, and/or Phalaris arundinacea marsh types [3H(HT)1].

DOMINANT PAG: 4H(HL)3
CODOMINANT PAG: 4H(HT)3
CODOMINANT PAG: 3H(HT)1

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: E, B, D

Codominant Valley Bottom1: The moderately wide, flat valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: C
CODOMINANT STREAM TYPES: B, F, E

Codominant Valley **Bottom2**: The narrow, flat valley bottoms are characterized by the same riparian **PAG's** as the dominant valley bottom. See above description.

DOMINANT STREAM TYPE: B
CODOMINANT STREAM TYPE: C

IV. CONCLUSIONS

Since the Columbia River Basin (**ICB**) covers a large geographic area and is diverse floristically, it would be logistically difficult to map riparian areas at this coarse scale. Since plot data were limited, conducting a workshop to associate riparian types to valley bottom types within the upland PVT environments was more efficient. Although some types may not be fully represented, the knowledge **of field** ecologists greatly reduced this risk. The classification incorporates summary data that were collected in the field; they were used to generate a plant association within a given area. Therefore, all the information remains intact within each plant association group through database linkages.

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