Information On File as Cited in the Terrestrial Ecology Assessment Chapter, Science Integration Team Report, Interior Columbia Basin Ecosystem Management Project

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• * for REVIEW DRAFT • *

Overall Summary -- Terrestrial Ecology Assessment

Trends in Vegetation Cover Types and Structural Stages

Summary of results: Native grasslands (Fescue-bunchgrass, ***Agropyron*** bunchgrass), shrublands (big sagebrush), and old single-stratum and multi-strata stages of many forest types, especially lower montane ponderosa pine forests, have declined since historic times. Declines are on both federal and non-federal lands, with most decline on non-federal land. Individual species most associated with these types are many and are listed in tables. Vertebrate **"decreasers"** of old-growth' forests included primary cavity **excavators** and species with large home ranges.

Assessment of Species Occurrence and Listing Status

Summary of results: Over 35,000 species of macro-organisms are estimated to occur ***in*** the assessment **area** and 14,439 species are known to occur. Micro-organisms are little known and probably tally at least several hundred thousand species. They are critical to ecosystem health and function. **We** evaluated 11,422 species and explicitly included 1,339 individual species and 143 species groups in a Species-Environment Relations Model. This rich biodiversity is because of the wide variety of habitats, topographic conditions, and prehistoric events within the study area. Some 268 taxa (species, subspecies, or fish stocks) have Federal listing status, including 208 Candidate 2, 33 Candidate 1, 16 endangered, and 11 threatened taxa. FS and BLM list 537 species as sensitive. The Science Integration Team lists 178 species as of particular interest by American Indian tribes. Experts' knowledge levels were greater for plants than vertebrates and greater for vertebrates than invertebrates, which are poorly studied.

Fungi

Summary of results: The fungal flora is poorly known, including effects of management activities. Some species are important to recreational and commercial gatherers. Many kinds of fungi occur, including species with narrow distributions, that fruit after fire, that fruit in dung, and that are mychorrhizal and saprophytic and thus that depend on host plants. Fungi conservation can include protection of type localities in mycological preserves and further study of biology and ecology of species.

Lichens

Summary of ***results:*** Lichens play key ecological roles in ***ecosystems,*** including contributing mass and nutrients to litter and duff, increasing canopy and soil moisture holding capacity, fixing atmospheric nitrogen, serving as food source for American Indians and animals, and acting as bioindicators for air quality. Lichens are part of microbiotic crusts in rangelands, which protect soils but which are susceptible ***to*** damage from livestock grazing. One lichen is listed as **a** candidate species. The 736 lichen species were divided into 40 functional groups based on ecological relationships. The groups occur on four main substrates: dead organic matter, corticate and decorticate wood, rock, and soil. Forest conservation should include providing clumps of old trees and uneven-aged stands for their legacy of lichens. Lichens are major components of native rangelands and provide critical soil functions, but

have been threatened from exotic grasses, increased fires, conversion of rangelands, and livestock trampling. Basic lichen surveys and studies of management effects are needed.

Bryophytes

Summary of results: Most bryophytes have wide artic-alpine and boreal distributions. Others are coastal and north Pacific, or occur in arid environments as part of soil crusts. Three species are endemic. Eleven ecological groups of bryophytes ***were*** identified based on substrates. Changes in water quality affect aquatic submered and wet rock species. Opening of forest canopies affects mycorrhizal species associated with decaying wood and forest humus and duff. Collection may affect some of the humus and duff species. Other species in bogs, fens, and other environments are poorly studied. Dry soil species are critical to soil protection. Many species, at least 268, may be regionally rare, but need inventory to better determine status, especially those in arid habitats, on calcareous rocks, mineralized deposits, peatlands, floodplains, geothermal areas, and isolated canyons. Bryophte conservation can include training for identification, including bryophytes in field vegetation plot data, and inventory of bryphytes in protected areas.

Vascular Plants

Summary of results: Vascular plants number at least 8000 species, which include at least 154 local or regional endemics. The diversity is from complex biophysical environments along gradients of elevation, bedrock and soils, temperature, and moisture. Native plant communities have declined significantly, prompting concerns for rare species and rare plant communities. Of particular ***concern*** are communities affected by grazing, introduction of exotic species, and timber harvesting; examples are bunchgrass grasslands of the Palouse region and low elevation cedar/hemlock old-growth forests. Some 87 plant taxa are of tribal concern for sustained harvestability. Conservation measures can include monitoring rare species and plant communities; off-site collection of pollen, seeds, and rare plants; and protection of key areas of high species rarity, endemism, and diversity.

Invertebrates

Summary of results: No species are listed as threatened, endangered, ***or*** Candidate 1; 38 are Candidate 2. ***FS*** lists ***none*** as sensitive; BLM lists 25. Some 95 terrestrial mollusks need conservation attention singly or as groups; many are confined to calcareous substrates. Invertebrates are critical **for** many ecosystem functions including detritovory and nutrient cycling. We identify rare and endemic species that bear further watching. Functional roles of invertebrates include: detritovory and nutrient cycling; maintaining soil structure, chemistry, and productivity; wood decomposition; herbivory; pathogenic effects on other organisms as well as control of disease-causing organisms; Invertebrates can make excellent bioindicators of soil and vegetation health. Most arthropods are poorly known; many are unnamed. Arthropod predators may control other invertebrate populations including some defoliator pests, and require a mix of habitat types, down wood, and vegetation substrates. Invertebrate pollinators are critical to maintaining the flora. In grasslands and forests, species groups, particularly herbivores, are important links in food webs and affect

vegetation succession; a few are agricultural or forestry pests. Fire and changes in soil chemistry, especially in range and forest conditions altered from historic structures, directly affect invertebrates. Other management concerns are mechanical and livestock compaction and mixing of soils. Other management activities potentially harmful to desirable invertebrates include overgrazing, some recreation, loss of sphagnum bogs, exotic plants or arthropods, and pesticides. Management should focus on providing a diversity of habitats, maintaining soil structure and soil chemistry, and preventing or eradicating exotics.

Vertebrates

Summary of results: Amphibians ***require*** water or moist environments, are susceptible to exotic species, and correlate more with substrates such as down wood or talus than with vegetation types 'or stages. Amphibians transfer nutrients from aquatic to terrestrial environments, are prey for predators, and contribute major biomass in forest systems. Studies are needed on effects on amphibians from water quality changes, canopy closure, pesticides, livestock grazing, eutrophication, and ultraviolet radiation: and on dispersal requirements and distribution. Reptiles correlate with elevation, aspect, and substrate more than with vegetation. Reptiles are susceptible to dams, off-road vehicles, loss of wetlands, livestock grazing, and fire suppression. Survey techniques for reptiles are needed. Birds are susceptible to management-induced changes in vegetation, especially historic declines in old single-stratum interior ponderosa pine forests and ***Agropyron*** bunchgrass. Columbian sharp-tailed grouse have particularly declined. Neotropical migrants require conservation or restoration of riparian, old-growth forest, shrubsteppe, grassland, and juniper habitats. Mammals with population or habitat declines include some bats and predators. Some 47 vertebrates are listed as endangered, threatened, or Candidate 2; status of each is discussed. Few locations still contain all top predators.

General Trends of Species Ecological Characteristics

Summary of results: Probably no vertebrates have become regionally extinct in historic times; information on other taxa is lacking. Small-bodied, less widely-vagile species may be at greater risk of declines or local extirpations. Edges of ranges are important for species conservation. A Species-Environment Relations Model annotates species closely associated with environmental conditions affected by management, including forest canopy, mistletoe brooms,' dead parts of live trees, trees with exfoliated bark, snags, down wood, litter and duff, fire processes and insect outbreaks, recreation, roads, and trails. This information is useful for management to predict potential effects of activities and identify specific conditions for conservation of species functional groups.

Rangeland Ecology and Grazing Management

Summary of results: Grazing and herbivory are important historic processes disrupted by elimination of paleofauna and wide introduction of livestock. Removal of livestock from riparian, true grasslands, and open conifer-grasslands would aid restoration of native habitat conditions, soil crusts, and riparian-wetlands. Decreased fire occurrence has led to conifer encroachment and increased big sagebrush and shrub density, and increased fires with annual grasses has led to declines in native grasses. Exotics, including cheatgrass, have played

ecological havoc on native grassland systems. Juniper has expanded from fire suppression, reducing Mountain Big Sagebrush and adversely affecting native vegetation communities and soil processes; prescribed fire can slow juniper expansion. Soil (microbiotic) crusts play critical roles in arid land ecology and have been significantly and adversely affected by grazing practices. Riparian grazing has damaged many systems, but can be restored with livestock exclusion or control of grazing season and intensity. Noxious weeds are an increasing problem on rangelands; prevention of new introductions is more cost-effective than eradication. Range degredation has prompted seeding with nonnative forage grasses, which have seriously affected native biodiversity. We identify sundry indicators to disturbance stress for rangelands.

Key Ecological Functions of Species and Processes of Ecological Subsystems

Summary of results: Major ecological functions of species are summarized from the Species-Environment Model data bases. Understanding functions are critical to crafting appropriate ecosystem management guidelines; the fate of individual species is only one facet of terrestrial ecology conservation. Major ecological functions addressed include: species contributing to major biomass; herbivory; nutrient cycling relations; interspecies relations; soil productivity; wood decomposition; and water quality. We advocate using such key ecological functional groups of species rather than identifying individual keystone species; and avoiding use of ecological equivalents among species, as each species provides unique ecological services.

Endemism, Biodiversity, and Natural Areas

Summary of results: Twelve "hot spot" areas with unusually high levels of plant and animal species endemism, rarity, and biodiversity were identified; additional areas were identified separately for plants, invertebrates, and vertebrates. Key areas include southwestern Oregon, Snake River, Columbia River Gorge, and desert steppe in central and southern Washington. Natural areas on federal lands total 11.72 million ha in 26 land allocation categories. Size of natural areas might be suitable for supporting at least small populations of at least 70 percent of vertebrate species.

Biogeography

Summary of results: Broad-scale biogeography of species is poorly studied in the assessment area. We identified some species closely associated with some of the 9 landform classes. Species such as boreal owl appear as disjunct populations because of breaks in distributions of suitable environments or incomplete sampling; smaller and more isolated disjunct populations are likely more susceptible to local declines ***or*** extinctions. Locally endemic species or subspecies often are highly habitat-specific, such as Coeur d'Alene salamander. Distributions of local endemics can result from contracted ranges from habitat loss or extirpations, overall scarcity of suitable environments, or other fApparent peripheral, disjunct, and scattered distributions of some species may be an artifact of the location and size of the area of interest. Most Ecological Report Unit had at least some unique species, although many species overlapped several Units. Some species are closely associated with single biophysical factors, although many species are likely correlated with multiple factors.

CONCLUSIONS

Historic and current conditions:
- habitats most in decline:
  - late-successional forests
  - old, open ponderosa pine forests
  - native closed shrublands (e.g., big sagebrush)
  - native grasslands (Fescue-bunchgrass, ***Agropyron*** bunchgrass)
- declines on both non-federal and federal lands; non-federal more extreme
- major concerns with rangeland degredation, and exotic plants

Terrestrial biodiversity:
- over 35,000 species of macro-organisms
- ecology and trends of most are unknown
- 17 taxa T&E, 219 C1&C2, 537 FS or BLM sensitive (excluding fish)
- assume USFWS T&E recovery process will provide for those species

To meet goals of ecological integrity:
- **For** conservation of biodiversity:
  - some realignment of natural areas to better represent ecosystems and provide for rare and endemic species
  - conserve at least 12 "hot spots" of species rarity, endemism, and richness
  - provide for a full array of historic vegetation conditions
- For long-term productivity of terrestrial ecosystems:
  - realize ecological role of, study, and provide for, soil micro-organisms
  - provide for unique assemblages of species and all ecological functions
- For maintaining long-term evolutionary potential:
  - provide for all populations of species with disjunct distributions
  - provide for locally and regionally endemic species, and locally endemic subspecies
  - protect type localities for rare plants
  - in-field and off-site rare plant conservation measures

Need much basic scientific information
- inventories of many fungi, lichens, bryophytes, rare plants
- monitoring of selected rare plant communities
- basic taxonomy (find, name species) of invertebrates
- basic ecology, biology, and ecological roles of many plants, most invertebrates

Use early warning indicators of ecosystem health
- soil crusts, microorganisms, invertebrate herbivores, fungi, lichens, bryophytes

Numbers of taxa (species, subspecies, fish stocks) by Federal listing status, extirpated, and of special interest to American Indian tribes.

Taxonomic classes: NV = nonvascular plants; P = vascular plants; I = invertebrates; F = fish; A = amphibians; R = reptiles; B = birds; M = mammals.

Listing status classes: USFWS = USDI Fish and Wildlife Service; FS = USDA Forest Service; BLM = USDI Bureau of Land Management; C1 = Candidate 1; C2 = Candidate 2; THR = threatened; END = endangered; FPT = Federally proposed threatened; FPE = Federally proposed endangered; FS-S = Forest Service sensitive (in at least one state within the assessment area); BLM-S = Bureau of Land Management sensitive (in at least one state within the assessment area); Joint FS/BLM-S = same species listed by both FS and BLM as sensitive; TRIBAL = species identified by the CRB Science Integration Team as of particular interest to American Indian tribes.

	USFWS						FS & BLM				
Class	C1	C2	THR	END	FPT	FPE	FS-S	BLM-S	Joint[1] FS/BLM-S	Total[2] FS/BLM-S	TRIBAL
NV		1					3	10	1	12	4
P	31	111	1	3		1	371	113	45	439	87
I		38	1	4				25		25	16
F	2	19	5	5			[...see Aquatic/Riparian chapter...]				
A		6					2	5	2	5	
R		2					1	5		6	2
B		14	3	2			22	23	12	33	34
M		17	1	2			11	12	6	17	35
TOTAL	32	208	11	16	0	1	410	193	66	537	178
			268								

[1]Joint FS/BLM-S refers to the same species that are listed by both FS and BLM as sensitive.

[2]Total FS/BLM-S refers to all species listed by either FS or BLM as sensitive.

Assessment of Species Rarity, Endemism, and Biodiversity Hot Spots

Figure, Distribution of hot spots of species rarity and endemism and centers of biodiversity, with Ecological Reporting Unit. These are locations that are particularly rich among plants, invertebrates, and vertebrates.

Appendix xx. Historical and current habitat area for select vascular and non-vascular plant species and groups in the Interior Columbia River Basin based on vegetation types mapped from satellite imagery at a 1-km² pixel resolution.

Type	Species code	Scientific name	Common Name	Historic habitat (ha)	Current habitat (ha)	Change from historic (%)
Bryophyte group	DECWOO	Decayed wood bryophyte		6,380,000	10,748,000	68.5
Bryophyte group	EPIPHY	Epiphytic bryophyte		6,380,000	10,748,000	68.5
Bryophyte group	HUMDUF	Humus duff bryophyte		7,427,700	10,794,200	45.3
Bryophyte group	ROCCAL	Rock calcareous bryophyte		55,294,500	44,445,700	-19.6
Bryophyte group	ROCOTH	Rock other bryophyte		57,677,500	57,582,000	-0.2
Bryophyte group	ROCWET	Rock wet bryophyte		261,400	184,800	-29.3
Bryophyte group	SOIALK	Soil alkaline bryophyte		1,293,900	856,700	-33.8
Bryophyte group	SOIDRY	Soil dry bryophyte		57,677,500	57,582,000	-0.2
Bryophyte group	SOIWET	Soil wet bryophyte		55,114,400	41,665,200	-24.4
Lichen sp.	OCEFRU	Oceanic fruticose	Oceanic fruticose	7,247,900	9,464,000	30.6
Lichen sp.	TEXSAJ	*Texosporium sancti-jacobi*	Wovenspored lichens	14,342,500	9,604,000	-33.0
Lichen group	ASPSPE	Aspen specialist lichens	Aspen specialist	563,100	1,046,200	85.8
Lichen group	CALIND	Calcareous indicator lichens	Calcareous rock indicators	57,416,100	57,397,200	0.0
Lichen group	CALSTE	Calcareous steppe indicator lichens	Calcareous steppe indicators	33,212,100	32,789,000	-1.3
Lichen group	CHASNA	Charred snag lichens	Charred snag lichens	9,577,900	13,681,700	42.8
Lichen group	EXCNIT	Excess nitrogen indicator lichens	Excess nitrogen indicators	57,416,100	57,397,200	0.0
Lichen group	FENPOS	Fencepost lichens	Fencepost lichens	31,090,500	29,971,500	-3.6
Lichen group	FORAGE	Forage lichens	Forage	24,744,500	25,952,300	4.9
Lichen group	FRUTRE	Fruticose tree lichens	Fruticose tree lichens	24,744,500	25,952,300	4.9
Lichen group	LEALIC	Leaf lichens	Leaf lichens	24,744,500	25,952,300	4.9
Lichen group	METRIC	Metal rich indicator lichens	Metal rich indicators	55,294,500	54,579,700	-1.3
Lichen group	MOSDIT	Moss and ditritus binders lichens	Moss and ditritus binders	55,294,500	44,445,700	-19.6
Lichen group	N-FIXE	N-fixing epiphytes lichens	N-fixing epiphytes	24,744,500	25,952,300	4.9
Lichen group	N-FIXR	N-fixing riparian lichens	N-fixing riparian	24,744,500	25,952,300	4.9

Lichen group	NFIXRO	N-fixing rock lichens	N-fixing rock lichens	55,294,500	54,579,700	-1.3
Lichen group	NFIXSO	N-fixing soil lichens	N-fixing soil lichens	57,416,100	47,263,200	-17.7
Lichen group	OCEFOR	Oceanic forage lichens	Oceanic forage lichens	7,247,900	9,464,000	30.6
Lichen group	OCELEA	Oceanic leaf lichens	Oceanic leaf lichens	7,247,900	9,464,000	30.6
Lichen group	OCELOG	Oceanic log lichens	Oceanic log lichens	24,744,500	25,952,300	4.9
Lichen group	OCETRE	Oceanic tree crust lichens	Oceanic tree crusts	7,340,700	9,821,700	33.8
Lichen group	PINLIC	Pin lichens	Pin lichens	24,744,500	25,952,300	4.9
Lichen group	PIOSOI	Pioneer soil stabilizers lichens	Pioneer soil stabilizers	57,416,100	57,397,200	0.0
Lichen group	RIPARI	Riparian lichens	Riparian	24,744,500	25,952,300	4.9
Lichen group	ROCCRU	Rock crusts lichens	Rock crusts	55,294,500	54,579,700	-1.3
Lichen group	ROCMAC	Rock macro lichens	Rock macrolichens	57,416,100	57,397,200	0.0
Lichen group	ROTLOG	Rotten log and tree base lichens	Rotten log and tree base	24,744,500	25,952,300	4.9
Lichen group	SEEPAG	Seepage lichens	Seepage rock lichens	55,294,500	44,445,700	-19.6
Lichen group	SHELED	Sheltered ledges and overhangs lichens	Sheltered ledges and overhangs	55,294,500	44,445,700	-19.6
Lichen group	SOILIC	Soil lichens	Soil lichens	31,090,500	19,837,500	-36.2
Lichen group	STESOI	Steppe soil crust lichens	Steppe soil crusts	33,756,600	33,074,200	-2.0
Lichen group	TRECRU	Tree crusts	Tree crust lichens	24,744,500	25,952,300	4.9
Lichen group	URBPOL	Urban pollution-tolerant	Urban pollution tolerant lichens	57,416,100	57,397,200	0.0
Lichen group	VAGGRO	Vagrant ground lichens	Vagrant ground lichens	30,426,200	18,671,800	-38.6
Plant sp.	ALLAAS	***Allitrmaaseae***	Aase's onion	14,521,600	9,722,400	-33.0
Plant sp.	ALLANC	***Allium anceps***	Two-headed onion	540,500	1,344,100	148.7
Plant sp.	ALLBIS	***Alliumbisceptrum***		26,897,100	24,195,500	-10.0
Plant sp.	ALLCON	***Alliumconstrictum***	Douglas constricted onion	1,065,200	1,111,000	4.3
Plant sp.	ALLDIC	***Allium dictuon***		20,415,900	13,323,000	-34.7
Plant sp.	ALLDIC	***Allitrm dictuon***	Blue mountain onion	20,415,900	13,323,000	-34.7
Plant sp.	ALLMAD	***Allium madidtrm***	Swamp onion	7,967,500	5,892,600	-26.0
Plant sp.	ALLNEV	***Allium nevii***		7,967,500	16,026,600	101.1

Plant sp.	ALLPUN	***Allium puncrum***		14,342,500	9,604,000	-33.0
Plant sp.	ALLROB	***Allium robinsonii***	Robinson's onion	269,700	13,793,000	5014.2
Plant sp.	ALLTOP	***Allium tolmiei var. Persimile***	Tolmie's onion	9,330,800	8,881,100	-4.8
Plant sp.	ANTARO	*Antennaria aromatica*		89,600	89,400	-0.2
Plant sp.	ARAFEC	*Arabis fecunda*	Sapphire rockcress	39,311,100	26,124,500	-33.5
Plant sp.	ARAFLC	***Arnbis falcifructa***		14,342,500	9,604,000	-33.0
Plant sp.	ARTCAW	Artemisia campestris var. Wormskioldii	Northern wormwood	179,100	118,400	-33.9
Plant sp.	ARTLUE	***Arremisia. ludoviciana ssp. Estesii***	Estes' artemisia	14,751,800	9,764,000	-33.8
Plant sp.	ASTANS	*Astragalus* ***anserinus***	Goose creek milkvetch	6,117,000	5,442,400	-11.0
Plant sp.	ASTAPP	*Astragalus* ***applegotei***	Applegate's milk-vetch	1,293,900	856,700	-33.8
Plant sp.	ASTATI	*Astragalus atratus var. Inseptus*	Mourning milkvetch	19,919,000	13,702,300	-31.2
Plant sp.	ASTCLA	*Astragalus collinus* ***var. Laurentii***	Laurence's milk-vetch	9,759,300	3,758,600	-61.5
Plant sp.	ASTCOL	*Astragalus columbianus*	Columbia milk-vetch	15,407,700	10,715,000	-30.5
Plant sp.	ASTDIA	*Astragalus* ***diaphanus var. Diophonus***	Transparent milk-vetch	9,234,600	3,991,700	-56.8
Plant sp.	ASTDID	*Astragalus* ***diaphanus vnr. Diumis***	South john day milk-vetch	5,254,900	2,859,600	-45.6
Plant sp.	ASTHOW	*Astragalus howellii*Howell milk-vetch		14,342,500	9,604,000	-33.0
Plant sp.	ASTJES	***A s r e r j e s s i c a e***	Jessica's aster	4,776,200	1,599,800	-66.5
Plant sp.	ASTMOL	***Aster mollis***		31,814,600	23,758,000	-25.3
Plant sp.	ASTMUL	*Astragalus mulfordiae*	Mulford's milk-vetch	14,521,600	9,722,400	-33.0
Plant sp.	ASTONI	*Astragalus* ***oniciformis***	Picabo milkvetch	18,853,800	12,591,300	-33.2
Plant sp.	ASTPAY	*Astragalus paysonii*	Payson's milkvetch	11,527,800	12,789,200	10.9
Plant sp.	ASTPEC	*Astragalus* ***peckii***	Peck's milk-vetch	23,941,800	18,197,400	-24.0
Plant sp.	ASTPUS	*Astragalus pulsiferae var. Suksdorfii*	Ames' milk-vetch	22,310,000	15,496,600	-30.5
Plant sp.	ASTSCA	*Astragalus scaphoides*	Bitterroot milkvetch	1,293,900	856,700	-33.8
Plant sp.	ASTSIN	*Astragalus sinuatus*	Whited milk-vetch	19,919,000	13,702,300	-31.2
Plant sp.	ASTSOL	Astragalus solitarius	Weak milk-vetch	14,342,500	9,604,000	-33.0
Plant sp.	ASTSTE	*Astragalus sterilis*	Sterile milk-vetch	5,805,200	3,844,000	-33.8
Plant sp.	ASTTEG	*Astragalus tegetarioides*	Bastard kentrophyta	478,700	1,259,800	163.2
Plant sp.	ASTTYG	*Astragalus* ***tyghensis***	Tygh valley milk-vetch	14,993,000	10,959,200	-26.9

Plant sp.	ASTVEN	*Astragalus vexilliflexus var. Nubilus*	White cloud milkvetch	773,200	472,200	-38.9
Plant sp.	ASTYOW	*Astragalus yoder-williomsii*	Osgoodmountains milkvetch	6,055,200	5,358,100	-11.5
Plant sp.	BALROS	***Balsamorhiza rosea***	Rosy balsamroot	4,983,100	2,158,800	-56.7
Plant sp.	BOTASC	***Botrychium ascendens***	Upward-lobed moonwort	211,200	486,600	130.4
Plant sp.	BOTCRE	***Borrychium crenulatum***		10,540,500	12,106,000	14.9
Plant sp.	BOTCRE	***Botrychium crenulatum***	Crenulate moonwort	10,540,500	12,106,000	14.9
Plant sp.	BOTCRE	***Bottychium crenulatum***	Wavy moonwart	10,540,500	12,106,000	14.9
Plant sp.	BOTLIN	***Bortychium lineare***	Linear leaved moonwort	89,600	89,400	-0.2
Plant sp.	BOTLUN	***Bortychium lunaria***	Common moonwort	211,200	486,600	130.4
Plant sp.	BOTPAR	***Borrychium paradoxum***		11,823,800	9,107,800	-23.0
Plant sp.	BOTPAR	***Bortychium paradoxum***	Paradox moonwort	11,823,800	9,107,800	-23.0
Plant sp.	BOTPAR	***Borrychium paradoxum***	Peculiar moonwort	11,823,800	9,107,800	-23.0
Plant sp.	BOTPED	***Bottychium pedunculosum***	Stalked moonwort	4,905,200	2,080,400	-57.6
Plant sp.	BOTPUM	***Botrychium pumicola***	Pumice grape-fern	89,600	89,400	-0.2
Plant sp.	CALLOL	***Calochornrs longebarbarus var.*** *Longebarbatus*	Long-bearded mariposa-lily	16,833,400	8,635,600	-48.7
Plant sp.	CALLOP	Calochortus longebarbatus var. Peckii	Peck's mariposa-lily	17,908,800	12,861,900	-28.2
Plant sp.	CALNIT	*Calochortus**nitidus***	Broad-fruit mariposa	21,481,100	14,434,000	-32.8
Plant sp.	CAMPYG	***Comissonio pygmneo***	Dwarf evening-primrose	657,800	1,378,200	109.5
Plant sp.	CARLED	***Corex lenticularis var. Dolia***	Goose-grass sedge	89,600	89,400	-0.2
Plant sp.	CARPAI	***Cnrex parryana ssp. Idahoa***	Idaho sedge	171,800	95,400	-44.5
Plant sp.	CASCHL	*Castilleja **chlororicn***	Green-tinged paintbrush	31,430,600	22,830,200	-27.4
Plant sp.	CASCRY	*Castilleja **cryptantho***	Obscure indian paintbrush	171,800	95,400	-44.5
Plant sp.	CASPIS	*Castilleja **pilosa vnr. Steenensis***	Steens mt. Paintbrush	10,442,300	5,787,500	-44.6
Plant sp.	CASRUB	*Castilleja rubida*	Purple alpine paintbrush	89,600	89,400	-0.2
Plant sp.	CHACUS	*Chaenactis cusickii*Cusick chaenactis		5,805,200	3,844,000	-33.8
Plant sp.	CHRPAM	***Chrysothamnus parryi ssp. Montanus***	Centennial rabbitbrush	89,600	89,400	-0.2
Plant sp.	CLAUMB	*Claytonia umbellata*	Umbellate spring beauty	3,917,900	1,047,800	-73.3
Plant sp.	COLMAZ	***Collomia mazama***	Mt. Mazama collomia	4,882,300	7,544,900	54.5

Plant sp.	COLREN	*Collomia renacta*	Barren valley collomia	3,917,900	1,047,800	-73.3
Plant sp.	CYMNIV	***Cymoprenrs nivalis***	Hayden's cymopterus	1,154,800	1,200,400	3.9
Plant sp.	CYPFAS	***Cypripedium fasciculatum***		12,035,000	13,940,600	15.8
Plant sp.	CYPFAS	***Cypripedium fasciculatum***	Clustered lady slipper	12,035,000	13,940,600	15.8
Plant sp.	CYPFAS	***Cypripedium fasciculatum***	Clustered lady's slipper	12,035,000	13,940,600	15.8
Plant sp.	CYPFAS	***Cypripedium fasciculatum***	Clustered lady's-slipper	12,035,000	13,940,600	15.8
Plant sp.	DOUIDA	Douglasia idahoensis	Idaho douglasia	3,179,400	3,265,700	2.7
Plant sp.	DRATRI	***Drnbn trichocarpa***	Stanley's whitlow-grass	14,342,500	9,604,000	-33.0
Plant sp.	ERIBAS	***Erigeron basolticus***	Basalt daisy	20,619,500	12,619,500	-38.8
Plant sp.	ERICHR	***Eriogonum chrysops***	Golden buckwheat	1,065,200	1,111,000	4.3
Plant sp.	ERICUS	***Eriogonum cusickii***	Cusick's erigonum	1,065,200	1,111,000	4.3
Plant sp.	ERILAC	***Erigeron lackschewitzii***	Front mountain fleabane	89,600	89,400	-0.2
Plant sp.	ERILAT	***Erigeron latus***	Broad fleabane	15,948,200	12,059,100	-24.4
Plant sp.	ERILEW	***Eriogonum lewisii***	Lewis's buckwheat	1,065,200	1,111,000	4.3
Plant sp.	ERIPRO	***Eriogonum prociduum***	Prostrate buckwheat	1,605,700	2,455,100	52.9
Plant sp.	ERYGRN	*Erythronium grandiflorum* ***var.*** *Nudipetalum*		9,206,400	5,827,700	-36.7
Plant sp.	GRAHET	*Gratiola* ***heterosepala***	Boggs lake hedge-hyssop	1,065,200	1,111,000	4.3
Plant sp.	GRIHOW	***Grindelia howellii***	Howell's gumweed	20,415,900	13,323,000	-34.7
Plant sp.	HACCRO	*Hackelia* ***cronquistii***	Cronquist's stickseed	14,342,500	9,604,000	-33.0
Plant sp.	HACVEN	*Hackelia venusta*	Showy stickseed	4,024,000	7,652,700	90.2
Plant sp.	HAPINS	***Hoplopappus insecticnrris***	Bugleg goldenweed	5,841,400	2,710,800	-53.6
Plant sp.	HAPLIA	*Haplopappus* ***liatriformis***	Palouse goldenweed	4,776,200	1,599,800	-66.5
Plant sp.	HAPRAD	*Haplopappus radiatus*		14,521,600	9,722,400	-33.0
Plant sp.	HOWAQU	***Howellia aquatilis***	Howellia	8,879,500	8,301,800	-6.5
Plant sp.	HOWAQU	***Howellia aquatilis***	Water howellia	8,879,500	8,301,800	-6.5
Plant sp.	IVERHR	Ivesia rhypara var. Rhypara	Grimy ivesia	20,098,100	13,820,700	-31.2
Plant sp.	IVERHS	***Ivesio rhypara var. Shellyi***	Shelly's ivesia	18,800,900	11,995,900	-36.2
Plant sp.	LATGRI	***Larhyrus grimesii***	Grimes vetchling	4,511,300	2,987,300	-33.8

Plant sp.	LEPDAV	*Lepidium davisii*	Davis' peppergrass	19,919,000	13,702,300	-31.2
Plant sp.	LEPPAP	*Lepidium papilliferum*	Slick spot peppergrass	14,342,500	9,604,000	-33.0
Plant sp.	LEPPUH	*Leproductylon pungens ssp. Hazeliae*	Hazel's prickly-phlox	8,694,100	2,647,600	-69.5
Plant sp.	LESCAC	*Lesquerella cnrinota var. Carinata*		4,511,300	2,987,300	-33.8
Plant sp.	LESCAL	*Lesquerello carinata var. Languida*	Keeled bladderpod	11,886,300	6,945,200	-41.6
Plant sp.	LESHUM	*Lesquerella humilis*	Few-seeded bladderpod	1,034,600	657,000	-36.5
Plant sp.	LESPAY	*Lesquerelln paysonii*	Payson's bladderpod	23,567,600	14,145,400	-40.0
Plant sp.	LESSNO	*Lesquerella sp. Nov. ("pulchella")*	Undescribed bladderpod	8,486,800	6,513,000	-23.3
Plant sp.	LOMERY	*Lomatium etyrhrocnrpum*	Red-fruited lomatium	89,600	89,400	-0.2
Plant sp.	LOMGRE	*Lomatium greenmanii*		862,800	561,600	-34.9
Plant sp.	LOMOCH	*Lomatium sp. Nov. ("ochocensis")*		4,983,100	2,158,800	-56.7
Plant sp.	LOMSUK	*Lomatium suksdorfii*	Suksdorf's lomatium	12,926,900	7,614,900	-41.1
Plant sp.	LUISER	*Luina serpentina*		11,885,400	6,940,400	-41.6
Plant sp.	LUPBID	*Lupinus biddlei*	Biddle's lupine	18,260,400	10,651,800	-41.7
Plant sp.	LUPCUS	*Lupinus cusickii*	Prairie lupine	20,397,700	14,962,100	-26.6
Plant sp.	MECORE	*Meconella oregana*	White meconella	548,600	289,300	-47.3
Plant sp.	MENMOL	Mentzelia mollis	Smooth mentzelia	18,853,800	12,591,300	-33.2
Plant sp.	MENPAC	*Mentzelia packardiae*	Packard's mentzelia	14,342,500	9,604,000	-33.0
Plant sp.	MIMCLI	*Mimulus clivicoln*		20,707,200	16,212,500	-21.7
Plant sp.	MIMCLI	*Mimulus clivicoln*	Bank monkey flower	20,707,200	16,212,500	-21.7
Plant sp.	MIMEVA	*Mimulus evanescens*	Disappearing monkeyflower	14,883,000	10,948,100	-26.4
Plant sp.	MIMHYM	*Mimulus hymenophyllus*	Membrane-leaved monkeyflower	16,767,700	15,145,100	-9.7
Plant sp.	MIMJEP	*Mimulus jepsonii*	Jepson's monkeyflower	16,152,000	14,903,300	-7.7
Plant sp.	MIMJUN	*Mimulus jungermannioides*	Hepatic monkeyflower	8,873,200	2,766,000	-68.8
Plant sp.	MIMLAT	*Mimulus latidens*	Broad-toothed monkeyflower	14,342,500	9,604,000	-33.0
Plant sp.	MIMPAT	*Mimulus patulus*	Stalk-leaved monkeyflower	11,885,400	6,940,400	-41.6
Plant sp.	MIMPUL	*Mimulus pulsiferae*	Pulsifer monkeyflower	16,809,800	16,281,500	-3.1
Plant sp.	MIMPYG	*Mimulus pygmaeus*	Pygmy monkeyflower	36,037,400	26,685,300	-26.0

Plant sp.	MIMSUK	*Mimulus suksdorfii*	Suksdorf's monkey-flower	34,233,700	27,792,200	-18.8
Plant sp.	MIMTRI	*Mimulus tricolor*	Three-colored monkeyflower	12,200,500	11,935,200	-2.2
Plant sp.	MIMWAW	*Mimulus washingtonensis var. Wushingtonensis*	Washington monkeyflower	35,478,000	24,389,500	-31.3
Plant sp.	MIRBIR	*Mirnbilis biglovii var. Retrosa*		1,293,900	856,700	-33.8
Plant sp.	MIRMAC	*Mirobilis macfurlonei*	Mac farlane's four o'clock	8,694,100	2,647,600	-69.5
Plant sp.	MIRMAC	*Mirnbilis macfurlonei*	Macfarlane's 4-0-clock	8,694,100	2,647,600	-69.5
Plant sp.	ORYCON	*Oryzopsis contracta*		19,919,000	13,702,300	-31.2
Plant sp.	ORYCON	Oryzopsis contracta	Ricegrass	19,919,000	13,702,300	-31.2
Plant sp.	ORYHEN	*Oryzopsis hendersonii*	Henderson's rice-grass	4,983,100	2,158,800	-56.7
Plant sp.	ORYHEN	*Oryzopsis hendersonii*	Henderson's ricegrass	4,983,100	2,158,800	-56.7
Plant sp.	OXYCAC	*Oxytropis campestris var. Columbiana*	Columbia crazyweed	12,743,700	7,492,400	-41.2
Plant sp.	OXYCAW	*Oxytropis campestris var. Wanapum*	Wanapum crazyweed	14,342,500	9,604,000	-33.0
Plant sp.	PAPPYG	*Papaver pygmoeum*	Alpine poppy	89,600	89,400	-0.2
Plant sp.	PARKOP	*Parnassia kotzebuei var. Pumila*		89,600	89,400	-0.2
Plant sp.	PENBAR	*Penstemon barrettiae*	Barrett's penstemon	20,415,900	13,323,000	-34.7
Plant sp.	PENDAP	*Pensremon davidsonii var. Praeteritus*		23,036,600	12,251,600	-46.8
Plant sp.	PENDEV	*Penstemon deustus var.Variabilis*	Hot-rock penstemon	13,684,100	6,894,700	-49.6
Plant sp.	PENGLA	*Penstemon glaucinus*	Blue-leaved penstemon	17,951,900	16,449,900	-8.4
Plant sp.	PENJAN	*Penstemon janishiae*	Janish's penstemon	23,515,300	13,511,400	-42.5
Plant sp.	PENKIN	*Penstemon kingii*		9,172,800	3,907,400	-57.4
Plant sp.	PENLEM	*Penstemon lemhiensis*	Lemhi penstemon	39,449,700	26,037,500	-34.0
Plant sp.	PENNIK	*Penstemon nikei*		14,821,200	10,863,800	-26.7
Plant sp.	PENPEC	*Penstemon peckii*	Peck's penstemon	8,146,600	6,011,000	-26.2
Plant sp.	PENPER	*Penstemon perpulcher*	Very beautiful penstemon	9,172,800	3,907,400	-57.4
Plant sp.	PENPRA	*Penslemon pratensis*		1,041,800	2,306,000	121.3
Plant sp.	PENSEO	*Penstemon seorsus*	Short lobed penstemon	23,515,300	13,511,400	-42.5
Plant sp.	PENSPA	Penstemon spatulatus		7,955,600	4,865,500	-38.8
Plant sp.	PENWIL	*Penstemon wilcoxii*	Wilcox's penstemon	16,767,700	15,145,100	-9.7

Plant sp.	PERERY	***Perideridia erythrorhiza***	Red-root yampah	4,948,000	1,695,200	-65.7
Plant sp.	PETCM	***Perrophyrum cineroscens***	Chelan rockmat	14,521,600	9,722,400	-33.0
Plant sp.	PHAMIN	***Phacelia minurissimo***	Tiny-flower phacelia	5,074,400	4,033,500	-20.5
Plant sp.	PHYINM	***Physorio integrifolia var. Mon ticola***		19,919,000	13,702,300	-31.2
Plant sp.	PLEORE	*Pleuropogon oregonus*	Oregon semaphore grass	171,800	95,400	-44.5
Plant sp.	POLPEC	*Polemonium pectinatum*	Washington polemonium	28,401,700	17,972,700	-36.7
Plant sp.	RANREC	*Ranunculus* ***reconditus***	Dalles mt. Buttercup	4,780,300	1,603,900	-66.4
Plant sp.	RUBBAR	*Rubus bartonianus*		11,907,000	6,960,000	-41.5
Plant sp.	RUBBAR	*Rubus bartonianus*	Barton berry	11,907,000	6,960,000	-41.5
Plant sp.	SIDORC	*Sidalcea* ***oregana var.*** *Calva*	Oregon checkermallow	563,100	1,046,200	85.8
Plant sp.	SILSEE	*Silene* ***seelyi***	Seely's silene	14,308,100	16,249,400	13.6
Plant sp.	SILSPA	*Silene spaldingii*		27,107,800	28,039,100	3.4
Plant sp.	SILSPA	*Silene* ***spaldingii***	Spalding's catchfly	27,107,800	28,039,100	3.4
Plant sp.	SISSAR	***Sisyrinchium sarmentosum***	Blue-eyed grass	4,024,000	7,652,700	90.2
Plant sp.	STACON	*Stanleya confertiflora*		14,342,500	9,604,000	-33.0
Plant sp.	STEMAL	***Stephanomeria malheurensis***	Malheur wire-lettuce	14,342,500	9,604,000	-33.0
Plant sp.	TAUHOO	*Tauschia hooveri*	Hoover's tuschia	4,987,200	2,162,900	-56.6
Plant sp.	THEEUC	Thelypodium eucosmum		540,500	1,344,100	148.7
Plant sp.	THEEUC	*Thelypodium* ***eucosmum***	Arrow-leaf thelypod	540,500	1,344,100	148.7
Plant sp.	THEHOS	*Thelypodium* ***howellii ssp. Spectabilis***	Howell's spectacular thelypody	1,293,900	856,700	-33.8
Plant sp.	TRIDOU	***Trifolium douglasii***		171,800	95,400	-44.5
Plant sp.	TRIDOU	*Trifolium* ***douglasii***	Douglas's clover	171,800	95,400	-44.5
Plant sp.	TRILEI	*Trifolium* ***leibergii***	Leiberg's clover	1,065,200	1,111,000	4.3
Plant sp.	TRIOWY	*Trifolium owyheense*	Owyhee clover	1,065,200	1,111,000	4.3
Plant sp.	TRITHO	*Trifolium* ***thompsonii***	Thompson's clover	36,002,700	24,156,400	-32.9
Plant group	ALLGR1	*Allium* scablands spp group		3,754,300	4,782,800	27.4
Plant group	ALLGR2	*Allium* riparian spp group		7,309,900	7,978,200	9.1
Plant group	BOTGR1	*Botrychium* forest spp group		39,400	391,200	892.9

Plant group	BOTGR3	*Botrychium* meadow spp group	***89,600***	***89,400***	-0.2
Plant group	CXDMSA	***Curex*** dry meadow subalpine alpine group	***89,600***	***89,400***	-0.2
Plant group	CXEMSA	***Curex*** ephemeral meadow subalpine alpine group	***89,600***	***89,400***	-0.2
Plant group	CXMMSA	***Curex*** mesic meadow subalpine alpine group	***89,600***	89,400	-0.2
Plant group	CXWMSA	*Carex* wet meadow subalpine alpine group	***89,600***	***89,400***	-0.2
Plant group	MIMGUT	***Mimulus guttatus*** complex	51,873,900	50,927,200	-1.8
Plant group	MIMHIE	***Mimulus*** hi elev wet habitat group	15,416,500	17,999,700	16.8
Plant group	MIMLOW	Mimulus low elevation wet habitat	54,474,500	43,729,800	-19.7
Plant group	MIMVER	***Mimulus*** vernal group	42,864,200	30,918,700	-27.9
Plant group	MIMXER	***Mimulus*** xeric group	52,286,300	40,503,400	-22.5
Plant group	PENACU	***Pensremon ncuminn*** tus group	15,157,100	7,869,800	-48.1
Plant group	PENCIN	***Penslemon cinicola*** complex	21,142,000	19,150,400	-9.4
Plant group	PNDOSS	*Penstemon* dry open scab sagebrush group	35,994,100	22,391,300	-37.8
Plant group	PNFMDR	***Pensremon*** foothills to montane dry rocky group	45,926,500	35,821,700	-22.0
Plant group	PNFMMG	*Penstemon* foothills to montane meadow group	30,618,800	25,018,900	-18.3

Table PLNTCONC. Geography and trends of, and threats to, plant species of special concern.

This table lists all fungi species of special concern and rates them for population trend and threats to the population. Also listed are the geographic status of each species according to distribution. GEOGRAPHY (endemism) - 1 = local; 2 = regional; 3 = peripheral; 4 = disjunct; 5 = Scattered: 6 = common; TREND - 1 = increasing; 2 = decreasing; 3 = stable; 4 = unknown; THREATS - E = Exotic/ weed invasion; F = change in fire regime; G = livestock grazing; H = change in hydrologic regime; M = mining; R = recreation; T = timber.
Blanks, except in TREND column, mean that no data were readily available. The nearly 2600 common fungal species are not part of this table. This table has only species of special concern; all are considered rare in the assessment area, and some are endemic. Threats to some species are unknown because of lack of knowledge. All mycorrhizal formers are considered potentialiy threatened by timber management, as they would be impacted to some degree by all silvicultural treatments. The TREND column contains all number 4's for unknown because there is no comprehensive data on population viability of any of the species. These species are considered rare but we know extremely little concerning their biology and ecology. There is an urgent need to direct research on these species.

TAXON	GEOGRAPHY	TREND	THREATS
dbs *toma ci* trina	1	4	
Abstoma plumbed	1	4	
Abstoma reticulatum	1	4	
Abstoma townei	1	4	
Agaricus albolutescens		4	
Albatrellus dispansus		4	
Alpova mollis	4	4	T
Amanita alba		4	T
Amanita armillariformis	1	4	T
Amanita aurantiasquamosa	1	4	T
Amanita malheurensis	1	4	T
Amanita silvicola		4	T
Antrodia alpina		4	
Arcangeliella crassa (=tenax)	4	4	T
Balsamia platyspora	3	4	T
Balsamia vulgaris	3	4	T
Battarraea stevensii	2	4	
Boletus barrowsii	2	4	T
Boletus calopus var. frustosus	2	4	T
Bovista aestivalis		4	
Bovista californica		4	
Bovista dakotensis		4	
Bovista leucoderma		4	
Byssonectria cartilaginea	1	4	
Calocybe onychina		4	
Calvatia *bovista*		4	
Calvatia cretacea		4	
Calvatia excipulifonnis		4	
Calvatia fragilis		4	
Calvatia fumosa var. idahoensis		4	
Calvatia lloydii		4	
Calvatia lycoperdoides		4	
Calvatia owyheensis	1	4	
Calvatia pallida		4	

Calvatia tatrensis		4	
Calvatia utriformis		4	
Cantharellus floccosus var. rainierensis	1	4	T
Cantharellus fumosa	2	4	T
Cantharellus subcretacea		4	T
Cenangium piniphilum	2	4	
Chamonixia brevicolumna	1	4	T
Choiromyces alveolatus	2	4	T
Chroogomphus pseudovinicolor	1	4	T
Ciboria alni		4	
Clavariadelphus sachalinensis		4	
Clavicorona avellanea		4	
Clavicorona divaricata	2	4	
Clitocybe caperata		4	
Clitocybe deceptiva		4	
Clitocybe epigaea		4	
Clitocybe gruberi		4	
Clitocybe pallidipes		4	
Clitocybe payettensis	1	4	
Clitocybe profundidisca		4	
Clitocybe pungens		4	
Clitocybe varispora		4	
Cliyocybe multicarpa		4	
Coprinus martini		4	
Cortinarius albonigrellus		4	T
Cortinarius alnetorum		4	T
Cortinarius delibutus		4	T
Cortinarius fuscoperonatus		4	T
Cortinarius glandicolor		4	T
Cortinarius hemitrichus f. improcerus		4	T
Cortinarius iodes		4	T
Cortinarius jubarinus		4	T
Cortinarius melinus		4	T
Cortinarius mutabilis		4	T
Cortinarius parperculus		4	T
Cortinarius pholideus		4	T
Cortinarius rapaceus		4	T
Cortinarius sanguineus		4	T
Cortinarius saniosus		4	T
Cortinarius sodagnites		4	T
Cortinarius variecolor		4	T
Cortinarius venetus		4	T
Cortinarius vulpicolor		4	T
Crepidotus lagenicystis	4	4	
Crepidotus montanensis	4	4	
Crepidotus payettensis	1	4	
Crepidotus ponderosus			
Crepidotus stratosus	4	4	
Crepidotus sububer	1	4	
Cyathus farcta		4	
Cyathus fimbriatus		4	
Cyathus olla f. lanatus	1	4	
Cystoderma subpurpureum		4	
Dadalea quercina		4	
Daedaleopsis confragosa		4	
Daedaleopsis steroides		4	
Destuntzia subborealis	1	4	

Entoloma lividoalbum		4	T
Fayodia gracilipes		4	
Galerina anelligera	1	4	
Galerina borealis	3	4	
Galerina castanescens	1	4	
Galerina diabolissima	1	4	
Galerina fontinalis	1	4	
Galerina fuscobrunnea	1	4	
Galerina mainsii	1	4	
Galerina nordmaniana	1	4	
Galerina payettensis	1	4	
Galerina pseudostylifera	1	4	
Galerina pubescentipes	1	4	
Galerina stylifera var. badia	1	4	
Galerina stylifera var. velosa	1	4	
Galerina triscopa f. longocystis		4	
Gastroboletus subalpinus	2	4	T
Gastroboletus turbinatus var. flammeus	1	4	T
Gautieria monitcola	3	4	T
Genabea cerebriformis	4	4	T
Geopora clausa	4	4	T
Geopora sepulta	3	4	T
Gloeophyllum odoratum		4	
Gymnomyces ferruginascens	1	4	T
Gymnopilus rufobrunneus		4	
Gymnopilus terrestris		4	
Hebeloma alpinicola	1	4	T
Hebeloma idahoense	3	4	T
Hebeloma kellogense	1	4	T
Hebeloma latisporum	3	4	T
Hebeloma mesophaeum var. subobscurum	1	4	T
Hebeloma occidentale	1	4	T
Hebeloma oregonense	1	4	T
Hebeloma parcivelum	1	4	T
Hebeloma pseudofastible var. distans	1	4	T
Hebeloma pungens	1	4	T
Hebeloma salmonense	1	4	T
Hebeloma stanleyense	1	4	T
Hebeloma strophosum var. occidentale	1	4	T
Hebeloma vinaceogriseum		4	T
Helvella corium	2	4	T
Helvella crassitunicata	2	4	T
Helvella maculata	2	4	T
Henningsomyces candidus		4	
Hydnellum cyanopodium		4	T
Hydnellum mirabile		4	T
Hydnellum pseudocaeruleum		4	T
Hydnellum regium		4	T
Hydnotrya michaelis	4	4	T
Hydnum indurescens		4	T
Hygrophorus albicarneus	1	4	
Hygrophorus albiflavus	1	4	
Hygrophorus burgdorfensis	1	4	
Hygrophorus ellenae	1	4	
Hygrophorus nordmanensis	1	4	
Hygrophorus velatus	1	4	
Hygrophorus vinicolor	1	4	

Hypoxylon serpens var. *macrospora*		4	
Hysterangium *fallax*	2	4	T
Inocybe boltoni		4	T
Inocybe hystrix		4	T
Itajahya galericulata	1	4	
Kuehneromyces carbonicola		4	
Lactarius gossypinus	1	4	T
Lactarius payettensis	3	4	T
*Lactarius rufus var. parvus*1		4	T
Leccinum clavatum		4	T
Leccinum idahoense		4	T
Leccinum incarnatum		4	T
Leccinum subfulvum		4	T
Leccinum truebloodii	1	4	T
Lentinellus truebloodii		4	
Lepiota atrodisca		4	
Leptonia sarcitula		4	
Leptosphaeria hysterioides		4	
Leucopaxillus albissimus var. monticola		4	
Leucopaxillus septentrionalis		4	
Leucophleps magnata	4	4	T
Lyophyllum brunellae		4	
Lyophyllum canescetipes		4	
Lyophyllum chamaeleon		4	
Lyophyllum chondrocephalum		4	
Lyophyllum fistulosum		4	
Lyophyllum gracile		4	
Lyophyllum investitum		4	
Lyophyllum leptosarx		4	
Macowani *tes acris*	1	4	T
Macowanites citrinus	1	4	T
Macowanites fulvescens	1	4	T
Macowanites fuscoviolaceus	1	4	T
Macowanites lilacinus	1	4	T
Macowanites nauseosus	1	4	T
Macowanites olidus	1	4	T
Macowanites pinicola	1	4	T
Macowanites pseudometicus	1	4	T
Macowanites subolivaceous	1	4	T
Macowanites subrosaceus	1	4	T
Macowanites vinicolor	1	4	T
Martellia brunnescens	4	4	T
Martellia ellipsospora	4	4	T
M a r t e l l i a foetens	4	4	T
Martellia fragans	1	4	T
Martellia fulvispora	1	4	T
Martellia monticola	4	4	T
Martellia subalpina	4	4	T
Martellia subochracea	4	4	T
Melanogaster ambiguus	4	4	T
Melanogaster tuberiformis			
Montagnea candollei		4	
Morchella semilibera		4	
Mucronella calva var. aggregata		4	
Nannfeldtiella aggregata	2	4	
Omphalina chrysophylla var. salmonispora		4	
Onygena equina		4	

Ophiobolus prunellae		4	
Peniophora decorticans		4	
Peziza ammophila	1	4	
Phaeocollybia deceptiva		4	T
Phellorinia inquinans		4	
Pholiota agglutinata	1	4	
Pholiota atripes	3	4	
Pholiota aurantioflava	1	4	
Pholiota avellaneifolia	1	4	
Pholiota baptistii	1	4	
Pholiota brunnea	1	4	
Pholiota flavida var. graveolens	1	4	
Pholiota flavopallida	1	4	
Pholiota fulvodisca	1	4	
Pholiota fulvozonata	1	4	F
Pholiota gruberi	1	4	
Pholiota hiemalis	1	4	
Pholiota humii	2	4	
Pholiota lubrica var. luteifolia	2	4	
Pholiota luteola	1	4	
Pholiota macrocystis	1	4	
Pholiota milleri	2	4	
Pholiota nigripes	2	4	
Pholiota obscura	2	4	
Pholiota occidentalis var. luteifolia	1	4	
Pholiota pallida .	1	4	
Pholiota pulchella var. brevipes	1	4	
Pholiota scamboides	1	4	
Pholiota subechinata	2	4	
Pholiota sublubrica	2	4	
Pholiota subsaponacea	1	4	F
Pholiota tetonensis	1	4	
Pholiota umbilicata	1	4	
Picoa carthusiana	4	4	*T*
Plectania milleri	2	4	
Polyzellus multiplex		4	T
Porphyrellus amylosporus		4	T
Protogautieria lutea	1	4	T
Psathyrella abieticola	2	4	
Psathyrella acuticystis	1	4	
Psathyrella annulata	1	4	
Psathyrella aregentata	1	4	
Psathyrella boulderensis	1	4	
Psathyrella communis	4	4	
Psathyrella crassulistipes	1	4	
Psathyrella deserticola	1	4	
Psathyrella ellenae	1	4	
Psathyrella equina	4	4	
Psathyrella fragans	1	4	
Psathyrella fulva	1	4	
Psathyrella fuscospora	1	4	
Psathyrella gruberi	1	4	F
Psathyrella idahoensis	1	4	
Psathyrella lepidotoides	1	4	
Psathyrella mesocystis	1	4	
Psathyrella nezpercii	2	4	
Psathyrella oregonensis	1	4	

Psathyrella owyheensis	1	4	
Psathyrella populorum	1	4	
Psathyrella praetenuis	1	4	
Psathyrella pseudolimicola	2	4	
Psathyrella psilocyboides	4	4	
Psathyrella q-uercicola	1	4	
Psathyrella roothaanensis	1	4	
Psathyrella rufogrisea var. bonnerensis	1	4	
Psathyrella rufogrisea var. riparia	1	4	
Psathyrella salictaria	1	4	
Psathyrella stuntzii	2	4	
Psathyrella subalpina	1	4	
Psathyrella subcaespitosa	1	4	
Psathyrella sublongipes	1	4	
Psathyrella subnuda var. velosa	1	4	
Psathyrella subradicata	1	4	
Psathyrella uskensis	1	4	
Psathyrella variata	1	4	
Psathyrella vesiculocystis	1	4	
Psathyrella wapinitaensis	4	4	
Psathyrella warrenensis	1	4	
Pseudorhizina sphaerospora	1	4	
Psilocybe pelliculosa		4	
Psilocybe semilanceata		4	
Psilocybe subborealis		4	
Pyrenogaster atrogleba	3	4	T
Radiigera fuscogleba	3	4	T
Rhizopogon abietis	4	4	T
Rhizopogon albidus	2	4	T
Rhizopogon albiroseus	2	4	T
Rhizopogon alkalivirens	2	4	T
Rhizopogon alpestris	1	4	T
Rhizopogon anomalus	1	4	T
Rhizopogon arenicola	1	4	T
Rhizopogon argillascens	2	4	T
Rhizopogon avellaneitectus	2	4	T
Rhizopogon bacillisporus	2	4	T
Rhizopogon brunneicol'or	2	4	T
Rhizopogon brunneifibrillosus	2	4	T
Rhizopogon butyraceus	2	4	T
Rhizopogon *chamaleontinus*	4	4	T
Rhizopogon cinerascens	1	4	T
Rhizopogon clavitisporus	4	4	T
Rhizopogon colossus var. colossus	4	4	T
Rhizopogon colossus var. nigromaculatus	2	4	T
Rhizopogon cylindrisporus	1	4	T
Rhizopogon deceptivus	2	4	T
Rhizopogon evadens var. subalpinus	4	4	T
Rhizopogon fallax	2	4	T
Rhizopogon flavofibrillosus4		4	T
Rhizopogon florencianus	1	4	T
Rhizopogon fragans	2	4	T
Rhizopogon fragmentatus	1	4	T
Rhizopogon griseogleba	1	4	T
Rhizopogon hysterangioides	1	4	T
Rhizopogon inquinatus	1	4	T
Rhizopogon kauffmanii	2	4	T

Rhizopogon laetiflavus	1	4	T
Rhizopogon luteoalboides	2	4	T
Rhizopogon luteorubescens	2	4	T
Rhizopogon lutescens	2	4	T
Rhizopogon masonae	1	4	T
Rhizopogon milleri	1	4	T
Rhizopogon molligleba	1	4	T
Rhizopogon obscurus	2	4	T
Rhizopogon ochraceisporus	2	4	T
Rhizopogon ochraceobrunnescens	2	4	T
Rhizopogon ochroleucus	2	4	T
Rhizopogon odoratus	1	4	T
Rhizopogon olivaceoluteus	1	4	T
Rhizopogon oswaldii	2	4	T
Rhizopogon parksii	3	4	T
Rhizopogon parvulus	2	4	T
Rhizopogon proximus	1	4	T
Rhizopogon pseudoaffinis	1	4	T
Rhizopogon pseudoalbus	1	4	T
Rhizopogon quericola	2	4	T
Rhizopogon rogersii	4	4	T
Rhizopogon rubescens var. pallidimaculatus	4	4	T
Rhizopogon rudus	1	4	T
Rhizopogon semireticulatus	2	4	T
Rhizopogon semitectus	2	4	T
Rhizopogon sordidus	4	4	T
Rhizopogon subbadius	2	4	T
Rhizopogon subcaerulescens var. viridescens	1	4	T
Rhizopogon subcinnamomeus	4	4	T
Rhizopogon subclavitisporus	4	4	T
Rhizopogon subcroceus	2	4	T
Rhizopogon subgelatinosus	4	4	T
Rhizopogon sublateritius	4	4	T
Rhizopogon subolivascens	1	4	T
Rhizopogon subpurpurascens	2	4	T
Rhizopogon subradicatus	4	4	T
Rhizopogon subsalmonius var. griseolilascens	1	4	T
Rhizopogon subsalmonius var. roseitinctus	1	4	T
Rhizopogon subsalmonius var. similis	2	4	T
Rhizopogon udus	2	4	T
Rhizopogon umbrinoviolascens	2	4	T
Rhizopogon variabilisporus	4	4	T
Rhizopogon vesiculosus	2	4	T
Rhizopogon villescens	4	4	T
Rhizopogon zelleri	4	4	T
Rhodoscypha ovilla	1	4	
Russula crenulata	2	4	T
Russula idahoensis	2	4	T
Russula nana	2	4	T
Russula olivacea	2	4	T
Russula subdepallens	2	4	T
Russula velenovskyi	2	4	T
Russula vinosa		4	T
Sarcodon fuscoindicus		4	T
Sclerogaster xerophila	4	4	T

Simocybe rubi		4	
Sowerbyella imperialis		4	T
Sowerbyella rhenana	1	4	
Spathularia flavida var. ramosa		4	
Stropharia aeruginosa		4	
Suillus imitatus	2	4	T
Suillus pallidiceps	2	4	T
Suillus pseudobrevipes	2	4	T
Tapesia strobicula		4	
Tomentella lateritia		4	T
Tricholomopsis cystidiosum		4	
Truncocolumella citrina var. separabilis	1	4	T
Tuber irradians	2	4	T
Tuber rufum var. nitidum	5	4	T
Tylopilus pseudoscaber		4	T
Typhula idahoensis		4	
Weraroa coprophila		4	
Weraroa nivalis		4	
wolfiporia cocos		4	
Wynnella silvicola			

Appendix PLNTHERB. Vascular and nonvascular plant species and species groups using open or closed, grassland/herb structural stages in the assessment area of the Interior Columbia Basin Ecosystem Management Project. Species were determined from a select list of 219 threatened or endangered, C1 and C2 candidate threatened and endangered species, and special-interest groups.

Class*	Scientific name	Common name	Versatility**
P	*Aster jessicae*	Jessica's aster	0
P	*Carex parryana* ssp. *idahoa*	Idaho sedge	0
P	*Castilleja cryptantha*	Obscure indian paintbrush	0
P	*Claytonia umbellata*	Umbellate spring beauty	0
P	*Collomia renacta*	Barren valley collomia	0
P	*Haplopappus liatriformis*	Palouse goldenweed	0
P	*Leptodactylon pungens* ssp. *hazeliae*	Hazel's prickly-phlox	0
P	*Mirabilis macfarlanei*	Mac farlane's four o'clock	0
P	*Perideridia erythrorhiza*	Red-root yampah	0
P	*Pleuropogon oregonus*	Oregon semaphore grass	0
P	*Trifolium douglasii*	Douglas's clover	0
P	*Allium aaseae*	Aase's onion	1
P	*Astragalus atratus* var. *inseptus*	Mourning milkvetch	1
P	*Astragalus columbianus*	Columbia milk-vetch	1
P	*Astragalus diaphanus* var. *diaphanus*	Transparent milk-vetch	1
P	*Astragalus diaphanus var. diurnis*	South john day milk-vetch	1
P	*Astragalus howellii*	Howell milk-vetch	1
P	*Astragalus mulfordiae*	Mulford's milk-vetch	1
P	*Astragalus oniciformis*	Picabo milkvetch	1
P	*Astragalus sinuatus*	Whited milk-vetch	1
P	*Astragalus solitarius*	Weak milk-vetch	1
P	*Draba trichocarpa*	Stanley's whitlow-grass	1
P	*Hackelia cronquistii*	Cronquist's stickseed	1
P	*Ivesia rhypara* var. *rhypara*	Grimy ivesia	1
P	*Lepidium davisii*	Davis' peppergrass	1
P	*Lepidium papilliferum*	Slick spot peppergrass	1
P	*Mentzelia mollis*	Smooth mentzelia	1
P	*Mentzelia packardiae*	Packard's mentzelia	1
P	*Mimulus jungermannioides*	Hepatic monkeyflower	1
P	*Mimulus latidens*	Broad-toothed monkeyflower	1
P	*Oryzopsis contracta*	Ricegrass	1
P	*Oxytropis campestris* var. *wanapum*	Wanapum crazyweed	1
P	*Penstemon perpulcher*	Very beautiful penstemon	1
P	*Petrophytum cinerascens*	Chelan rockmat	1
P	*Ranunculus reconditus*	Dalles mt. Buttercup	1
P	*Stephanomeria malheurensis*	Malheur wire-lettuce	1
L	*Texosporium sancti-jacobi*	Wovenspored lichens	1
P	*Astragalus collinus* var. *laurentii*	Laurence's milk-vetch	2
P	*Balsamorhiza rosea*	Rosy balsamroot	2
P	*Castilleja pilosa* var. *steenensis*	Steens mt. Paintbrush	2

P	Erigeron ***basalticus***	Basalt daisy	2
P	***Erigeron latus***	Broad fleabane	2
P	***Haplopappus insecticruris***	Bugleg goldenweed	2
P	***Lupinus biddlei***	Biddle's lupine	2
P	***Lupinus cusickii***	Prairie lupine	2
P	***Mimulus evanescens***	Disappearing monkeyflower	2
P	***Oryzopsis hendersonii***	Henderson's ricegrass	2
P	***Astragalus tyghensis***	Tygh valley milk-vetch	3
P	***Ivesia rhypara*** var. ***shellyi***	Shelly's ivesia	3
P	***Penstemon deustus*** var. ***variabilis***	Hot-rock penstemon	3
P	***Penstemon janishiae***	Janish's penstemon	3
P	***Penstemon seorsus***	Short lobed penstemon	3
P	***Tauschia hooveri***	Hoover's tuschia	3
LG	Vagrant ground lichens	Vagrant ground lichens	3
LG	Calcareous steppe indicator lichens	Calcareous steppe indicators	5
LG	Fencepost lichens	Fencepost. lichens	5
LG	Soil lichens	Soil lichens	5
LG	Steppe soil crust lichens	Steppe soil crusts	5
P	***Allium*** robinsonii	Robinson's onion	6
P	***Botrychium ascendens***	Upward-lobed moonwort	6
P	***Botrychium lunaria***	Common moonwort	6
P	***Allium dictuon***	Blue mountain onion	7
P	***Artemisia ludoviciana*** ssp. ***etesii***	Estes' artemisia	7
P	***Calochortus longebarbatus*** var. ***longebarbatus***	Long-bearded mariposa-lily	7
P	***Calochortus longebarbatus*** var. *peckii*	Peck's mariposa-lily	7
P	***Grindelia howellii***	Howell's gumweed	7
P	***Lesquerella carinata*** var. *languida*	Keeled bladderpod	7
P	***Mimulus hymenophyllus***	Membrane-leaved monkeyflower	7
P	***Mimulus patulus***	Stalk-leaved monkeyflower	7
P	***Oxytropis campestris*** var. ***columbiana***	Columbia crazyweed	7
P	***Penstemon*** *barrettiae*	Barrett's penstemon	7
P	***Penstemon wilcoxii***	Wilcox's penstemon	7
P	***Astragalus peckii***	Peck's milk-vetch	8
P	***Astragalus pulsiferae*** var. ***suksdorfii***	Ames ' milk-vetch	8
P	***Botrychium paradoxum***	Peculiar moonwort	8
P	***Botrychium pedunculosum***	Stalked moonwort	8
P	*Castilleja* ***chlorotica***	Green-tinged paintbrush	8
P	***Lesquerella humilis***	Few-seeded bladderpod	8
P	***Lesquerella*** sp. ***Nov.*** (*"pulchella"*)	Undescribed bladderpod	8
P	***Arabis fecunda***	Sapphire rockcress	9
P	***Calochortus nitidus***	Broad-fruit mariposa	9
P	***Lesquerella paysonii***	Payson's bladderpod	9

P	*Lomatium suksdorfii*	Suksdorf's lomatium	9
P	*Mimulus suksdorfii*	Suksdorf's monkey-flower	9
P	*Penstemon lemhiensis*	Lemhi penstemon	9
P	*Trifolium thompsonii*	Thompson's clover	9
P	*Mimulus clivicola*	Bank monkey flower	10
P	*Mimul us pygmaeus*	Pygmy monkeyflower	10
P	*Mimulus washingtonensis* var. *washingtonensis*	Washington monkeyflower	10
P	*Polemonium pectinatum*	Washington polemonium	10
P	*Rubus bartonianus*	Barton berry	10
P	*Silene spaldingii*	Spalding's catchfly	10
P	*Allium bisceptrum*		12
P	*dllium nevii*		12
P	*Allium punctum*		12
P	*Arabis falcifructa*		12
P	*Aster mollis*		12
LG	Calcareous indicator lichens	Calcareous rock indicators	12
P	*Erythronium grandiflorum* var. *nudipetalum*		12
LG	Excess nitrogen indicator lichens	Excess nitrogen indicators	12
P	*Haplopappus radiatus*		12
P	*Lomatium* sp. *Nov.* ("*ochocensis*")		12
P	*Luina serpentina*		1 2
LG	Metal rich indicator lichens	Metal rich indicators	12
P	*Mimulus ampliatus*		12
PG	*Mimulus guttatus* complex		12
PG	*Mimulus* low elevation wet habitat		12
PG	*Mimulus* vernal group		12
PG	Mimulus *xeric* group		12
LG	*Moss* and ditritus binders lichens	Moss and ditritus binders	12
LG	N-fixing rock lichens	N-fixing rock lichens	12
LG	N-fixing soil lichens	N-fixing soil lichens	12
PG	*Penstemon acuminatus* group		12
P	*Penstemon davidsonii var. praeteritus*		12
P	*Penstemon kingii*		12
P	*Penstemon nikei*		12
P	*Penstemon spatulatus*		12
P	*Physaria integrifolia var. monticola*		12
LG	Pioneer soil stabilizers lichens	Pioneer soil stabilizers	12
PG	*Penstemon* dry open scab sagebrush group		12
PG	*Penstemon* foothills to montane dry rocky group		12

PG	***Penstemon*** foothills to montane meadow group		12	
BG	Rock calcareous bryophyte		12	
LG	Rock crusts lichens	Rock crusts	12	
LG	Rock macro lichens	Rock macrolichens	12	
BG	Rock other bryophyte		12	
BG	Rock wet bryophyte		1	2
LG	Seepage lichens	Seepage rock lichens	12	
LG	Sheltered ledges and overhangs lichens	Sheltered ledges and overhangs	12	
BG	Soil dry bryophyte		12	
BG	Soil wet bryophyte		12	
P	***Stanleya confertiflora***		12	
LG	Urban pollution-tolerant	Urban pollution tolerant lichens	12	

[a] B=bryophyte; BG=bryophyte group; L=lichen; LG=lichen group; P=plant species; PG = plant group.

[b] - Versatility rating denotes the number of other-structural stages used by the species (11 maximum).

Appendix PLNTSHRB. Vascular and nonvascular plant species and species groups using open or closed, low-medium shrub structural stages in the assessment area of the Interior Columbia Basin Ecosystem Management Project. Species were determined from a select list of 219 threatened or endangered, C1 and C2 candidate threatened and endangered species, and special-interest groups.

Class	Scientific name	Common name	Versatility
P	*Artemisia campestris* var. *wormskioldii*	Northern wormwood	0
P	*Allium constricturn*	Douglas constricted onion	0
P	*Astragalus applegatei*	Applegate's milk-vetch	0
P	*Astragalus scaphoides*	Bitterroot milkvetch	0
P	*Astragalus sterilis*	Sterile milk-vetch	0
P	*Botrychium lineare*	Linear leaved moonwort	0
P	*Botrychium pumicola*	Pumice grape-fern	0
P	*Camissonia pygmaea*	Dwarf evening-primrose	0
P	*Carex lenticularis* var. *dolia*	Goose-grass sedge	0
P	*Castilleja rubida*	Purple alpine paintbrush	0
P	*Chaenactis cusickii*	Cusick chaenactis	0
P	*Chrysothamnus parryi* ssp. *montanus*	Centennial rabbitbrush	0
P	*Cymopterus nivalis*	Hayden's cymopterus	0
P	*Eriogonum chrysops*	Golden buckwheat	0
P	*Eriogonumcusickii*	Cusick's erigonum	0
P	*Erigeron lackschewitzii*	Front mountain fleabane	0
P	Eriogonum lewisii	Lewis's 'buckwheat	0
P	*Gratiola heterosepala*	Boggs lake hedge-hyssop	0
P	*Lathyrus grimesii*	Grimes vetchling	0
P	*Lomatium erythrocarpum*	Red-fruited lomatium	0
P	*Papaver pygmaeum*	Alpine POPPY	0
P	*Thelypodium howellii* ssp. *spectabilis*	Howell's spectacular thelypody	0
P	*Trifolium leibergii*	Leiberg's clover	0
P	*Trifolium owyheense*	Owyhee clover	0
P	*Allium aaseae*	Aase's onion	1
P	*Astragalus anserinus*	Goose creek milkvetch	1
P	*Astragalus atratus* var. *inseptus*	Mourning milkvetch	1
P	*'Astragalus columbianus*	Columbia milk-vetch	1
P	*Astragalus howellii*	Howell milk-vetch	1
P	*Astragalus mulfordiae*	Mulford's milk-vetch	1
P	*Astragalus onicifonnis*	Picabo milkvetch	1
P	*Astragalus sinuatus*	Whited milk-vetch	1
P	*Astragalus solitarius*	Weak milk-vetch	1
P	*Astragalus yoder-williamsii*	Osgoodmountains milkvetch	1
P	*Draba trichocarpa*	Stanley's whitlow-grass	1
P	*Eriogonum prociduum*	Prostrate buckwheat	1
P	*Hackelia cronquistii*	Cronquist's stickseed	1
P	Ivesia rhypara var. *rhypara*	Grimy ivesia	1

P	***Lepidium davisii***	Davis' peppergrass	1
P	***Lepidium papilliferum***	Slick spot peppergrass	1
P	***Mentzelia mollis***	Smooth mentzelia	1
P	***Mentzelia*** *packardiae*	Packard's mentzelia	1
P	***Mimulus jungennannioides***	Hepatic monkeyflower	1
P	***Mimulus latidens***	Broad-toothed monkeyflower	1
P	***Oryzopsis contracta***	Ricegrass	1
P	***Oxytropis campestris*** var. ***wanapum***	Wanapum'crazyweed	1
P	***Petrophytum cinerascens***	Chelan rockmat	1
P	***Stephanomeria malheurensis***	Malheur wire-lettuce	1
L	***Texosporium sancti-jacobi***	Wovenspored lichens	1
P	***Astragalus collinus*** var. ***laurentii***	Laurence's milk-vetch	2
P	***Balsamorhiza rosea***	Rosy balsamroot	2
P	***Castilleja pilosa*** var. ***steenensis***	Steens ***mt.*** Paintbrush	2
P	***Erigeron basalticus***	Basalt daisy	2
P	***Erigeron latus***	Broad fleabane	2
P	***Haplopappus insecticruris***	Bugleg goldenweed	2
P	***Lupinus biddlei***	Biddle's lupine	2
P	Lupinus cusickii	Prairie lupine	2
P	***Mimulus evanescens***	Disappearing monkeyflower	2
P	***Oryzopsis hendersonii***	Henderson's ricegrass	2
P	***Astragalus tyghensis***	Tygh valley milk-vetch	3
P	***Xvesia rhypara*** var. ***Shellyi***	Shelly's ivesia	3
P	***Penstemon deustus*** var. ***Variabilis***	Hot-rock penstemon	3
P	***Penstemon janishiae***	Janish's penstemon	3
P	***Penstemon seorsus***	Short lobed penstemon	3
P	***Tauschia hooveri***	Hoover's tuschia	3
LG	Vagrant ground lichens	Vagrant ground lichens	3
P	***Phacelia minutissima***	Tiny-flower phacelia	4
LG	Calcareous steppe indicator lichens	Calcareous steppe indicators	5
LG	Fencepost lichens	Fencepost lichens	5
LG	Soil lichens	Soil lichens	5
LG	Steppe soil crust lichens	Steppe soil crusts	5
P	***Allium tolmiei*** var. *persimile*	Tolmie's onion	6
P	***Astragalus paysonii***	Payson's milkvetch	6
P	***Collomia mazama***	Mt. Mazama collomia	6
P	***Douglasia idahoensis***	Idaho douglasia	6
P	***Penstemon peckii***	Peck's penstemon	6
P	Artemisia ludoviciana ssp. ***estesii***	Estes' artemisia	7
LG	***Charred snag lichens***	Charred snag lichens	7
P	***Mimulus pulsiferae***	Pulsifer monkeyflower	7
P	***Penstemon glaucinus***	Blue-leaved penstemon	7

P	*Astragalus peckii*	Peck's milk-vetch	8
P	*Astragalus pulsiferae* var. *suksdorfii*	Ames' milk-vetch	8
P	*Botrychium paradoxum*	Peculiar moonwort	8
P	*Botrychium pedunculosum*	Stalked moonwort	8
P	*Castilleja chlorotica*	Green-tinged paintbrush	8
P	*Lesquerella humilis*	Few-seeded bladderpod	8
P	*Lesquerella sp. Nov. ("pulchella")*	Undescribed bladderpod	8
P	*Arabis fecunda*	Sapphire rockcress	9
P	*Calochortus nitidus*	Broad-fruit mariposa	9
P	*Lesquerella paysonii*	Payson's bladderpod	9
P	*Lomatium suksdorfii*	Suksdorf's lomatium	9
P	*Mimulus suksdorfii*	Suksdorf's monkey-flower	9
P	*Penstemon lemhiensis*	Lemhi penstemon	9
P	*Trifolium thompsonii*	Thompson's clover	9
P	*Mimulus clivicola*	Bank monkey flower	10
P	*Mimulus pygmaeus*	Pygmy monkeyflower	10
P	*Mimulus washingtonensis* var. *washingtonensis*	Washington monkeyflower	10
P	*Polemonium pectinatum*	Washington polemonium	10
P	*Rubus bartonianus*	Barton berry	10
P	*Silene spaldingii*	Spalding's catchfly	10
P	*Allium bisceptrum*		12
P	*Allium punctum*		12
P	*Antennaria aromatica*		12
P	*Arabis falcifructa*		12
P	*Aster mollis*		12
PG	*Botrychium* meadow spp group		12
LG	*Calcareous* indicator lichens	Calcareous rock indicators	12
PG	*Carex* dry meadow subalpine alpine group		12
PG	*Carex* ephemeral meadow subalpine alpine group		12
PG	*Carex* mesic meadow subalpine alpine group		12
PG	*Carex* wet meadow subalpine alpine group		12
LG	Excess nitrogen indicator lichens	Excess nitrogen indicators	12
P	*Haplopappus radiatus*		12
P	Lesquerella carinata var. *carinata*		12
P	*Lomatium greenmanii*		12
P	*Lomatium* sp. *Nov.* *("ochocensis")*		12
LG	Metal rich indicator lichens	Metal rich indicators	12
PG	*Mimulus guttatus* complex		12

PG	***Mimulus*** hi elev wet habitat group		12
PG	***Mimulus*** low elevation wet habitat		12
PG	Mimulus vernal group		12
PG	***Mimulus xeric group***		12
P	***Mirabilis biglovii*** var. ***retrosa***		12
LG	Moss and ditritus binders lichens	**Moss** and ditritus binders	'12
LG	N-fixing rock lichens	N-fixing rock lichens	12
LG	N-fixing soil lichens	N-fixing soil lichens	12
P	***Parnassia kotzebuei*** var. ***pumila***		12
PG	***Penstemon acuminatus*** group		12
PG	***Penstemon cinicola*** complex		12
P	***Penstemon davidsonii*** var. ***Praeteritus***		12
P	Penstemon ***nikei***		12
P	***Penstemon spatulatus***		12
P	***Physaria integrifolia*** var. ***monticola***		12
LG	Pioneer soil stabilizers lichens	Pioneer soil stabilizers	12
PG	***Penstemon*** **dry** open scab sagebrush group		12
PG	***Penstemon*** foothills to montane dry rocky group		12
PG	***Penstemon*** foothills to montane meadow group		12
BG	Rock calcareous bryophyte		12
LG	Rock crusts lichens	Rock crusts	12
LG	Rock macro lichens	Rock macrolichens	12
BG	Rock other bryophyte		12
BG	Rock wet bryophyte		12
LG	Seepage lichens	Seepage rock lichens	12
LG	Sheltered ledges and overhangs lichens	Sheltered ledges and overhangs	12
BG	Soil alkaline bryophyte		12
BG	Soil dry bryophyte		12
BG	Soil wet bryophyte		12
P	***Stanleya confertiflora***		12
LG	Urban pollution-tolerant	Urban pollution tolerant lichens	12

[a] – B=bryophyte; BG=bryophyte group; L=lichen; LG=lichen group; P=plant species; PG = plant group.
[b] – Versatility rating denotes the number of other structural stages used by the species (11 maximum).

Appendix PLNTOLDF. Vascular and nonvascular plant species and species groups using single- and multi-storied old forest structural stages in the assessment area of the Interior Columbia Basin Ecosystem Management Project. Species were determined from a select list of 219 threatened or endangered, C1 and C2 candidate threatened or endangered species, and special-interest groups.

Class'	Scientific name	Common name	Versa-tility*
P	***Astragalus vexilliflexus*** var. ***nubilus***	White cloud milkvetch	4
P	***Botrychium crenulatum***	Wavy moonwart	4
P	***Hackelia venusta***	Showy stickseed	4
P	***Howellia aquatilis***	Water howellia	4
P	***Sisyrinchium sarmentosum***	Blue-eyed grass	4
P	Allium ***madidum***	Swamp onion	5
P	***Mimulus jepsonii***	Jepson's monkeyflower	5
LG	Oceanic forage lichens	Oceanic forage lichens	5
L	Oceanic fruticose	Oceanic fruticose	5
LG	Oceanic leaf lichens	Oceanic leaf lichens	5
LG	Oceanic tree crust lichens	Oceanic tree crusts	5
P	***Silene seelyi***	Seely's silene	5
P	***Allium robinsonii***	Robinson's onion	6
P	***Allium tolmiei*** var. ***persimile***	Tolmie's onion	6
P	***Astragalus paysonii***	Payson's milkvetch	6
P	***Botrychium ascendens***	Upward-lobed moonwort	6
P	***Botrychium lunaria***	Common moonwort	6
P	***Collomia mazama***	*Mt.* Mazama collomia	6
P	***Cypripedium fasciculatum***	Clustered lady slipper	6
P	***Douglasia idahoensis***	Idaho douglasia	6
LG	Forage lichens	Forage	6
LG	Fruticose tree lichens	Fruticose tree lichens	6
LG	Leaf lichens	Leaf lichens	6
P	***Mimulus tricolor***	Three-colored monkeyflower	6
LG	N-fixing epiphytes lichens	N-fixing epiphytes	6
LG	N-fixing riparian lichens	N-fixing riparian	6
LG	Oceanic log lichens	Oceanic log lichens	6
P	***Penstemon*** *peckii*	Peck's penstemon	6
LG	Pin lichens	Pin lichens	6
LG	Riparian lichens	Riparian	6
LG	Rotten log and tree base lichens	Rotten log and tree base	6
LG	Tree crusts	Tree crust lichens	6
P	***Allium dictuon***	Blue mountain onion	7
P	***Artemisia ludoviciana*** ssp. *estesii*	Estes' artemisia	7
P	***Calochortus longebarbatus*** var. ***longebarbatus***	Long-bearded mariposa-lily	7
P	***Calochortus longebarbatus*** var. ***peckii***	Peck's mariposa-lily	7
LG	Charred snag lichens	Charred snag lichens	7
P	***Grindelia howellii***	Howell's gumweed	7

P	*Lesquerella carinata* var. *languida*	Keeled bladderpod	7
P	*Mimulus hymenophyllus*	Membrane-leaved monkeyflower	7
P	*Mimulus patulus*	Stalk-leaved monkeyflower	7
P	*Mimulus pulsiferae*	Pulsifer monkeyflower	7
P	*Oxytropis campestris var. columbiana*	Columbia crazyweed	7
P	*Penstemon barrettiae*	Barrett's penstemon	7
P	*Penstemon glaucinus*	Blue-leaved penstemon	7
P	*Penstemon wilcoxii*	Wilcox's penstemon	7
P	Astragalus peckii	Peck's milk-vetch	8
P	*Astragalus pulsiferae* var. *suksdorfii*	Ames' milk-vetch	8
P	*Botrychium paradoxum*	Peculiar moonwort	8
P	*Botrychium pedunculosum*	Stalked moonwort	8
P	*Castilleja chlorotica*	Green-tinged paintbrush	8
P	*Lesquerella humilis*	Few-seeded bladderpod	8
P	*Lesquerella* sp. Nov. ("*pulchella*")	Undescribed bladderpod	8
P	*Arabis fecunda*	Sapphire rockcress	9
P	*Calochortus nitidus*	Broad-fruit mariposa	9
P	*Lesquerella paysonii*	Payson's bladderpod	9
P	*Lomatium suksdorfii*	Suksdorf's lomatium	9
P	*Mimulus suksdorfii*	Suksdorf's monkey-flower	9
P	*Penstemon lemhiensis*	Lemhi penstemon	9
P	*Trifolium thompsonii*	Thompson's clover	9
P	Mimulus clivicola	Bank monkey flower	10
P	*Mimulus pygmaeus*	Pygmy monkeyflower	10
P	*Mimulus washingtonensis* var. *washingtonensis*	Washington monkeyflower	10
P	*Polemonium pectinatum*	Washington polemonium	10
P	*Rubus bartonianus*	Barton berry	10
P	*Silene spaldingii*	Spalding's catchfly	10
P	*Allium bisceptrum*		12
PG	*Allium* scablands spp group		12
PG	*Allium* riparian spp group		12
P	*Allium nevii*		12
P	*Aster mollis*		12
PG	*Botrychium* forest spp group		12
LG	Calcareous indicator lichens	Calcareous rock indicators	12
BG	Decayed wood bryophyte		12
BG	Epiphytic bryophyte		12
P	*Erythronium grandiflorum* var. *nudipetalum*	12	
LG	Excess nitrogen indicator lichens	Excess nitrogen indicators	12
BG	Humus duff bryophyte		12
P	*Lomatium greenmanii*		12

P	*Luina serpentina*		12
LG	Metal rich indicator lichens	Metal rich indicators	12
P	*Mimulus ampliatus*		12
PG	*Mimulus guttatus* complex		12
PG	*Mimulus* hi elev wet habitat group		12
PG	*Mimulus* low elevation wet habitat		12
PG	*Mimulus* vernal group		12
PG	*Mimulus* xeric group		12
LG	Moss and ditritus binders lichens	Moss and ditritus binders	12
LG	N-fixing rock lichens	N-fixing rock lichens	12
LG	N-fixing soil lichens	N-fixing soil lichens	12
PG	*Penstemon cinicola* complex		12
P	*Penstemon spatulatus*		12
LG	Pioneer soil stabilizers lichens	Pioneer soil stabilizers	12
PG	*Penstemon* dry open scab sagebrush group	12	
PG	*Penstemon* foothills to montane dry rocky group	12	
PG	*Penstemon* foothills to montane meadow group	12	
BG	Rock calcareous bryophyte		12
LG	Rock crusts lichens	Rock crusts	12
LG	Rock macro lichens	Rock macrolichens	12
BG	Rock other bryophyte		12
LG	Seepage lichens	Seepage rock lichens	12
LG	Sheltered ledges and overhangs lichens	Sheltered ledges and overhangs	12
BG	Soil dry bryophyte		12
BG	Soil wet bryophyte		12
LG	Urban pollution-tolerant	Urban pollution tolerant lichens	12

[a] - B=bryophyte; BG=bryophyte group; L=lichen; LG=lichen group; P=plant species; PG = plant group.

[b] - Versatility rating denotes the number of other structural stages used by the species (11 maximum).

Table BRYO3. Herbaria housing bryophyte specimens from Columbia River basin, listed by acronym per *Index Herbariorum*. Asterisk (*) indicates herbaria systematically searched for records from study area.

ALTA	University of Alberta, Edmonton
BING	State University of New York, Binghamton
BM	British Museum (Natural History), London
*BSU	Boise State University, Boise
*BUF	Buffalo Museum of Science, Buffalo
C	Botanical Museum, Cophenhagen
CANM	Canadian Museum of Nature, Ottawa
CAS	California Academy of Sciences, San Francisco
COLO	University of Colorado, Boulder
CS	Colorado State University, Fort Collins
CU	Cornell University, Ithaca
DPU	DePauw University, Greencastle
DUKE	Duke University, Durham
FH	Farlow Herbarium, Harvard University, Cambridge
G	Conservatory and Botanical Garden, Geneva
GFC	College of Great Falls, Great Falls
HSC	Humboldt State University, Arcata
IA	University of Iowa, Iowa City
*ID	University of Idaho, Moscow
K	Botanic Gardens, Kew [now housed at BM]
MICH	University of Michigan, Ann Arbor
MIL	Milwaukee Public Museum, Milwaukee
MO	Missouri Botanical Garden, St. Louis
*MONTU	University of Montana, Missoula
NICH	Hattori Botanical Laboratory, Nichinan
NY	New York Botanical Garden, New York
*ORE	of Oregon [now housed at OSC]
*OSC	Oregon State University, Corvallis
P	National Museum of Natural History, Paris
*PSU	Portland State University, Portland
*RM	University of Wyoming, Laramie
S	Museum of Natural History, Stockholm
SMS	Southwest Missouri State University, Springfield
SMU	Southern Methodist University, Dallas
TENN	University of Tennessee, Knoxville
TRTC	University of Toronto, Toronto
UAC	University of Calgary, Calgary
*UBC	University of British Columbia, Vancouver
UCNW	University College of North Wales, Bangor
UWSP	University of Wisconsin, Stevens Point
*WS	Washington State University, Pullman
*WTU	University of Washington, Seattle
US	Smithsonian Institution, Washington D.C.
UT	University of Utah [now housed at COLO]

Without acronym: Grand Teton National Park herbarium, Yellowstone National Park herbarium

Personal herbaria: Guy Brassard, Allan Chambers, John Christy, John Davis, Judith Harpel, Patricia Eckel, Barbara Hoisington

Table PLANTX. Number of accessions of rare plant taxa from the Interior Columbia River Basin for which seeds or living collections are maintained at botanic gardens.

	Botanic Garden		
Taxon	Berry*	Denver	Red Butte
Allium aaseae	1		
Amsinckia carinata		5	
Antennaria arcuata		1	
Arabis fecunda			1#
Artemisia campestris var. wormskioldii		4	
Astragalus applegatei	4		
Astragalus diaphanus var. diurnis		1	
Astragalus mulfordiae	10		
Astragalus peckii	2		
Astragalus sinuatus	6		
Astragalus solitarius	3		
Astragalus sterilis		3	
Astragalus tegetarioides		3	
Astragalus tyghensis	3		
Calochortus longebarbatus var. longebarbatus		3	
Castilleja chlorotica		3	
Castilleja christii			1#
Chaenactis cusickii		1	
Colloma mazama	2		
Cypripedium fasciculatum		1	
Delphinium viridescens	4		
Erigeron basalticus		1	
Eriogonum argophyllum			1
Eriogonum crosbyae	3		
Eriogonum cusickii		4	
Eriogonum prociduum	5		
Hackelia cronquistii	12		
Hackelia venusta	22		
Haplopappus radiatus	10		
Howellia aquatilis	living plants		
Ivesia rhypara var. rhypara		21	
Lepidium davisii	5		
Limnanthes floccosa ssp. bellingeriana		2	
Lomatium erythrocarpum	1		
Lomatium suksdorfii	5		
Luina serpentina	4		
Lupinus biddlei	8		
Mentzelia mollis	5		
Menzelia packardiae	8		
Mimulus hymenophyllus	1		
Mimulus jungermannioides	3		
Mimulus pygmaeus	1		
Mirabilis macfarlanei		39	
Penstemon barrettiae	33		
Penstemon peckii	201		
Perideridia erythrorhiza		7	
Phacelia lenta	3		
Pleuropogon oregonus	4		

Polemonium pectinatum	3			
Primula nevadensis	1			
Ranunculus reconditus	4			
Rorippa columbiae	1			
Senecio ertterae	9			
Sidalcea oregana var. calva	3			
Silene seelyi		4		
Silene spaldingii	23			1
Stephanomeria malheurensis	127			
Tauschia hooveri	1			
Thelypodium eucosmum	2			
Thelypodium howellii ssp. spectabilis	2			
Trifolium leibergii		2		
Trifolium owyheense	5			
Trifolium thompsonii		2		

* The number of accessions can indicate many things. In earlier years, some accessions from different plants in a population were accessioned together. Later, each plant from a population received a separate accession number.

Accession is split between the garden and the National Seed Storage Laboratory. May be more than one accession.

Table 4MGTPRACT. Categories of potential wildland management practices, as evaluated in expert panels on invertebrates ecology and management.

FOREST

I. Site Preparation
- A. Prescribed burning
  - 1. pile and burn
    - a. mechanical
    - b. hand
  - 2. jackpot
  - 3. broadcast
- B. Ripping
- C. Scarification
- D. Herbicides

II. Intermediate Entries
- A. Fertilization
  - 1. N
  - 2. K
- B. Precommercial thinning
- C. Pruning
- D. Vegetation management
  - 1. herbicide
  - 2. mechanical
  - 3. livestock grazing
- E. Commercial thinning

III. Regeneration methods
- A. Evenaged
  - 1. Clearcut
  - 2. Seed tree
  - 3. Shelterwood
- B. Unevenaged
  - 1. group
  - 2. individual tree
- C. ground vs. cable

IV. Other
- A. Grazing
- B. Harvesting of special forest products (eg. fungi, firewood)
- C. Pest management
  - 1. B.t.
  - 2. virus
  - 3. pheromones
- D. Exotics
  - 1. flora
  - 2. fauna
- E. Fire control
  - 1. borate
  - 2. backfire
  - 3. exclusion
- F. Amelioration of pest, fire, flood, wind and volcanic disturbance
  - 1. grass seeding
  - 2. salvage logging

V. Natural Disturbances
- A. Drought
- B. Wildfire
  - 1. groundfire
  - 2. stand replacement
- C. Insect outbreaks and disease activity
  - 1. bark beetles
  - 2. defoliators
  - 3. root rot
  - 4. mistletoe

RANGE

I. Grazing
- A. Grazing systems
  - 1. seasonal
  - 2. deferred
  - 3. rest rotation
- B. Juniper and sagebrush control
  - 1. mechanical
  - 2. herbicide
  - 3. fire
    - a. prescribed
    - b. wildfire

II. Other
- 'A. Harvesting of special products (eg. fungi, firewood)
- B. Pest management
- C. Exotics
  - 1. flora
    - a. herbicidal control
    - b. manual (grubbing)
    - c. biological control (insects, rusts, etc.)
    - d. grass seeding to prevent reinvasion after herbicide treatment.
  - 2. fauna
- D. Fire control,
  - 1. borate
  - 2. backfire
  - 3. exclusion
- E. Amelioration of pest, fire, flood, wind and volcanic disturbance

III. Natural Disturbances
- A. Drought-
- B. Wildfire
  - 1. groundfire
  - 2. stand replacement
- C. Insect outbreaks and disease activity

CONSIDERATIONS FOR ASSESSMENT

I. Temporal scale
- A. immediate <5 yrs

B. short term 550 yrs
C. long term >50 yrs

II. Spatial scale
A. stand
B. landsacape

III. Forest cover
A. LPP climax
B. PP climax
C. Dry mixed conifer DF, GF, PP, WL
D. Moist mixed conifer DF, WF, WL, WWP, LPP
E. High elevation mixed conifer ES, SAF, WBP, MH
F . Riparian/Wetlands

PP=Ponderosa pine
WL=Western larch
DF=Douglas fir
GF=Grand fir,
WF=White fir
LPP=Lodgepole pine
WWP=Western white pine
ES=Engleman spruce
SAF=Subalpine fir
WBP=Whitebark pine
MH=Mountain hemlock

IV. Range type
A. Juniper woodlands
B. Grasslands
1. m ountain
2. palouse
C. Shrublands
1. salt desert shrub
2. xeric sagebrush
3. mesic sagebrush
D. Riparian/Wetlands

V. Structural stage
A. Early
B. Stem exclusion
C. Reinitiation

VI. Season

VII. Intensity
A. severity
B. number of entries

VIII. Source of knowledge
A. Experimental data from C R B
B. Extrapolated from outside CRB
C. No experimental data

Appendix xx. Historical and current habitat area for select invertebrate species in the Interior Columbia River Basin based on vegetation types mapped from satellite imagery at a 1-km² pixel resolution.

Family	Species code	Scientific name	Common Name	Historic habitat (ha)	Current habitat (ha)	Change from historic (%)
Adelgidae	ADEPIC	*Adelges piceae*		2,706,400	6,091,900	125.1
Alydidae	ALYCAL	*Alydus calcaratus*		na	10,923,100	na
Anthocoridae	ORITRI	*Orius tristicolor*		43,245,400	37,754,600	-12.7
Anthocoridae	TETLAT	*Tetraphleps latipennis*		12,942,200	10,405,700	-19.6
Berytidae	JALWIC	*Jalysus wickhami*		23,952,900	35,252,200	47.2
Carabidae	NEBGFR	*Nebria gebleni fragariae*		545,600	544,500	-0.2
Carabidae	NEBVWY	*Nebria vandykei wyeast*	Wyeast's gazelle beetle	773,500	772,200	-0.2
Carabidae	PTEPRO	*Pterostichus protractus*		28,046,500	24,853,400	-11.4
Chriporelidae	CHRSCR	*Chrysomela scripta*	Cottonwood leaf beetle	409,300	160,000	-60.9
Cicindellidae	CICWEC	*Cicindela willisroni echo*		1,977,800	1,539,500	-22.2
Cicindellide	CICARE	*Cicindela arenicola*		138,300	138,300	0.0
Cicindellide	CICCOL	*Cicindela columbica*		683,900	682,800	-0.2
Cimicidae	CIMLET	*Cimex laripennis*		43,245,400	37,754,600	-12.7
Cleridae	ENOSPH	*Enoclenrs sphegeus*		20,869,300	21,754,800	4.2
Coccinellidae	HYPLAT	Hyperaspis lateralis		21,994,800	27,179,300	23.6
Coleophoridae	COLLAR	*Coleophora laricella*	Larch casebearer	2,132,700	1,369,800	-35.8
Coreidae	CHEVIT	*Chelinidea virriger*		16,701,600	11,571,700	-30.7
Coreidae	LEPOCC	*Leptoglossus occidentalis*		9,015,200	5,938,800	-34.1
Corixidae	CALAUD	*Callicorixa audeni*		545,600	544,500	-0.2
Corixidae	CORDEC	*Corisella decolor*		545,600	544,500	-0.2
Cydnidae	MICOBL	*Microponrs obliquus*		1,856,200	2,230,100	20.1
Dipriohidae	NEOFUL	*Neodiprion fulviceps*	Pine sawfly spp.	7,967,500	5,892,600	-26.0
Enicocephalidae	BORAME	*Boreostolus americanus*		545,600	544,500	-0.2
Formicidae	CAMMOD	*Camponotus modoc*	Carpenter ant	6,156,700	9,022,500	46.5
Formicidae	FOROBS	*Formica obscuripes*	Thatch ant	43,367,900	48,731,600	12.4

Gelastocoridae	GELOCU	*Gelastocoris oculatus*		545,600	544,500	-0.2
Gele?chiidae	COLMIL	*Coleotechnites milleri*	Lodgepole needle miner	4,430,200	4,227,900	-4.6
Geometridae	ALSPOM	***Alsophilo pometario***	Fall cankerworm	563,100	1,046,200	85.8
Geometridae	DREUNI	*Drepanulatrix unicalcararia*		172,700	100,200	-42.0
Gerridae	GERGIL	***Gerris** gillettei*		545,600	544,500	-0.2
Gnaphosidae/Araneida	ZELHEN	***Zelotes** hentzi*		21,994,800	27,179,300	23.6
Herbridae	HEBBUE	***Hebnrs** buenoi*		22,540,400	27,723,800	23.0
Hesperiidae	POLMAR	*Polites mardon*	Mardon skipper	172,700	100,200	-42.0
Lasiocampidae	MALDIS	Malacosoma disstria	Forest tent caterpillar	563,100	1,046,200	85.8
Leiodidae	GLABAT	***Glncicovicolo**bathyscoides*		138,300	138,300	0.0
Lumbricidae	ALLTUR	***Allolobophora** turgida*		21,994,800	16,256,200	-26.1
Lycaenidae	MITJOH	*Mitowra johnsoni*		7,967,500	5,892,600	-26.0
Lycosidae/Araneida	ARCLIT	*Arctosa littoralis*		545,600	544,500	-0.2
Lygaeidae	EURRUB	***Europiella nrbricornis***		1,293,900	856,700	-33.8
Lygaeidae	GASPAC	*Gastrodes pacificus*		3,754,300	4,782,800	27.4
Lygaeidae	GEOBUL	***Geocoris** bullatus*		31,234,300	30,116,900	-3.6
Lygaeidae	MALANG	*Malezonotus angustatus*		12,942,200	10,405,700	-19.6
Lymantriidae	ORGPSE	*Orgyia pseudotsugata*	Douglas-fir tussock moth	8,473,300	11,726,600	38.4
Meloidae	EPINOR	*Epicanta* ***normolis***		29,395,900	28,975,000	-1.4
Miridae	ADESUP	***Adelphocoris** superbus*		54,214,800	42,316,700	-21.9
Miridae	ATRBAL	*Atractotomus balli*		21,245,400	15,684,700	-26.2
Miridae	DERBRE	***Dereocoris brevis***		51,290,800	53,399,900	4.1
Miridae	DICSPP	***Dichoetocoris spp.***		na	10,923,100	na
Miridae	IRBPAC	***Irbisia** pacifica*		31,234,300	19,193,800	-38.5
Miridae	LABHES	***Labops** hesperius*		29,395,900	18,051,900	-38.6
Miridae	LOPNIG	*Lopidea* ***nigridea***		52,920,900	41,460,000	-21.7
Miridae	LYGELI	*Lygus elisus*		22,319,700	16,217,600	-27.3
Miridae	MYRORE	Myrmecophyes oregonensis		29,395,900	18,051,900	-38.6

Miridae	NEOXAN	***Neoborella xanrhenes***		12,397,700	10,120,500	-18.4
Miridae	PHYJUN	***Phytocoris juniperanus***		2,400,700	13,438,400	459.8
Miridae	PHYLAE	***Phytocoris laevis***		22,319,700	16,217,600	-27.3
Miridae	PHYLAT	***Phytocoris lattini***		545,600	544,500	-0.2
Miridae	PHYNIG	***Phyrocoris nigrolineatus***		20,481,300	25,998,800	26.9
Miridae	PHYSTE	***Phytocoris stellatus***		4,430,200	4,227,900	-4.6
Miridae	PHYYOL	***Phytocoris yollabollne***		3,754,300	4,782,800	27.4
Miridae	PILTIB	***Pilophonrs ribialis***		12,397,700	10,120,500	-18.4
Miridae	PLARUB	***Platylygus nrbripes***		12,397,700	10,120,500	-18.4
Nabidae	NABVAN	***Nabicula vanduzeei***		10,021,400	4,634,800	-53.8
Nabidae	NABALT	***Nabis alternatus***		23,952,900	24,329,100	1.6
Naucoridae	AMBMOR	***Ambrysus mormon***		22,540,400	16,800,700	-25.5
Noctuidae	SYNORO	***Syngrapha orophila***		172,700	100,200	-42.0
Notonectidae	NOTKIR	***Notonecta kirbyi***		545,600	544,500	-0.2
Nymphalidae	NYMANT	***Nymphalis antiopa***	Mourningcloak butterfly	409,300	160,000	-60.9
Olethrentidae	EUCSON	***Etrcosma sonomana***	Western pine shoot borer	12,397,700	10,120,500	-18.4
Papilionidae	PAPZEL	***Papilio zelicnon***		na	10,923,100	na
Papilionidae	PARCLO	***Pamnssius clodius***		138,300	138,300	0.0
Pentatomidae	CHLOPU	Chlorochroa opuntiae		16,701,600	11,571,700	-30.7
Pentatomidae	CODREM	***Codophiln remota***		21,994,800	27,179,300	23.6
Pentatomidae	ZICCAE	***Zicrona caerulea***		21,994,800	27,179,300	23.6
Phymatidae	PHYAME	***Phymata americana***		20,700,900	26,322,600	27.2
Pieridae	COLPEL	***Colins pelidne***		89,600	89,400	-0.2
Pieridae	NEOMEN	***Neophnsin menapia***	Pine butterfly	12,397,700	10,120,500	-18.4
Psendogarypidae/Chernilldal	PSEHES	***Pseudogarypus hesperus***		9,521,000	11,772,800	23.7
Reduviidae	SINDIA	***Sinea dindemn***		20,700,900	26,322,600	27.2
Rhopalidae	BOIRUB	***Boisea nrbrolineata***		545,600	544,500	-0.2
Rhopalidae	CHOSNO	***Chorosoma sp nov***		1,293,900	856,700	-33.8
Saldidae	IOSPOL	***Ioscylus polirus***		545,600	544,500	-0.2

Saldidae	MICFEN	*Micracanthia fennica*		22,540,400	27,723,800	23.0
Saldidae	SALBUE	*Salda buenoi*		545,600	544,500	-0.2
Salticidae	METAEN	*Metaphidipous aeneolus*	Jumping spider	18,554,400	19,143,000	3.2
Saturniidae	COLPAN	*Colorodia pnndorn*	Pandora moth	12,397,700	10,120,500	-18.4
Saturniidae	HEMHER	*Hemileuca hero*		na	10,923,100	na
Scolytidae	DENBRE	*Dendroctonus brevicomis*		9,015,200	5,938,800	-34.1
Scolytidae	DENPON	*Dendroctonus ponderosae*		17,894,700	14,240,600	-20.4
Scolytidae	DENPSE	*Dendroctonus pseudotsugae*		14,308,100	16,249,400	13.6
Scolytidae	DENRUF	Dendroctonus rufipennis		6,746,800	6,932,000	2.7
Scolytidae	SCOVEN	*Scolytus ventralis*		269,700	2,869,900	964.1
Scutelleridae	HOMBIJ	*Homaemus bijugis*		8,914,600	2,976,200	-66.6
Scutelleridae	TETROB	*Tetyra robusta*		1,106,800	1,658,600	49.9
Shore bug family?	SALEXP	*Saldula explanata*		3,754,300	4,782,800	27.4
Shore bug family?	SALNIG	*Saldula nigrita*		545,600	544,500	-0.2
Sphingidae	SPHVAS	*Sphinx vashti*		172,700	100,200	-42.0
Tenchodinidae	PRIERI	*Pristophorn erichsonii*	Larch sawfly	2,132,700	1,369,800	-35.8
Tenthredinidae	PONPAC	*Ponfania pacifica*	Gall-forming sawflies	409,300	160,000	-60.9
Theridildae/Araneida	LATHES	*Latrodectus hesperus*		22,539,300	27,464,500	21.9
Thyreocoridae	COREXT	*Corimelnena extensa*		31,234,300	19,193,800	-38.5
Tingidae	CORIMM	*Corythucha immaculata*		26,022,500	17,289,300	-33.6
Tingidae	CORMOL	*Coryrhucha molliculo*		545,600	544,500	-0.2
Tortricidae	CHOCON	*Choristoneura conflictana*	Large aspen tortrix	563,100	1,046,200	85.8
Tortricidae	CHOOCC	*Choristoneura occidentalis*	Western spruce budworm	6,340,600	10,356,800	63.3
Travuniidae/Phalangida	SPESEN	*Speleonychia sengeri*		138,300	138,300	0.0
Veliidae	MICBUE	*Microvelia buenoi*		545,600	544,500	-0.2
Veludae	RHADIS	*Rhagovelio distincta*		545,600	544,500	-0.2
Vespidae	VESPEN	*Vespula pensylvanica*	Western yellow jacket	55,818,500	54,315,500	-2.7
	NEORID	Neomis ridingsii		na	10,923,100	na

Appendix INVEHERB. Invertebrate species using open and closed grassland/herb structural stages in the assessment area of the Interior Columbia Basin Ecosystem Management Project. Species were determined from a select list of 206 inverterbate species representative of habitats and functions in the ICBEMP assessment area.

Family	Scientific name	Common name	Versa-tility
Alydidae	***Alydus calcaratus***		0
Geometridae	***Drepanulatrix unicalcararia***		0
Hesperiidae	***Polites mardon***	Mardon skipper	0
Miridae	***Dichaetocoris spp.***		0
Noctuidae	***Syngrapha orophila***		0
Papilionidae	***Papilio zelicaon***		0
Saturniidae	***Hemileuca hera***		0
Sphingidae	***Sphinx vashti***		0
	Neomis ridingsii		0
Cicindellidae	***Cicindela willistoni echo***		1
Lygaeidae	***Europiella rubricornis***		1
Rhopalidae	***Chorosoma sp nov***		1
Coreidae	***Chelinidea vittiger***		***2***
Pentatomidae	***Chlorochroa opuntiae***		***2***
Scutelleridae	***Homaemus bijugis***		***2***
Carabidae	***Pterostichus protractus***		***7***
Berytidae	***Jalysus wickhami***		***8***
Cydnidae	***Micropdrus obliquus .***		***8***
Formicidae	***Formica obscuripes***	Thatch ant	***8***
Miridae	***Phytocoris juniperanus***		***8***
Coccinellidae	***Hyperaspis lateralis***		***9***
Gnaphosidae/ Araneida	***Zelotes hentzi***		***9***
Herbridae	***Hebrus buenoi***		***9***
Lumbricidae	***Allolobophora turgida***		***9***
Lygaeidae	***Geocoris bullatus***		***9***
Meloidae	***Epicanta normalis***		***9***
Miridae	***Atractotomus balli***		***9***
Miridae	***Dereocoris brevis***		***9***
Miridae	***Irbisia pacifica***		***9***
Miridae	***Labops hesperius***		***9***
Miridae	***Lopidea nigridea***		***9***
Miridae	***Lygus elisus***		***9***
Miridae	***Myrmecophyes oregonensis***		***9***
Miridae	***Phytocoris l a e v i s***		***9***
Miridae	***Phytocoris nigrolineatus***		***9***

Nabidae	***Nabicula vanduzeei***		
Naucoridae	***Ambrysus monnon***		
Pentatomidae	***Codophila remota***		
Pentatomidae	***Zicrona caerulea***		
Phymatidae	***Phymata americana***		
Reduviidae	*Sinea diadema*		
Saldidae	***Micracanthia fennica***		
Theridildae/ Araneida	***Latrodectus hesperus***		
Thyreocoridae	***Corimelaena extensa***		
Tingidae	***Corythucha immaculata***		
Vespidae	***Vespula pensylvanica***	Western yellow jacket	
Anthocoridae	***Orius tristicolor***		***11***
Cimicidae	***Cimex latipennis***		11
Miridae	***Adelphocoris superbus***		11

.- Versatility rating denotes the number of other structural stages used by the species (11 maximum).

Appendix INVESHRB. Invertebrate species using open or closed, low-medium shrub structural stages in the assessment area of the Interior Columbia Basin Ecosystem Management Project. Species were determined from a select list of 206 invertebrate species representative of habitats and functions in the ICBEMP assessment area.

Familv	Scientific name	Common name	Versa-tility
Alydidae	*Alydus calcaratus*		0
Geometridae	*Drepanulatrix unicalcararia*		0
Hesperiidae	*Polites mardon*	Mardon skipper	0
Miridae	*Dichaetocoris spp.*		0
Noctuidae	*Syngrapha orophila*		0
Papilionidae	*Papilio zelicaon*		0
Saturniidae	*Hemileuca hera*		0
Sphingidae	*Sphinx vashti*		0
	Neomis ridingsii		0
Cicindellidae	*Cicindela willistoni echo*		1
Lygaeidae	*Europiella rubricornis*		1
Rhopalidae	*Chorosoma sp nov*		1
Coreidae	*Chelinidea vittiger*		2
Pentatomidae	*Chlorochroa opuntiae*		2
Scutelleridae	*Homaemus bijugis*		2
Carabidae	*Pterostichus protractus*		7
Berytidae	*Jalysus wickhami*		8
Cydnidae	*Microporus obliquus*		8
Formicidae	*Formica obscuripes*	Thatch ant	8
Miridae	*Phytocoris juniperanus*		8
Coccinellidae	*Hyperaspis lateralis*		9
Gnaphosidae/araneida	Zelotes hentzi		9
Herbridae	*Hebrus buenoi*		9
Lumbricidae	*Allolobophora turgida*		9
Lygaeidae	*Geocoris bullatus*		9
Meloidae	*Epicanta normalis*		9
Miridae	*Atractotomus balli*		9
Miridae	*Dereocoris brevis*		9
.Miridae	*Irbisia pacifica*		9
Miridae	*Labops hesperius*		9
Miridae.	*Lopidea nigridea*		9
Miridae	*Lygus elisus*		9
Miridae	*Myrmecophyes oregonensis*		9
Miridae	*Phytocoris laevis*		9

Miridae	*Phytocoris nigrolineatus*		9
Nabidae	*Nabicula vanduzeei*		9
Naucoridae	*Ambrysus mormon*		9
Pentatomidae	*Codophila remota*		9
Pentatomidae	*Zicrona caerulea*		9
Phymatidae	*Phymata americana*		9
Reduviidae	*Sinea diadema*		9
Saldidae	*Micracanthia fennica*		9
Theridildae/araneida	*Latrodectus hesperus*		9
Thyreocoridae	*Corimelaena extensa*		9
Tingidae	Corythucha immaculata		9
Vespidae	*Vespula pensylvanica*	Western yellow jacket	9
Anthocoridae	*Orius tristicolor*		11
Cimicidae	Cimex latipennis		11
Miridae	*Adelphocoris superbus*		11

.- Versatility rating denotes the number of other structural stages used by the species (11 maximum).

Appendix INVEOLDF. Invertebrate species using single- and multi-storied old forest structural stages in the assessment area of the Interior Columbia Basin Ecosystem Management Project. Species were determined from a select list of 206 inverterbate species representative of habitats and functions in the ICBEMP assessment area.

Family	Scientific name	Common name	Versa-tility
Dipriohidae	***Neodiprion fulviceps***	Pine sawfly spp.	0
Formicidae	***Camponotus modoc***	Carpenter ant	0
Lycaenidae	***Mitowra johnsoni***		0
Psendogarypidae/ Chernilldal	***Pseudogarypus hesperus***		0
Scolytidae	***Dendroctonus pseudotsugae***		0
Gelechiidae		Lodgepole needle miner	1
Saturniidae	***Coloradia pandora***	Pandora moth	1
Coleophoridae	***Coleophora laricella***	Larch casebearer	2
Coreidae	***Leptoglossus'occidentalis***		2
Lygaeidae	***Gastrodes pacificus***		2
Lygaeidae	***Malezonotus angustatus***		2
Lymantriidae	***Orgyia pseudotsugata***	Douglas-fir tussock moth	2
Pieridae	***Neophasia menapia***	Pine butterfly	2
Tortricidae	***Choristoneu'ra conflictana***	Large aspen tortrix	2
Tortricidae	***Choristoneura occidentalis***	Western spruce budworm	2
Adelgidae	***Adelges piceae***		3
Cleridae	***Enoclerus sphegeus***		3
Geometridae	***Alsophila pometaria***	Fall cankerworm	3
Lasiocampidae	***Malacosoma disstria***	Forest tent caterpillar	3
Miridae	***Neoborella xanthenes***		3
Miridae	***Phytocoris yollabollae***		3
Miridae	***Platylygus rubripes***		3
Scolytidae	***Dendroctonus brevicomis***		3
Scolytidae	***Dendroctonus ponderosae***		3
Scolytidae	***Dendroctonus rufipennis***		3
Scolytidae	***Scolytus ventralis***		3
Tenchodinidae	***Pristophora erichsonii***	Larch sawfly	3
Miridae	***Pilophorus tibialis***		4
Salticidae	***Metaphidipous aeneolus***	Jumping spider	4
Shore bug family?			4
Anthocoridae	***Tetraphleps latipennis***		5
Scutelleridae	***Tetyra robusta***		5
Carabidae	***Pterostichus protractus***		7

Berytidae	*Jalysus wickhami*		8
Cydnidae	*Microporus obliquus*		8
Formicidae	*Formica obscuripes*	Thatch ant	8
Miridae	*Phytocoris juniperanus*		8
Coccinellidae	*Hyperaspis lateralis*		9
Gnaphosidae/ Araneida	*Zelotes hentzi*		9
Herbridae	*Hebrus buenoi*		9
Lumbricidae	*Allolobophora turgida*		9
Lygaeidae	*Geocoris bullatus*		9
Meloidae	*Epicanta normalis*		9
Miridae	*Atractotomus balli*		9
Miridae	*Dereocoris brevis*		9
Miridae	*Irbisia pacifica*		9
Miridae	*Labops hesperius*		9
Miridae	*Lopidea nigridea*		9
Miridae	*Lygus elisus*		9
Miridae	*Mynnecophyes oregonensis*		9
Miridae	*Phytocoris laevis*		9
Miridae	*Phytocoris nigrolineatus*		9
Nabidae	*Nabicula vanduzeei*		9
Naucoridae	*Ambrysus* mormon		9
Pentatomidae	*Codophila remota*		9
Pentatom-idae	*Zicrona caerulea*		9
Phymatidae	*Phymata americana*		9
Reduviidae	*Sinea diadema*		9
Saldidae	*Micracanthia fennica*		9
Theridildae/ Araneida	*Latrodectus hesperus*		9
Thyreocoridae	*Corimelaena extensa*		9
Tingidae	*Corythucha immaculata*		9
Vespidae	*Vespula pensylvanica*	Western yellow jacket	9
Anthocoridae	*Orius tristicolor*		11
Cimicidae	*Cimex latipennis*		11
Miridae	*Adelphocoris superbus*		11

• - Versatility rating denotes the number of other structural stages used by the species (11 maximum).

Appendix VERTCAND. Summaries of vertebrate species with USFWS Candidate Cl or C2 status.

Larch Mountain salamander. Primarily a species found west of the Cascade crest in Washington and Oregon with few reports east of the Cascades. Primary habitat is moist talus associated with late succession coniferous forests. Threats to the species can be as a result of disturbance of suitable talus through mining activities (for road construction or other gravel sources) or trail and road construction. Disturbance of the talus during survey for the presence of salamanders can also result on drying out of the talus and reduction of prey.,

Western toad. Widespread across the CRB. Habitat is near wetlands, marshes and small ponds associated with dry forests or "shrubby" areas. Reported to be declining in parts of the range, e.g. southern Idaho, but populations seem stable in other areas. Development, including channelization of low elevation wet areas result in loss of habitat. Increases in ultraviolet radiation may also be a problem. Breeding habitat may be lost as a result of dam construction. Prior to dams, high water flows formed breeding pools when the water receded, regulated river flows as a result of dams prevent these habitats from forming.

Red-legged frog.

Tailed frog.

Cascades fro'g. Range overlaps with spotted frog and the two may compete and hybridize in some locations. They are most common in small pools adjacent to streams flowing through subalpine meadows. The species may be locally abundant but also absent from habitat that appears to be suitable. Introduction of predatory fish into frog breeding areas have been recognized as possible threats to the population. Increases in ultraviolet radiation and. effects on embryos is a possible threat. Livestock grazing may have an adverse effect on vegetation associated with breeding areas, but little work has been completed to document the effects.

Spotted frog. Populations east of the Cascades in Washington appear stable, but in Utah, Nevada and southwestern Idaho populations have declined. There have been proposals to divide the species into two, recongizing the difference between east and west of the Cascades.

Theats to the populations in southwestern Idaho include grazing, resulting from reduction of cover associated with wetlands and effects of urine and feces on water quality where cattle concentrations occur in riparian areas. Loss of habitat as a result of development and fragmentation of habitat which results in disruptions in movements within home ranges (between hibernaculum and breeding grounds). Springs are an'important habitat, providing sites for hibernacula. Development of the spring may prevent the use of the **area** by frogs since the natural surface flow (point where frogs enter to hibernate) is eliminated. Conversion of wetlands to irrigated pastures. Road construction presents threats in a variety of ways: direct 1033 of habitat to the road **or** during construction, traffic on roads results in direct mortality, roads may present barriers to movements and roads may contribute to increased sedimentation which degrades habitat. Construction of dams may permanentiy flood breeding sites above dams and because of regulated flows below the dam alter the seasonal high waters and prevent formation of pools suitable for breeding Introduction of bullfrogs and fish,. not native to the area, increases predation and has been detrimental to many species of amphibians.

Western least bittern.

White-faced ibis.

Trumpeter swan. A translocation effort was initiated in 1990 for southern Oregon, southeastern Idaho and western Wyoming. The primary wintering areas are in eastern Idaho and southwestern Montana and wintering populations have increased from approximately 200 in the 1930s to over 2500 in 1995. The Tri-State flock (Oregon, Idaho and Montana) increased as a result of artificial feeding, habitat protection and reduction in hunting. Between 1990 and 1994 the breeding population declined by approximately 50% and it was speculated a3 a result of terminating the artificial feeding program and translocations.

The primary threat to the population is habitat conversion from wetland3 to agriculture or other uses. Disturbance of incubating females from nests leaving the nest unattended and vulnerable to predation and temperature fluctuations. Lead poisoning has been a problem in some areas. Mis-identification of trumpeters for tundra swans and direct killing ha3 also been a problem.

Harlequin duck. Status in western states has been reported as stable to declining.

Northern goshawk. Population status of the goshawk is not clearly defined. Historical distribution and distribution is also poorly understood and few records or nest site locations were known prior to the 1960s (Thomas, et. al. 1995). The species was listed as a Candidate 2 species in 1992 (Fed. Register, Vol 57 #123) primarily as a result habitat alteration of primary habitat, late succession montane forests.

Habitat modification of nesting and/or foraging habitat is the primary threat for goshawks. This includes direct destruction of nest trees or reducing stem density or canopy closure. Long-term fire suppression with potential result of stand replacement fires in vegetation communities which historically had frequent low intensity firesis also a threat for habitat alteration. In some areas livestock grazing ha3 had adverse consequences to goshawks by reducing aspen regeneration (affecting potential nesting habitat) and alter3 forest understory vegetation which effects prey and hunting ability. Livestock use in riparian areasby removing or altering vegeation species composition and distribution also influence3 nesting and foraging habitat..

Ferruginous hawk. Populations have increased in parts of Montana, but decreased in Idaho. It is considered a threatened specie3 in Canada..

Threats are conversion of native areas, grassland3 and shrub-steppe, to agriculture. Egg contamination with pesticides, organophophates, PCBs and mercury have been reported for the species. Overuse by-livestock can result in loss of foraging or nesting haabitat..

Western sage grouse. In both Washington and Oregon populations have declined in the past several decades. In Washington, only two population center3 remain: northwestern Douglas County and the Yakima Firing Range in Kittitas and Yakima counties (each with approximately 300 birds) (Tirhi 1994). A 42% decrease in numbers of sage grouse using bBetween 14 and 20 leks were monitored was reported in Oregon between 1988 and 1993 (USDI, BLM 1994). It is not clear whether this is a distinct subspecies and different from population3 in Montana and Idaho, where populations have not declined a3 dramatically.

Threats to the Washington and Oregon population3 are primarily conversion of shrub-steppe habitat ot agriculture and residential/urban development. Recreational hunting, during declining populations can further reduce numbers. Livestock grazing can alter shrub-steppe communities and result in less

suitable habitat. Conversion of shrub-steppe to livestock forage species has contributed to declines of sage grouse. Pesticide use can influence insect populations important to young sage grouse.

Columbian sharp-tailed grouse. In Washington numbers of males on leks declined from 13 in 1954 to 5 in 1994 and numbers of leks declined 46%, 65% and 61% in Douglas, Okanogan and Lincoln counties respectively (Tirhi 1994). Populations have declined in Oregon and native populations may be extirpated. Restoration efforts through translocation efforts in Oregon have been largely unsuccessful.

As with sage grouse the primary threat is conversion of shrub-steppe habitat to agriculture or residential/urban development. Recreational hunting during declining population levels likely contributed to declines.

Black tern.

Burrowing owl.

Olive-sided flycatcher.

Willow flycatcher.

Loggerhead shrike.

Tricolored blackbird.

Preble's shrew.

Spotted bat.

Western small-footed myotis.

Long-eared myotis.

Fringed myotis.

Long-legged myotis.

Yuma myotis.

Pale western big-eared bat.

Pygmy rabbit. The population in eastern Washington has declined to only 5 populations in Douglas County.

The primary threat is conversion of sagebrush communities to agriculture, including livestock pastures and other losses, such as flooding as a result of dam construction.

Idaho ground squirrel.

Washington ground squirrel.

Potholes meadow vole.

Wolverine. Wolverine were petitioned to be listed as threatened under ESA. The status wes determined not warrented. Wolverines historically were widespread, but in low densities. Even where relatively abundant, they are difficult to observe and frequency of wolverine reports may be more related to human activity than to wolveine population density (Banci 1994).

Large, unroaded areas for seclusion are requied for wolverine persistence. Roading and increasing human activity into these areas is the primary threat. It is speculated that roads, at least higher traffic volume or multi-land roads, may be barriers to movement. Alteration of large refugia with intrusions of roads presents the largest threat to wolverine populatiions. Winter recreation, including snowmobiling and backcountry skiing, may result in displacement of females with young from rendezvous sites or from food caches.

Lynx. Lynx were petitioned to be listed as threatened in northcentral Washington under ESA. A determination of not warrented was made based on connection with a stable population in British Columbia and known emigration between the US and Canada. A followup petition for listing was made based on range-wide declines and concern for lynx. Recommendations by segments of the Fish and Wildlife Service as well as other biologists familiar with lynx were for listing, at least over portions of their range. Oregon Department of Fish and Wildlife consider lynx extirpated from the state, although an individual lynx was trapped in Oregon in 1993. Montana and Idaho have restricted trapping quotas for lynx.

Trapping, fire suppression and forest management pose threats to the population as do increased road access to unroaded areas and winter recreation. Most lynx populations in the CRB are peninsular extensions of suitable lynx habitat in Canada and fragmenting the habitat presents conservation threats.

Pacific fisher. Human activities, particularly trapping and forest management, have contributed to declines in fisher populations in western states, including the CRB (Powell and Zielinski 1994). Aubry and Houston (1992) reported fishers may be on the edge of extinction in Washington. Reports in southern Oregon during the past 5 years; presently research studies are underway to better understand fisher ecology in Oregon. Fishers have been augmented in Idaho and Montana and continue to be trapped in Montana.

Changes in forest structure are the primary threat to fisher persistence. Increases in road density may contribute to disturbance to fishers. Fragmentation of forests may result in isolated populations. Trapping contributes to population declines. Fisher may be taken inadvertantly during trapping for American marten.

Sagebrush lizard.

Appendix CARNIV. Legal status and harvest summaries of vertebrate carnivores in the interior CRB Assessment Area.

SPECIES/AREA	CLASSIFICATION	STATUS	HARVEST (YEAR)	HARVEST TREND
WOLF				
Eastern OR	Game Mammal	Protected	No harvest	—
Eastern WA	Game Mammal	Protected	No harvest	—
ID	Game Mammal	Protected	No harvest	—
Northwest MT	Game Mammal	Protected	No harvest	Occasional Incidental Take
COYOTE				
Eastern OR	Predatory Mammal	Unprotected	4500 (1994-1995)	Stable/Increasing (1985-1995)
Eastern WA	Predatory Mammal	Unprotected	1415 (1993-1994)	Stable/Increasing (1983-1994)
ID	Predatory Mammal	Unprotected	1825 (1993-1994)	Stable/Decreasing (1984-1994)
Northwest MT	Predatory Mammal	Unprotected	1198 (1993-1994)	Stable (1984-1994)
LYNX				
Eastern OR	Furbearer	Protected (extirpated)	No Harvest	—
Eastern WA	Furbearer	Protected (regulated harvest)	No Harvest (since 1991)	Decreasing (1970-1991)
ID	Furbearer	Regulated Harvest (quota)	1 (1993-1994)	Decreasing (1984-1994)
Northwest MT	Furbearer	Regulated Harvest (quota)	4 (1994-1995)	Decreasing (1984-1995)
MOUNTAIN LION				

Eastern OR	Game Mammal	Regulated harvest	93 (1992)	Increasing (1970-1992)
Eastern WA	Game Mammal	Regulated harvest	148 (1994-19945	Increasing (1989-1995)
ID	Game Mammal	Regulated harvest	448 (1993-1994)	Stable/Increasing (1988-1994)
Northwest MT	Game Mammal	Regulated harvest	258 (1993-1994)	Increasing (1984-1994)

BLACK BEAR

Eastern OR	Game Mammal	Regulated harvest	approx. 270 (1992)	Stable (1975-1992)
Eastern WA	Game Mammal	Regulated harvest	781 (1992-1993)	Stable (1984-1993)
ID	Game Mammal	Regulated harvest	1231 (1993--1994)	Stable/Increasing (1983-1994)
Northwest MT	Game Mammal	Regulated harvest	approx. 750 1993	Stable (1986-1993)

GRIZZLY BEAR

Eastern OR	Game Mammal	Protected (Extirpated)	No harvest	____
Eastern WA	Game Mammal	Protected	No harvest	____
ID	Game Mammal	Protected	No harvest	____
Northwest MT	Game Mammal	Protected	No harvest	Occasional Incidental Take

FISHER

Eastern OR	Furbearer	Protected	No harvest (since 1932)	—
Eastern WA	Furbearer	Protected	No harvest	—
ID	Furbearer	Protected	No harvest	Occasional incidental take
Northwest MT	Furbearer	Regulated harvest (quota)	8 (1994-1995)	Stable (1984-1995)

MARTEN				
Eastern OR	Furbearer	Regulated harvest	10 (1994-1995)	Decreasing (1985-1995)
Eastern WA	Furbearer	Regulated harvest	40 (1993-1994)	Decreasing (1983-1994)
ID	Furbearer	Regulated harvest	364 (1993-1994)	Decreasing (1984-1994)
Northwest MT	Furbearer	Regulated harvest	631 (1993-1994)	Decreasing (1984-1994)
WOLVERINE				
Eastern OR	Furbearer	Protected	No harvest	—
Eastern WA	Furbearer	Protected	No harvest	—
ID	Furbearer	Protected	No harvest	Occasional incidental take
Northwest MT	Furbearer	Regulated harvest	3 (1994-1995)	Stable (1984-1995)
RIVER OTTER				
Eastern OR	Furbearer	Regulated harvest	84 (1994-1995)	Stable (1985-1995)
Eastern WA	Furbearer	Regulated harvest	35 (1993-1994)	Stable/increasing (1983-1994)
ID	Furbearer	Protected	No harvest	Occasional incidental take
Northwest MT	Furbearer	Regulated harvest	26 (1994-1995)	Stable (1984-1994)

Appendix UNGULATES. Summary of management issues and key environmental correlates for 6 species of ungulates.

Information extracted from longer reports. Authors for the primary material were:

Elk:
Alan G. Christensen, USDA Forest Service, Region 1
L. Jack Lyon, USDA, Forest Service, Intermountain Res.Sta.
Mule deer and White-tailed deer:
Richard Pedersen, USDA Forest Service, Region 6
Bighorn sheep:
Walt L. Bodie, State of Idaha, Dept.of Game and Fish
Mountain goat:
Rolf Johnson, State of Washington, Dept.of Fish & Wildlife
Pronghorn (Antelope):
Bart O'Gara, USDI, Fish and Wildlife Service (retired)
Caribou:
Paul Harrington, USDA Forest Service, Idaho Panhandle National Forests

SPECIES	ISSUES	CORRELATES
ELK		
	Road Access	Road Density/occurrence Open road density by season summer/fall range roadless areas
	Vegetation Manipulation (Habitat Components)	Forested Acres Non-forested acres summer/fall range acres logged annually acres burned annually acres grazed (cattle allotments)
	Grazing	Summer/fall range Cattle Allotment3 Primary Range
	Security/refugia	Roadless areas Conifer Forest/patch Size Terrain Features Road densities Proximity to Human Development
	Winter Range	Aspect Elevation Snow Depth Ownership patterns
	Fire Management	Summer/fall Range Winter Range Wilderness fire plans fuel/fire models terrain features
	Vulnerability	Summer/fall range Open road density State management Guidelines Forested Acres
	Game Farms	Game Farm Locations
	Models/guidelines	Cover/vegetation

	Roads/access State Guidelines Bull:cow ratios Hunter density/seasons
ORV' s	Road Density Terrain Features Forested Acres summer/fall ranges Winter Range
Recreation	Road Density Trails/campsites Developed recreation sites Seasons of use by humans Summer/fall ranqe Human densities
Tribal Relationships	Tribal ownership patterns Treating hunting riqhts boundaries Proximity of Public lands Summer/fall range Winter range Road Densities
Land Ownership	Ownership Patterns Private/corporate management summer/fall ranqe winter range

MULE DEER

Foraqe	acres logged annually acres burned annually miles of road on winter ranqe human population density
Snow depth	snow depth 20 inches
Competition with livestock	acres of sheep allotments acres of cattle allotments
Fire management	acres prescribed fire acres wild fire
Logging	acres logged
Urban development	Human population density road density
Road access	none suggested
Poaching	Road density Human population density
Domestic dogs	none suggested
Highways Vehicle mortality	

WHITE-TAILED DEER

Forage	Shrub fields riparian zone abandoned farm fields
Snow depth	snow depth 20 inches
Competition	Moose range Livestock allotments Elk winter range

Fire management	acres prescribed fire acres wild fire
Loqqinq	acres loqqed, last 3-5 yrs
Urban development	Human population density Homes/cabin density adjacent to federal lands Recreation sites/mile of riparian Seasonal use at recreation sites Road density
Farm practices	acres of specific croplands ratio of agricultural land to successional habitat
Road access	Road density
Poaching	Road density Human population density
Domestic dogs Highways Vehicle mortality	none suqgested

BIGHORN SHEEP

Diseases	Domestic sheep allotments Livestock Allotments
Grazing	none suggested
Vegetation Manipulation	Seasonal Ranges Mixed shrub/grasslands Shrublands Potential habitat
Human Disturbance	Escape terrain Proximity to humans Seasonal Ranges
Vacant Habitat	Suitable habitat Domestic sheep allotments
Key Habitats	Winter range
Wilderness Hanaqement	Wilderness Hanqement Amount of habitat Aircraft Acces
Models	Topographic features Escape Terrain Human Activies Centers Bighorn population paramaters

MOUNTAIN GOAT

Road Access	Road Density Proximity to escape terrain Winter open road density
Veqetatfon Hanaqement	Cover/forage ratios Road density Proximity to escape terrain
Security	Proximity to escape terrain Road Density
Winter Range	Juxtaposition to winter range Rock/cliff habitat
Fire Manaqement	Let burn policy

	Prescribed burns
Harvest Manaqement	(none identified)
Predator/Prey Relationships	(none identified)
Competition (forage)	(none identified)
Recreation	Subdivsion/summer cabins Destination ski resorts

PRONGHORN ANTELOPE

Fencing	Livestock grazing allotments
Livestock grazing on ranqeland shared with pronghorn	Livestock grazing allotments Sprinq range
Predation and food for carnivores	Coyote populations Golden eagle Bobcat t-fountain lion
Improving deqraded ranqeland	Sub-climax veqetatlon Shrub encroachment
Habitat Models	Grass/forbs in spring Subclimax veqetatlon
Habitat Parameters favoring pronghorn	-low rolling to flat terrain -20-38 cm precipitation -snow dpeths under 30cm -grass/forb rangelands, <45 cm -open water sources

MOUNTAIN CARIBOU

Late Successional Stands	Western Cedar/Hemlock Englemann spruce/subalpine fir Ecotone habltat Acres of potential old-growth
Human Disturbance	Groomed Snowmobile trails Open Alpine assessable areas
Fire	Access manaqement Acres of non-target stands
Herd Augmentation	Public Acceptance Animal availability
Direct Mortality	Predator control Access manaqement Law enforcement Public education

Appendix VERTHERB. Vertebrate species using open and closed grassland/herb structural stages in the assessment area of the Interior Columbia Basin Ecosystem Management Project.

Family	Scientific name	Common name	Versatility
Ardeidae	***Bubulcus ibis***	Cattle egret	0
Gruidae	***Grus canadensis tabida***	Greater sandhill crane	0
Passeridae	***Passer domesticus***	House sparrow	0
Phasianidae	***Colinus virginianus***	Northern bobwhite	0
Phasianidae	***Phasianus colchicus***	Ring-necked pheasant	0
Muridae	***Mus muscul*** us	House mouse	0
Sciuridae	***Sciurus niger***	Eastern fox squirrel	0
Emberizidae	***Dolichonyx oryzivorus***	Bobolink	1
Strigidae	***Athene cunicularia***	Burrowing owl	1
Falconidae	***Falco mexicanus***	Prairie falcon	2
Falconidae	***Falco rusticolus***	Gyrfalcon	2
Fringillidae	***Leucosticte tephrocotis***	Gray-crowned rosy finch	2
Motacillidae	***Anthus rubescens***	American pipit	2
Phasianidae	***Tympanuchus phasianellus columbianus***	Columbian sharp-tailed grouse	2
Strigidae	***Asio flammeus***	Short-eared owl	2
Strigidae	***Nyctea scandiaca***	Snowy owl	2
Heteromyidae	***Perognathus longimembris***	Little pocket mouse	2
Vespertilionidae	***Pipistrellus hesperus***	Western pipistrelle	2
Colubridae	***Sonora semiannulata***	Ground snake	2
Iguanidae	***Crotaphytus bicinctores***	Mojave black-collared lizard	2
Accipitridae	***Circus cyaneus***	Northern harrier	3
Emberizidae	Amphispiza belli	Sage sparrow	3
Emberizidae	***Passerculus sandwichensis***	Savannah sparrow	3
Hirundinidae	***Tachycineta bicolor***	Tree swallow	3
Bovidae	***Bos bison***	American bison	3
Canidae	***Urocyon cinereoargenteus***	Common gray fox	3
Canidae	***Vulpes velox***	Kit fox	3
Molossidae	***Tadarida brasiliensis***	Brazilian free-tailed bat	3
Ochotonidae	***Ochotona princeps***	American pika	3
Soricidae	***Sorex merriami***	Merriam's shrew	3
Talpidae	***Scapanus latimanus***	Broad-footed mole	3
Accipitridae	***Buteo swainsoni***	Swainson's hawk	4
Emberizidae	***Ammodramus savannarum***	Grasshopper sparrow	4
Emberizidae	***Amphispiza bilineata***	Black-throated sparrow	4
Falconidae	***Falco sparverius***	American kestrel	4
Sciuridae	***Marmota caligata***	Hoary marmot	4
Sciuridae	***Spermophilus brunneus***	Idaho ground squirrel	4

Apodidae	***Chaetura vauxi***	Vaux's swift	5
Emberizidae	***Pooecetes gramineus***	Vesper sparrow	5
Emberizidae	***Sturnella neglecta***	Western meadowlark	5
Mimidae	*Oreoscoptes montanus*	Sage thrasher	5
Phasianidae	***Dendragapus obscurus***	Blue grouse	5
Cervidae	***Rangifer tarandus caribou***	Woodland caribou	5
Geomyidae	***Thomomys bottae***	Botta's pocket gopher	5
Heteromyidae	Dipodomys californicus	California kangaroo rat	5
Sciuridae	***Spennophilus armatus***	Uinta ground squirrel	5
Iguanidae	***Gambelia wislizenii***	Longnose leopard lizard	5
Ambystomatidae	***Ambystoma gracile***	Northwestern salamander	6
Accipitridae	***Buteo lagopus***	Rough-legged hawk	6
Emberizidae	***Geothlypis trichas***	Common yellowthroat	6
Emberizidae	***Spizella breweri***	Brewer's sparrow	6
Hirundinidae	***Progne subis***	Purple martin	6
Laniidae	***Lanius excubitor***	Northern shrike	6
Phasianidae	***Alectoris chukar***	Chukar	6
Phasianidae	***Callipepla californica***	California quail	6
Phasianidae	*Callipepla gambelii*	Gambel's quail	6
Phasianidae	***Perdix perdix***	Gray partridge	6
Picidae	***Melanerpes lewis***	Lewis' woodpecker	6
Picidae	***Sphyrapicus thyroideus***	Williamson's sapsucker	6
Troglodytidae	***Catherpes mexicanus***	Canyon wren	6
Troglodytidae	***Salpinctes obsoletus***	Rock wren	6
Antilocapridae	***Antilocapra americana***	Pronghorn	6
Bovidae	***Ovis canadensis californiana***	California bighorn sheep	6
Bovidae	***Ovis canadensis canadensis***	Rocky mountain bighorn sheep	6
Equidae	***Equus caballus***	Feral horse	6
Heteromyidae	***Dipodomys ordii***	Ord's kangaroo rat	6
Heteromyidae	***Perognathus parvus***	Great basin pocket mouse	6
Leporidae	Sylvilagus floridanus	Eastern cottontail	6
Leporidae	***Sylvilagus nuttallii***	Mountain cottontail	6
Muridae	***Neotoma lepida***	Desert woodrat	6
Muridae	***Onychomys leucogaster***	Northern grasshopper mouse	6
Muridae	***Peromyscus crinitus***	Canyon mouse	6
Muridae	***Phenacomys intermedius***	Heather vole	6
Sciuridae	***Ammospermophilus leucurus***	White-tailed antelope squirrel	6
Sciuridae	***Spennophilus beecheyi***	California ground squirrel	6
Sciuridae	***Spermophilus townsendii***	Townsend's ground squirrel	6
Sciuridae	***Spermophilus washingtoni***	Washington ground squirrel	6
Soricidae	*Sorex preblei*	Preble's shrew	6
Colubridae	***Masticophis taeniatus***	Striped whipsnake	6

Colubridae	*Rhinocheilus lecontei*	Longnose snake	6
Iguanidae	*Phrynosoma douglassii*	Short-horned lizard	6
Iguanidae	*Phrynosoma platyrhinos*	Desert horned lizard	6
Iguanidae	*Uta stansburiana*	Side-blotched lizard	6
Scincidae	*Eumeces skiltonianus*	Western skink	6
Teiidae	*Cnemidophorus tigris*	Western whiptail	6
Teiidae	*Cnemidophorus velox'*	Plateau striped whiptail	6
Pelobatidae	*Sped intermontana*	Great basin spadefoot	7
Accipitridae	*Accipiter striatus*	Sharp-shinned hawk	7
Emberieidae	*Vennivora ruficapilla*	Nashville warbler	7
Falconidae	*Falco columbarius*	Merlin	7
Hirundinidae	Hirundo pyrrhonota	Cliff swallow	7
Phasianidae	*Centrocercus urophasianus*	Sage grouse	7
Tyrannidae	*Sayornis saya*	Say's phoebe	7
Tyrannidae	*Tyrannus verticalis*	Western kingbird	7
Heteromyidae	*Dipodomys microps*	Chisel-toothed kangaroo rat	7
Heteromyidae	*Microdipodops megacephalus*	Dark kangaroo mouse	7
Leporidae	*Lepus townsendii*	White-tailed jackrabbit	7
Muridae	*Clethrionomys gapperi*	Southern red-backed vole	7
Sciuridae	*Mannota flaviventris*	Yellow-bellied marmot	7
Sciuridae	*Spermophilus columbianus*	Columbian ground squirrel	7
Accipitridae	*Aquila chrysaetos*	Golden eagle	8
Bombycillidae	*Bombycilla cedrorum*	Cedar waxwing	8
Columbidae	*Columba livia*	Rock dove	8
Emberizidae	*Chondestes grammacus*	Lark sparrow	8
Emberizidae	*Pheucticus melanocephalus*	Black-headed grosbeak	8
Emberizidae	*Seiurus noveboracensis*	Northern waterthrush	8
Laniidae	*Lanius ludovicianus*	Loggerhead shrike	8
Muscicapidae	*Catharus fuscescens*	Veery	8
Tyrannidae	*Empidonax oberholseri*	Dusky flycatcher	8
Tyrannidae	*Myiarchus cinerascens*	Ash-throated flycatcher	8
Tytonidae	*Tyto alba*	Common barn owl	8
Bovidae	*Oreamnos americanus*	Mountain goat	8
Geomyidae	*Thomomys mazama*	Western pocket gopher	8
Geomyidae	Thomomys talpoides douglasi	Brushprairie pocket gopher	8
Geomyidae	*Thomomys townsendii*	Townsend's pocket gopher	8
Mustelidae	*Mephitis mephitis*	Striped skunk	8
Sciuridae	*Spermophilus beldingi*	Belding's ground squirrel	8
Sciuridae	*Spennophilus elegans nevadensis*	Wyoming ground squirrel	8
Sciuridae	*Tamias minimus*	Least chipmunk	8
Vespertilionidae	*Antrozous pallidus*	Pallid bat	8

Iguanidae	***Sceloporus occidentalis***	Western. fence lizard	8
Bufonidae	***Bufo woodhousii***	Woodhouse's toad	9
Accipitridae	***Buteo jamaicensis***	Red-tailed hawk	9
Emberizidae	***Passerina amoena***	Lazuli bunting	9
Emberizidae	***Spizella passerina***	Chipping sparrow	9
Fringillidae	***Carduelis tristis***	American goldfinch	9
Hirundinidae	***Hirundo rustica***	Barn swallow	9
Hirundinidae	***Tachycineta thalassina***	Violet-green swallow	9
Phasinaidae	***Oreortyx pictus***	Mountain quail	9
Tyrannidae	***Contopus sordidul*** us	Western wood-pewee	9
Didelphidae	***Didelphis virginiana***	Virginia opossum	9
Geomyidae	***Thomomys talpoides***	Northern pocket gopher	9
Geomyidae	***Thomomys talpoides limosus***	White salmon pocket gopher	9
Leporidae	***Lepus americanus***	Snowshoe hare	9
Muridae	***Reithrodontomys megalotis***	Western harvest mouse	9
Procyonidae	***Procyon lotor***	Common raccoon	9
Sciuridae	Spermophilus saturatus	Cascade golden-mantled ground squirrel	9
Vespertilionidae	***Myotis evotis***	Long-eared myotis	9
Vespertilionidae	***Myotis thysanodes***	Fringed myotis	9
Anguidae	***Elgaria multicarinata***	Southern alligator lizard	9
Boidae	***Charina bottae***	Rubber boa	9
Colubridae	***Diadophis punctatus***	Ringneck snake	9
Colubridae	***Pituophis catenifer***	Gopher snake	9
Plethodontidae	***Ensatina eschscholtzii***	Ensatina	10
Accipitridae	***Buteo regalis***	Ferruginous hawk	10
Apodidae	*Cypseloides* ***niger***	Black swift	10
Charadriidae	***Charadrius vociferus***	Killdeer	10
Corvidae	***Corvus brachyrhynchos***	American crow	10
Cuculidae	***Coccyzus americanus***	Yellow-billed cuckoo	10
Emberizidae	*Junco* ***hyemalis***	Dark-eyed junco	10
Emberizidae	***Passerella iliaca***	Fox sparrow	1 0
Emberizidae	***Vermivora celata***	Orange-crowned warbler	10
Emberizidae	***Zonotrichia leucophrys***	White-crowned sparrow	10
Emberizidae	***Zonotrichia querula***	Harris' sparrow	10
Falconidae	***Falco peregrinus***	Peregrine falcon	10
Hirundinidae	***Stelgidopteryx serripennis***	Northern rough-winged swallow	10
Strigidae	***Otus kennicottii***	***Western*** screech owl	10
Trochilidae	***Archilochus alexandri***	Black-chinned hummingbird	10
Trochilidae	***Selasphorus rufus***	Rufous hummingbird	10
Trochilidae	Stellula calliope	Calliope hummingbird	10
Tyrannidae	***Tyrannus tyrannus***	Eastern kingbird	10
Canidae	***Vulpes vulpes***	Red fox	10
Cervidae	***Odocoileus*** *virginianus*	White-tailed deer	10

Muridae	*Microtus montanus*	Montane vole	10
Muridae	*Microtus pennsylvanicus*	Meadow vole	10
Mustelidae	*Gulo gulo*	Wolverine	10
Mustelidae	*Mustela erminea*	Ermine	10
Mustelidae	*Spilogale gracilis*	Western spotted skunk	10
Sciuridae	*Spermophilus lateralis*	Golden-mantled ground squirrel	10
Soricidae	*Sorex vagrans*	Vagrant shrew	10
Vespertilionidae	*Euderma maculatum*	Spotted bat	10
Vespertilionidae	*Myotis ciliolabrum*	Western small-footed myotis	10
Colubridae	*Contia* tenuis	Sharptail snake	10
Colubridae	*Hypsiglena torquata*	Night snake	10
Colubridae	*Lampropel* tis *zonata*	California mountain kingsnake	10
Ambystomatidae	*Ambystoma macrodactylum*	Long-toed salamander	11
Ambystomatidae	*Ambystoma tigrinum*	Tiger salamander	11
Hylidae	*Pseudacris regilla*	Pacific chorus frog	11
Hylidae	*Pseudacris triseriata*	Western chorus frog	11
Apodidae	*Aeronautes saxatalis*	White-throated swift	11
Caprimulgidae	*Chordeiles minor*	Common nighthawk	11
Cathartidae	*Cathartes aura*	Turkey vulture	11
Columbidae	Zenaida macroura	Mourning dove	11
Corvidae	*Pica pica*	Black-billed magpie	11
Emberizidae	*Icteria virens*	Yellow-breasted chat	11
Emberizidae	*Icterus galbula*	Northern oriole	11
Emberizidae	*Molothrus ater*	Brown-headed cowbird	11
Muscicapidae	*Myadestes townsendi*	Townsend's solitaire	11
Muscicapidae	*Sialia currucoides*	Mountain bluebird	11
Muscicapidae	*Sialia mexicana*	Western bluebird	11
Muscicapidae	*Turdus migratorius*	American robin	11
Picidae	*Colaptes auratus*	Northern flicker	11
Strigidae	*Asio otus*	Long-eared owl	11
Strigidae	*Bubo virginianus*	Great horned owl	11
Trochilidae	*Selasphorus platycercus*	Broad-tailed hummingbird	11
Troglodytidae	*Troglodytes aedon*	House wren	11
Canidae	*Canis la* trans	Coyote	11
Canidae	*Canis lupus*	Gray wolf	11
Cervidae	*Cervus elaphus nelsonii*	'Rocky mountain elk	11
Cervidae	*Odocoileus hemionus*	Mule deer	11
Erethizontidae	*Erethizon dorsatum*	Common porcupine	11
Felidae	*Felis concolor*	Mountain lion	11
Felidae	*Lynx rufus*	Bobcat	11
Muridae	*Microtus longicaudus*	Long-tailed vole	11
Muridae	*Neotoma cinerea*	Bushy-tailed woodrat	11

Muridae	Peromyscus keenii	Columbian mouse	11
Muridae	***Peromyscus maniculatus***	Deer mouse	11
Mustelidae	***Mustela frenata***	Long-tailed weasel	11
Mustelidae	*Taxidea taxus*	American badger	11
Soricidae	***Sorex cinereus***	Masked shrew	11
Ursidae	***Ursus americanus***	Black bear	11
Ursidae	***Ursus*** *arctos*	Grizzly bear	11
Vespertilionidae	***Eptesicus fuscus***	Big brown bat	11
Vespertilionidae	***Lasionycteris noctivagans***	Silver-haired bat	11
Anguidae	***Elgaria coerulea***	Northern alligator lizard	11
Colubridae	***Coluber constrictor***	Racer	11
Colubridae	***Thamnophis elegans***	Western terrestrial garter snake	11
Colubridae	***Thamnophis sirtalis***	Common garter snake	11
Viperidae	***Crotalus*** *viridis*	Western rattlesnake	11

. – Versatility rating denotes the number of other structural stages used by the species (11 maximum).

Appendix VERTSHRB. Vertebrate species using open or closed, low-medium shrub structural stages *in* the assessment area of the Interior Columbia Basin Ecosystem Management Project.

Family	Scientific name	Common name	Versa-tility
Phasianidae	*Lagopus leucurus*	White-tailed ptarmigan	0
Leporidae	*Brachylagus iddhoensis*	Pygmy rabbit	0
Emberitidae	*Dolichonyx oryzivorus*	Bobolink	1
Strigidae	*Athene cunicularia*	Burrowing owl	1
Falconidae	*Falco* mexicanus	Prairie falcon	2
Falconidae	*Falco rusticolus*	Gyrfalcon	2
Fringillidae	*Leucosticce* Cephrococis	Gray-crowned rosy finch	2
Motacillidae	*Anthus rubescens*	American pipit	2
Phasianidae	*Tympanuchus phasianellus columbianus*	Columbian sharp-tailed grouse	2
Striqidae	*Asio flammeus*	Short-eared owl	2
Striqidae	*Nyctea scandiaca*	Snowy owl	2
Heteromyidae	Perogna *thus longimembris*	Little pocket mouse	2
Vespertilionidae	*Pipistrellus hesperus*	Western pipistrelle	2
Colubridae	*Sonora semidnnulatd*	Ground snake	2
Iquanidae	*Crotdphytus* bicinccores	Mojave black-collared lizard	2
Accipitridae	*Circus cyaneus*	Northern harrier	3
Emberizidae	*Amphispiza belli*	Saqe sparrow	3
Emberizidae	*Passerculus sandwichensis*	Savannah sparrow	3
Hirundinidae	*Tachycineta* bicolor	Tree swallow	3
Paridae	*Parus rufescens*	Chestnut-backed chickadee	3
Picidae	Dryocopus *piledtus*	Pileated woodpecker	3
Bovidae	*Bos bison*	American bison	3
Canldae	Urocyon *cinereodrgenteus*	Common gray fox	3
Canidae	*Vulpes velox*	Kit fox	3
Holossidae	*Tdddridd* brasiliensis	Brazllian‘free-tailed bat	3
Ochotonidae	*Ochotond princeps*	American pika	3
Soricidae	*Sorex merriami*	Merriam's shrew	3
Talpidae	*Scdpdnus latimanus*	Broad-footed mole	3
Accipitridae	*Buteo swainsoni*	Swainson's hawk	4
Alcidae	*Erachyrdmphus marmoratus*	Marbled murrelet	4
Emberizidae	*Ammodrdmus savannarum*	Grasshopper sparrow	4
Emberizidae	*Amphispizd bilinedta*	Black-throated sparrow	4
Falconidae	*Falco spdrverius*	American kestrel	4
Phasianidae	*Bonasa umbellus*	Ruffed grouse	4
Striqidae	*Aegolius acadicus*	Northern saw-whet owl	4
Strigidae	Strix *varia*	Barred owl	4
Troqlodytldae	*Troglodytes troglodytes*	Winter wren	4
Tyrannidae	*Empidonax vriqhtii*	Gray flycatcher	4
Muridae	*Lemmiscus* curtdtus	Sagebrush vole	4
Muridae	*Peromyscus truei*	Pinyon mouse	4
Sciuridae	*Glaucomys sabrinus*	Northern flying squirrel	4
Sciuridae	*Marmota caligata*	Hoary marmot	4
Sciuridae	*Spermophilus brunneus*	Idaho ground squirrel	4
Iquanidae	Sceloporus grdciosus grdciosus	Saqebrush lizard	4
Apodidae	*Chaeturd vauxi*	Vaux's swift	5
Emberizidae	*Pooecetes* grdmineus	Vesper sparrow	5
Emberizidae	*Sturnella* neglectd	Western meadowlark	5
Mimidae	Oreoscoptes *mon tanus*	Sage thrasher	5
Phasianidae	*Dendragapus obscurus*	Blue grouse	5
Phasianidae	*Meleagris gdllopdvo*	Wild turkey	5
Vireonidae	*Vireo olivaceus*	Red-eyed vi reo	5

Cervidae	*Rangifer cardndus caribou*	Woodland caribou	5
Geomyidae	*Thomomys bottae*	Botta's pocket gopher	5
Heteromyidae	*Dipodomys californicus*	California kangaroo rat	5
Sciuridae	*Spermophilus armacus*	Uinta ground squirrel	5
Iquanidae	*Gambelia wislizenii*	Longnose leopard lizard	5
Accipitridae	*Buteo lagopus*	Rough-legged hawk	6
Corvidae	*Corvus corax*	Common raven	6
Emberizidae	*Dendroica petechia*	Yellow warbler	6
Emberizidae	*Geothlypis trichas*	Common yellowthroat	6
Emberizidae	*Setophaga ruticilla*	American redstart	6
Emberizidae	Spi *zella breweri*	Brewer's sparrow	6
Fringillidae	*Carduel* is *psal* tria	Lesser goldfinch	6
Hirundinidae	*Progne subis*	Purple martin	6
Laniidae	*Lanius excubitor*	Northern shrike	6
Mimidae	*Dumetella carolinensis*	Gray catbird	6
Mimidae	*Mimus polyglottos*	Northern mockingbird	6
Muscicapidae	*Catharus guttatus*	Hermit thrush	6
Muscicapidae	*Ixoreus naevi us*	Varied thrush	6
Phasianidae	*Alectoris chukar*	Chukar	6
Phasianidae	*Callipepla californica*	California quail	6
Phasianidae	*Callipepla gambelii*	Gambel's quail	6
Phasianidae	*Perdix perdix*	Gray partridge	6
Plcidae	Melanerpes *lewis*	Lewis' woodpecker	6
Picidae	Picoides *pubescens*	Downy woodpecker	6
Picidae	*Sphyrapicus nuchdlis*	Red-naped sapsucker	6
Picidae	*Sphyrapicus thyroideus*	Williamson's sapsucker	6
Sittidae	*Sitta canadensis*	Red-breasted nuthatch	6
Troqlodytidae	*Catherpes mexicanus*	Canyon wren	6
Troglodytidae	*Salpinctes obsoletus*	Rock wren	6
Antilocapridae	*Antilocapra* americana	Pronghorn	6
Bovidae	Ovis *canadensis* californiana	California bighorn sheep	6
Bovidae	Ovis *canadensis canadensis*	Rocky mountain bighorn sheep	6
Equidae	*Equus caballus*	Feral horse	6
Heteromyidae	*Dipodomys ordii*	Ord's kangaroo rat	6
Heteromyidae	*Perognathus parvus*	Great basin pocket mouse	6
Leporidae	*Sylvilagus floridanus*	Eastern cottontail	6
Leporidae	*Sylvilagus nuttallii*	Mountain cottontail	6
Huridae	*Neotoma lepida*	Desert woodrat	6
Huridae	*Onychomys* leucogaster	Northern grasshopper mouse	6
Huridae	*Peromyscus crinitus*	Canyon mouse	6
Muridae	*Phenacomys* intermedius	Heather vole	6
Sciuridae	*Ammospermophilus leucurus*	White-tailed antelope squirrel	6
Sciuridae	*Spermophilus beecheyi*	California ground squirrel	6
Sciuridae	*Spermophilus townsendi* i	Townsend's ground squirrel	6
Sciuridae	*Spermophilus* washingtoni	Washington ground squirrel	6
Soricidae	*Sorex monticolus*	Hontane shrew	6
Soricidae	*Sorex prebl* ei	Preble's shrew	6
Colubridae	*Masticophis* taeniatus	Striped whipsnake	6
Colubridae	*Rhinocheilus* lecontei	Longnose snake	6
Iguanidae	*Phrynosoma douglassi* i	Short-horned lizard	6
Iguanidae	*Phrynosoma pla tyrhinos*	Desert horned lizard	6
Iguanidae	*Uta stansburiana*	Side-blotched lizard	6
Scincidae	*Eumeces skiltonianus*	Western skink	6
Teiidae	*Cnemidophorus* tigris	Western whiptail	6
Teiidae	*Cnemidophorus velox*	Plateau striped whiptail	6
Pelobatidae	*Spea intermontana*	Great basin spadefoot	1
Accipitridae	*Accipiter striatus*	Sharp-shlnned hawk	7
Emberizidae	*Piranga ludoviciana*	Western tanager	1

Emberizidae	*Vermi* vora *peregrina*	Tennessee warbler	7
Emberiiidae	*Vermivora ruficapilla*	Nashville warbler	7
Emberiiidae	*Wilsonia pusilla*	Wilson's warbler	7
Falconidae	*Falco columbarius*	Merlin	7
Fringillidae	*Cdrpodacus cdssinii*	Cassin's finch	7
Fringillidae	*Coccothraustes vespertinus*	Evening grosbeak	7
Frlnqillidae	*Pinicold enucleator*	Pine grosbeak	7
Hirundinidae	Hirundo *pyrrhonota*	Cliff swallow	7
Phasianidae	Centrocercus urophasianus	Sage grouse	1
Picidae	*Picoides villosus*	Hairy woodpecker	7
Sittidae	Sit *ta carol inensi s*	White-breasted nuthatch	7
Strigidae	Surnia *ul ula*	Northern hawk owl	7
Tyrannidae	Contopus *borealis*	Olive-sided flycatcher	7
Tyrannidae	*Empi donax* hdmmondii	Hammond's flycatcher	7
Tyrannidae	*Sayornis saya*	Say's phoebe	7
Tyrannidae	*Tyrannus verticalis*	Western kingbird	7
Vlreonidae	Vireo *gilvus*	Warbling vireo	1
Vireonidae	Vireo *soli* tarius	Solitary vireo	7
Cervidae	*Alces alces*	Moose	1
Heteromyidae	Dipodomys mi *crops*	Chisel-toothed kangaroo rat	7
Heteromyidae	*Microdipodops megacephalus*	Dark kangaroo mouse	1
Leporidae	Lepus *townsendi* i	White-tailed jackrabbit	7
Muridae	*Clethrionomys* gapperi	Southern red-backed vole	7
Muridae	*Microtus pennsylvdnicus kincaidi*	Potholes meadow vole	7
Sciuridae	*Marmota* flaviventris	Yellow-bellied marmot	7
Sciurldae	*Spermophilus columbianus*	Columbian ground squirrel	1
Talpidae	*Scapanus* ordrius	Coast mole	7
Vespertilionldae	Lasiurus *cinereus*	Hoary bat	1
Vespertllionidae	*Myotis* volans	Long-legged myotis	1
Accipitridae	*Accipiter cooperi* i	Cooper's hawk	8
Accipitridae	*Accipiter gentilis*	Northern goshawk	8
Accipitridae	*Aquila chrysaetos*	Golden eagle	8
Bombycillidae	*Bombycilla cedrorum*	Cedar waxwing	8
Columbidae	*Columba livia*	Rock dove	8
Emberizidae	*Chondes* tes *grammacus*	Lark sparrow	8
Emberizidae	Dendroica *coronata*	Yellow-rumped warbler	8
Emberizidae	*Pheucticus melanocephalus*	Black-headed grosbeak	8
Emberizidae	Seiurus noveboracensis	Northern waterthrush	8
Lanlidae	Lanius *ludovicianus*	Loggerhead shrike	8
Muscicapidae	*Catharus fuscescens*	Veery	8
Muscicapidae	*Catharus ustulatus*	Swainson's thrush	8
Paridae	*Parus* atricapillus	Black-capped chickadee	8
Tyrannidae	*Empidonax oberholseri*	Dusky flycatcher	8
Tyrannidae	*Myiarchus cinerascens*	Ash-throated flycatcher	8
Tytonidae	*Tyto alba*	Common barn owl	8
Bovidae	*Oreamnos americanus*	Mountain goat	8
Geomyidae	*Thomomys mazama*	Western pocket gopher	8
Geomyidae	*Thomomys talpoides douglasi*	Brushprairie pocket gopher	8
Geomyidae	*Thomomys townsendi* i	Townsend's pocket gopher	8
Mustelidae	*Mephitis mephitis*	Striped skunk	8
Sciuridae	*Spermophilus beldingi*	Belding's ground squirrel	8
Sciuridae	*Spermophilus elegans* nevadensis	Wyoming ground squirrel	8
Sciuridae	*Tamias minimus*	Least chipmunk	8
Vespertilionidae	*Antrorous pallidus*	Pallid bat	8
Iguanidae	*Sceloporus occidentalis*	Western fence lizard	8
Bufonidae	*Bufo woodhousi* i	Woodhouse's toad	9
Accipitridae	*Buteo* jamaicensis	Red-tailed hawk	9
Emberizidae	Oporornis tolmiei	Macgillivray's warbler	9

Emberizidae	*Passerina dmoend*	Lazuli bunting	9
Emberiiidae	*Pheucticus ludovicianus*	Rose-breasted grosbeak	9
Emberiiidae	*Spizella passerind*	Chipping **sparrow**	9
Fringillidae	*Carduelis triscis*	American goldfinch	9
Hirundinidae	*Hirundo rustica*	**Barn** swallow	9
Hirundinidae	Tachycineta *thalassina*	Violet-green swallow	9
Phasinaidae	*Oreortyx pictus*	**Mountain** quail	9
Tyrannidae	*Concopus sordidulus*	Western wood-pewee	9
Tyrannidae	*Empidonax* traillii	Willow flycatcher	9
Didelphidae	*Didelphis* virginiana	Virginia opossum	9
Geomyidae	*Thomomys talpoides*	Northern pocket gopher	9
Geomyidae	*Thomomys talpoides limosus*	White salmon pocket gopher	9
Leporidae	*Lepus americanus*	Snowshoe hare	9
Muridae	*Reithrodontomys megalotis*	Western harvest mouse	9
Procyonidae	*Procyon lotor*	**Common** raccoon	9
Sciuridae	*Spermophilus saturatus*	Cascade golden-mantled ground squirrel	9
Vespertilionidae	*Myotis evotis*	**Long-eared myotis**	9
Vespertilionidae	*Myotis thysanodes*	Fringed **myotis**	9
Anguidae	*Elgaria multicarinata*	Southern alligator lizard	9
Boidae	Charina *bottae*	Rubber boa	9
Colubridae	*Dia,dophis punctatus*	**Ringneck** snake	9
Colubrldae	*Pituophis* catenifer	Gopher snake	9
Plethodontidae	Ensacina *eschscholtzii*	Ensatlna	10
Accipitridae	Buteo *regalis*	Ferruginous hawk	10
Apodidae	*Cypseloides* niger	Black swift	10
Charadriidae	*Charadrius vociferus*	**Killdeer**	10
Corvidae	*Corvus brachyrhynchos.*	American crow	10
Cuculidae	*Coccyzus americanus*	Yellow-billed cuckoo	10
Emberizidae	*Junco hyemal* is	Dark-eyed **junco**	10
Emberizidae	*Passerell a il iaca*	Fox **sparrow**	10
Emberizidae	Vermivord *celata*	Orange-crowned warbler	10
Emberizidae	*Zonotrichia leucophrys*	**White-crowned** sparrow	10
Emberizidae	*Zonotrichia querula*	Harris' **sparrow**	10
Falconidae	*Fal* co *peregrinus*	Peregrine falcon	10
Hirundinidae	Stelgidopteryx *serripennis*	Northern rough-winged swallow	10
Strigidae	*Otus kennicottii*	Western **screech owl**	10
Trochilidae	*Archilochus alexandri*	Black-chinned hummingbird	10
Trochilidae	*Selasphorus rufus*	Rufous hummingbird	10
Trochilidae	*Stellula calliope*	Calliope hummingbird	10
Tyrannidae	*Tyrannus tyrannus*	*Eastern* kingbird	10
Canidae	*Vulpes vulpes*	Red fox	10
Cervidae	*Odocoileus* virginianus	White-tailed **deer**	10
Muridae	*Microtus* montanus	**Montane vole**	10
Huridae	*Microtus pennsylvanicus*	**Meadow vole**	10
Mustelidae	*Gulo gulo*	**Wolverine**	10
Mustelidae	*Mustela erminea*	**Ermine**	1 0
Mustelidae	*Spilogale gracilis*	**Western** spotted skunk	10
Sciuridae	*Spermophilus* lateralis	Golden-mantled ground squirrel	10
Soricidae	*Sorex* vagrans	Vagrant shrew	10
Vespertilionidae	*Euderma maculatum*	Spotted **bat**	10
Vespertilionidae	*Myotis ciliolabrum*	*Western* small-footed **myotis**	10
Colubridae	*Contia tenuis*	Sharptail snake	10
Colubridae	*Hypsiglena torquata*	Night **snake**	10
Colubridae	*Lampropel* tis *zonata*	California mountain kingsnake	10
Ambystomatidde	*Ambystoma macrodactylum*	Long-toed salamander	11
Ambystomatidae	*Ambystoma* tigrinum	Tiger salamander	11
Hylidae	*Pseudacris regilla*	Pacific chorus frog	11

Hylidae	*Pseudacris triseriata*	Western chorus froq	11
Apodidae	*Aeronautes saxatalis*	White-throated swift	11
Caprimulgidae	*Chordeiles minor*	Common nighthawk	11
Cathartidae	*Cathartes aura*	Turkey vulture	11
Columbidae	*Zenaida macroura*	Mourning dove	11
Corvidae	*Pica pica*	Black-billed maqpie	11
Emberizidae	*Icteria virens*	Yellow-breasted chat	11
Emberizidae	*Icterus galbula*	Northern oriole	11
Emberizidae	*Molothrus ater*	Brown-headed cowbird	11
Muscicapidae	*Myadestes* townsendi	Townsend's solitaire	11
Muscicapidae	*Sialia* currucoides	Mountain bluebird	11
Muscicapidae	Sidlia *mexicana*	Western bluebird	11
Muscicapidae	*Turdus migratorius*	American robin	11
Plcidae	*Colaptes auratus*	Northern flicker	11
Striqidae	Asio *otus*	Long-eared owl	11
Striqidae	*Bubo* virginianus	Great horned owl	11
Trochilidae	*Selasphorus pla tycercus*	Broad-tailed hummingbird	11
Troqlodytidae	Troglodytes *aedon*	House wren	11
Canidae	*Canis latrans*	Coyote	11
Canidae	*Canis* 1 *upus*	Gray wolf	11
Cervidae	*Cervus elaphus* nelsonii	Rocky mountain elk	11
Cervidae	Odocoileus hemionus	Mule deer	11
Erethizontidae	*Erethizon* dorsacum	Common porcupine	11
Felidae	*Felis concolor*	Mountain lion	11
Felidae	*Lynx rufus*	Bobcat	11
Muridae	*Microtus* longicaudus	Long-tailed vole	11
Muridae	*Neotoma cinerea*	Bushy-tailed woodrat	11
Huridae	Peromyscus keenii	Columbian mouse	11
Huridae	*Peromyscus maniculatus*	Deer mouse	11
Mustelidae	*Mustela frenata*	Long-tailed weasel	11
Mustelidae	*Taxidea taxus*	American badger	11
Soricidae	*Sorex cinereus*	Masked shrew	11
Ursldae	*Ursus americanus*	Slack bear	11
Ursldae	*Ursus* arctos	Grizzly bear	11
Vespertilionidae	*Eptesicus fuscus*	Big brown bat	11
Vespertilionidae	Lasionycteris noctivagans	Silver-haired bat	11
Anguidae	*Elgaria coerulea*	Northern alligator lizard	11
Colubrldae	*Coluber* constrictor	Racer	11
Colubridae	*Thamnophis elegans*	Western terrestrial garter snake	11
Colubridae	*Thamnophis sirtalis*	Common qarter snake	11
Viperidae	*Crotalus viridis*	Western rattlesnake	11

• – Versatility rating denotes the number of other structural stages used by the species (11 maximum).

Appendix VERTOLDF. Vertebrate species using single- and multi-storied old forest structural stages in the assessment area of the Interior Columbia Basin Ecosystem Management Project.

Family	Scientific name	Common name	Versatility
Strigidae	*Otus flammeolus*	Flammulated owl	0
Certhiidae	*Certhia americana*	Brown creeper	1
Columbidae	*Columba fasciata*	Band-tailed pigeon	1
Fringillidae	*Loxia leucoptera*	White-winged crossbill	1
Strigidae	*Aegolius funereus*	Boreal owl	1
Sciuridae	*Sciurus griseus*	Western gray squirrel	1
Plethodontidae	*Batrachoseps wrighti*	Oregon slender salamander	2
Corvidae	*Nucifraga columbiana*	Clark's nutcracker	2
Emberizidae	*Dendroica townsendi*	Townsend's warbler	2
Fringillidae	*Loxia curvirostra*	Red crossbill	2
Muscicapidae	*Regulus satrapa*	Golden-crowned kinglet	2
Paridae	*Parus hudsonicus*	Boreal chickadee	2
Paridae	*Parus inornatus*	Plain titmouse	2
Phasianidae	*Dendragapus canadensis*	Spruce grouse	2
Picidae	*Melanerpes erythrocephalus*	Red-headed woodpecker	2
Picidae	*Picoides arcticus*	Black-backed woodpecker	2
Strigidae	*Glaucidium gnoma*	Northern pygmy-owl	2
Strigidae	*Strix nebulosa*	Great gray owl	2
Tyrannidae	*Empidonax occidentalis*	Cordilleran flycatcher	2
Muridae	*Clethrionomys californicus*	Western red-backed vole	2
Sciuridae	*Tamias dorsalis*	Cliff chipmunk	2
Sciuridae	*Tamiasciurus douglasii*	Douglas' squirrel	2
Sciuridae	*Tamiasciurus hudsonicus*	Red squirrel	2
Corvidae	*Gymnorhinus cyanocephalus*	Pinyon jay	3
Corvidae	*Perisoreus canadensis*	Gray jay	3
Muscicapidae	*Regulus calendula*	Ruby-crowned kinglet	3
Paridae	*Parus rufescens*	'Chestnut-backed chickadee	3
Picidae	*Dryocopus pileatus*	Pileated woodpecker	3
Picidae	*Picoides albolarvatus*	White-headed woodpecker	3
Picidae	*Picoides tridactylus*	Three-toed woodpecker	3
Sittidae	*Sitta pygmaea*	Pygmy nuthatch	3
Muridae	*Microtus oregoni*	Creeping vole	3
Mustelidae	*Martes americana*	American marten	3
Mustelidae	*Martes pennanti*	Fisher	3
Sciuridae	*Tamias ruficaudus*	Red-tailed chipmunk	3

Soricidae	*Sorex trowbridgii*	Trowbridge's shrew	3
Plethodontidae	*Plethodon larselli*	Larch mountain salamander	4
Alcidae	*Brachyramphus mannoratus*	Marbled murrelet	4
Emberizidae	*Dendroica nigrescens*	Black-throated gray warbler	4
Phasianidae	*Bonasa* umbellus	Ruffed *grouse*	4
Strigidae	*Aegolius acadicus*	Northern saw-whet owl	4
Strigidae	*Strix varia*	Barred owl	4
Troglodytidae	*Troglodytes troglodytes*	Winter wren	4
Tyrannidae	*Empidonax wrightii*	Gray flycatcher	4
Aplodontidae	*Aplodontia rufa*	Mountain beaver	4
Cervidae	*Odocoileus hemionus columbianus*	Black-tailed deer	4
Felidae	*Lynx lynx*	Lynx	4
Muridae	*Lemmiscus curtatus*	Sagebrush vole	4
Muridae	*Peromyscus truei*	Pinyon mouse	4
Sciuridae	*Glaucomys sabrinus*	Northern flying squirrel	4
Sciuridae	*Mannota caligata*	Hoary marmot	4
Sciuridae	*Tamias umbrinus*	Uinta chipmunk	4
Soricidae	*Sorex hoyi*	Pygmy shrew	4
Talpidae	*Neurotrichus gibbsii*	Shrew-mole	4
Iguanidae	*Sceloporus graciosus graciosus*	Sagebrush lizard	4
Apodidae	*Chaetura vauxi*	Vaux's swift	5
Fringillidae	*Carduelis pinus*	Pine siskin	5
Paridae	*Parus gambeli*	Mountain chickadee	5
Phasianidae	*Dendragapus obscurus*	Blue grouse	5
Phasianidae	*Meleagris gallopavo*	Wild turkey	5
Trochilidae	*Calypte anna*	Anna's hummingbird	5
Vireonidae	*Vireo olivaceus*	Red-eyed vireo	5
Cervidae	*Rangifer tarandus caribou*	Woodland caribou	5
Heteromyidae	*Dipodomys californicus*	California kangaroo rat	5
Muridae	*Neotoma fuscipes*	Dusky-footed woodrat	5
Sciuridae	*Tamias amoenus*	Yellow-pine chipmunk	5
Vespertilionidae	*Myotis californicus*	California myotis	5
Vespertilionidae	*Myotis lucifugus*	Little brown myotis	5
Vespertilionidae	*Myotis yumanensis*	Yuma myotis	5
Iguanidae	*Gambelia wislizenii*	Longnose leopard lizard	5
Ambystomatidae	*Ambystoma gracile*	Northwestern salamander	6
Accipitridae	*Buteo lagopus*	Rough-legged hawk	6
Corvidae	*Corvus corax*	Common raven	6
Emberizidae	*Setophaga ruticilla*	American redstart	6
Emberizidae	*Spizella breweri*	Brewer's sparrow	6
Fringillidae	*Carduelis psaltria*	Lesser goldfinch	6
Laniidae	*Lanius excubitor*	Northern shrike	6

Mimidae	*Dumetella carolinensis*	Gray catbird	6
Muscicapidae	*Catharus guttatus*	Hermit thrush	6
Muscicapidae	*Ixoreus naevius*	Varied thrush	6
Phasianidae	*Alectoris chukar*	Chukar	6
Phasianidae	*Callipepla californica*	California quail	6
Phasianidae	*Callipepla gambelii*	Gambel's quail	6
Phasianidae	*Perdix perdix*	Gray partridge	6
Picidae	*Melanerpes lewis*	Lewis' woodpecker	6
Picidae	*Picoides pubescens*	Downy woodpecker	6
Picidae	*Sphyrapicus nuchalis*	Red-naped sapsucker	6
Picidae	*Sphyrapicus thyroideus*	Williamson's sapsucker	6
Sittidae	*Sitta canadensis*	Red-breasted nuthatch	6
Troglodytidae	*Catherpes mexicanus*	Canyon wren	6
Troglodytidae	*Salpinctes obsoletus*	Rock wren	6
Antilocapridae	*Antilocapra americana*	Pronghorn	6
Bovidae	*Ovis canadensis. californiana*	California bighorn sheep	6
Bovidae	*Ovis canadensis canadensis*	Rocky mountain bighorn sheep	6
Equidae	*Equus caballus*	Feral horse	6
Heteromyidae	*Dipodomys' ordii*	Ord's kangaroo rat	6
Heteromyidae	*Perognathus parvus*	Great basin pocket mouse	6
Leporidae	*Sylvilagus floridanus*	Eastern cottontail	6
Leporidae	*Sylvilagus nuttallii*	Mountain cottontail	6
Muridae	Neotoma *lepida*	Desert woodrat	6
Muridae	*Onychomys leucogaster*	Northern grasshopper mouse	6
Muridae	*Peromyscus crinitus*	Canyon mouse	6
Muridae	*Phenacomys intermedius*	Heather vole	6
Sciuridae	*Ammospemophil us leucurus*	White-tailed antelope squirrel	6
Sciuridae	*Spermophilus beecheyi*	California ground squirrel	6
Sciuridae	*Spermophilus townsendii*	Townsend's ground squirrel	6
Sciuridae	*Spermophilus washingtoni*	Washington ground squirrel	6
Soricidae	*Sorex monticolus*	Montane shrew	6
Soricidae	*Sorex prebl ei*	Preble's shrew	6
Colubridae	*Masticophis taeniatus*	Striped whipsnake	6
Colubridae	*Rhinocheilus lecontei*	Longnose snake	6

Iguanidae	*Phrynosoma douglassii*	Short-horned lizard	6
Iguanidae	*Phrynosoma platyrhinos*	Desert horned lizard	6
Iguanidae	*Uta stansburiana*	Side-blotched lizard	6
Scincidae	*Eumeces skiltonianus*	Western skink	6
Teiidae	*Cnemidophorus tigris*	Western whiptail	6
Teiidae	*Cnemidophorus velox*	Plateau striped whiptail	6
Pelobatidae	*Spea intermontana*	Great basin spadefoot	7
Emberizidae	*Piranga ludoviciana*	Western tanager	7
Emberizidae	*Vermivora peregrina*	Tennessee warbler	7
Fringillidae	*Carpodacus cassinii*	Cassin's finch	7
Fringillidae	*Coccothraustes vespertinus*	Evening grosbeak	7
Fringillidae	*Pinicola enucleator*	Pine grosbeak	7
Hirundinidae	*Hirundo pyrrhonota*	Cliff swallow	7
Phasianidae	*Centrocercus urophasianus*	Sage grouse	7
Picidae	*Picoides villosus*	Hairy woodpecker	7
Sittidae	*Sitta carolinensis*	White-breasted nuthatch	7
Strigidae	*Surnia ulula*	Northern hawk owl	7
Tyrannidae	*Contopus borealis*	Olive-sided flycatcher	7
Tyrannidae	*Empidonax hammondii*	Hammond's flycatcher	7
Tyrann'idae	*Sayornis saya*	Say's phoebe	7
Tyrannidae	*Tyrannus verticalis*	Western kingbird	7
Vireonidae	*Vireo gilvus*	Warbling vireo	7
Vireonidae	*Vireo solitarius*	Solitary vireo	7
Cervidae	*Alces alces*	Moose	7
Heteromyidae	*Dipodomys microps*	Chisel-toothed kangaroo rat	7
Heteromyidae	*Microdipodops megacephalus*	Dark kangaroo mouse	7
Leporidae	*Lepus townsendii*	White-tailed jackrabbit	7
Muridae	*Clethrionomys gapperi*	Southern red-backed vole	7
Muridae	*Microtus pennsylvanicus kincaidi*	Potholes meadow vole	7
Sciuridae	*Marmota flaviventris*	Yellow-bellied marmot	7
Sciuridae	*Spermophilus columbianus*	Columbian ground squirrel	7
Talpidae	*Scapanus orarius*	Coast mole	7
Vespertilionidae	*Lasiurus cinereus*	Hoary bat	7
Vespertilionidae	*Myotis volans*	Long-legged myotis	7
Accipitridae	*Accipiter cooperii*	Cooper's hawk	8
Accipitridae	*Accipiter gentilis*	Northern goshawk	8
Accipitridae	*Aquila chrysaetos*	Golden eagle	8
Columbidae	*Columba livia*	Rock dove	8
Emberizidae	*Chondestes grammacus*	Lark sparrow	8

Emberizidae	***Dendroica coronata***	Yellow-rumped warbler	8
Emberizidae	***Seiurus noveboracensis***	Northern waterthrush	8
Laniidae	***Lanius ludovicianus***	Loggerhead shrike	8
Muscicapidae	***Catharus ustulatus***	Swainson's thrush	8
Paridae	*Parus* ***atricapillus***	Black-capped chickadee	8
Tyrannidae	*Empidonax* ***oberholseri***	Dusky flycatcher	8
Tyrannidae	***Myiarchus cinerascens***	Ash-throated flycatcher	8
Bovidae	***Oreamnos americanus***	Mountain goat	8
Geomyidae	***Thomomys*** *mazama*	Western pocket gopher	8
Geomyidae	***Thomomys talpoides*** *douglasi*	Brushprairie pocket gopher	8
Geomyidie	***Thomomys townsendii***	Townsend's pocket gopher	8
Mustelidae	***Mephitis*** mephitis	Striped skunk	8
Sciuridae	***Spermophilus beldingi***	Belding's ground squirrel	8
Sciuridae	***Spermophilus elegans nevadensis***	Wyoming ground squirrel	8
Sciuridae	***Tamias*** *minimus*	Least chipmunk	8
Vespertilionidae	***Antrozous*** *pallidus*	Pallid bat	8
Iguanidae	***Sceloporus occidentalis***	Western fence lizard	8
Bufonidae	***Bufo woodhousii***	Woodhouse's toad	9
Accipitridae	***Buteo jamaicensis***	Red-tailed hawk	9
Emberizidae	***Oporornis tolmiei***	Macgillivray's warbler	9
Emberizidae	***Passerina amoena***	Lazuli bunting	9
Emberizidae	***Pheucticus ludovicianus***	Rose-breasted grosbeak	9
Emberizidae'	***Spizella passerina***	Chipping sparrow	9
Hirundinidae	***Hirundo*** *rustica*	Barn swallow	9
Hirundinidae	***Tachycineta thalassina***	Violet-green swallow	9
Phasinaidae	Oreortyx *pictus*	Mountain quail	9
Tyrannidae	***Contopus sordidulus***	Western wood-pewee	9
Tyrannidae	*Empidonax* traillii	Willow flycatcher	9
Didelphidae	***Didelphis virginiana***	Virginia opossum	9
'Geomyidae	***Thomomys talpoides***	Northern pocket gopher	9
Geomyidae	Thomomys ***talpoides*** *limosus*	White salmon pocket gopher	9
Leporidae	***Lepus americanus***	Snowshoe'hare	9
Muridae	***Reithrodontomys megalotis***	Western harvest mouse	9
Procyonidae	***Procyon*** *lotor*	Common raccoon	9
Sciuridae	***Spermophilus saturatus***	Cascade golden-mantled ground squirrel	9
Vespertilionidae	*Myotis* ***evotis***	Long-eared myotis	9
Vespertilionidae	*Myotis* ***thysanodes***	Fringed myotis	9

Anguidae	***Elgaria multicarinata***	Southern alligator lizard	9
Boidae	***Charina bottae***	Rubber boa	9
Colubridae	***Diadophis punctatus***	Ringneck snake	9
Colubridae	***Pituophis catenifer***	Gopher snake	9
Plethodontidae	***Ensatina eschscholtzii***	Ensatina	10
Accipitridae	***Buteo regalis***	Ferruginous hawk	10
Apodidae	***Cypseloides niger***	Black swift	10
Charadriidae	***Charadrius vociferus***	Killdeer	10
Corvidae	***Corvus brachyrhynchos***	American crow	10
Cuculidae	***Coccyzus americanus***	Yellow-billed cuckoo	10
Emberizidae	***Junco hyemalis***	Dark-eyed junco	10
Emberizidae	***Passerella iliaca***	Fox sparrow	10
Emberizidae	***Vermivora celata***	Orange-crowned warbler	10
Emberizidae	***Zonotrichia leucophrys***	White-crowned sparrow	10
Emberizidae	***Zonotrichia querula***	Harris' sparrow	10
Falconidae	***Falco peregrinus***	Peregrine falcon	10
Hirundinidae	***Stelgidopteryx serripennis***	Northern rough-winged swallow	10
Strigidae	***Otus kennicottii***	Western screech owl	10
Trochilidae	***Archilochus alexandri***	Black-chinned hummingbird	10
Trochilidae	***Selasphorus rufus***	Rufous hummingbird	10
Trochilidae	***Stellula calliope***	Calliope hummingbird	10
Tyrannidae	***Tyrannus tyrannus***	Eastern kingbird	10
Canidae	***Vulpes vulpes***	Red fox	10
Cervidae	***Odocoileus virginianus***	White-tailed deer	10
Muridae	***Microtus montanus***	Montane vole	10
Muridae	***Microtus pennsylvanicus***	Meadow vole	10
Mustelidae	***Gulo gulo***	Wolverine	10
Mustelidae	***Mustela erminea***	Ermine	10
Mustelidae	***Spilogale gracilis***	Western spotted skunk	10
Sciuridae	***Spennophilus lateralis***	Golden-mantled ground squirrel	10
Soricidae	***Sorex vagrans***	Vagrant shrew	10
Vespertilionidae	***Euderma maculatum***	Spotted bat	10
Vespertilionidae	***Myotis ciliolabrum***	Western small-footed myotis	10
Colubridae	***Contia tenuis***	Sharptail snake	10
Colubridae	***Hypsiglena torquata***	Night snake	10
Colubridae	***Lampropeltis zonata***	California mountain kingsnake	10
Ambystomatidae	***Ambystoma macrodactylum***	Long-toed salamander	11
Ambystomatidae	***Ambystoma tigrinum***	Tiger salamander	11
Hylidae	***Pseudacris regilla***	Pacific chorus frog	11

Hylidae	*Pseudacris triseriata*	Western chorus frog	11
Apodidae	*Aeronautes saxatalis*	White-throated swift	11
Caprimulgidae	*Chordeiles minor*	Common nighthawk	11
Cathartidae	*Cathartes aura*	Turkey vulture	11
Columbidae	*Zenaida macroura*	Mourning dove	11
Corvidae	*Pica pica*	Black-billed magpie	11
Emberizidae	*Icteria virens*	Yellow-breasted chat	11
Emberizidae	*Icterus galbula*	Northern oriole	11
Emberizidae	*Molothrus ater*	Brown-headed cowbird	11
Muscicapidae	*Myadestes townsendi*	Townsend's solitaire	11
Muscicapidae	*Sialia currucoides*	Mountain bluebird	11
Muscicapidae	*Sialia mexicana*	Western bluebird	11
Muscicapidae	*Turdus migratorius*	American robin	11
Picidae	*Colaptes auratus*	Northern flicker	11
Strigidae	*Asio otus*	Long-eared owl	11
Strigidae	*Bubo virginianus*	Great horned owl	11
Trochilidae	*Selasphorus platycercus*	Broad-tailed hummingbird	11
Troglodytidae	*Troglodytes aedon*	House wren	11
Canidae	*Canis latrans*	Coyote	11
Canidae	*Canis lupus*	Gray wolf	11
Cervidae	*Cervus elaphus nelsonii*	Rocky mountain elk	11
Cervidae	*Odocoileus hemionus*	Mule deer	11
Erethizontidae	*Erethizon dorsatum*	Common porcupine	11
Felidae	*Felis concolor*	Mountain lion	11
Felidae	*Lynx rufus*	Bobcat	11
Muridae	*Microtus longicaudus*	Long-tailed vole	11
Muridae	*Neotoma cinerea*	Bushy-tailed woodrat	11
Muridae	*Peromyscus keenii*	Columbian mouse	11
Muridae	*Peromyscus maniculatus*	Deer mouse	11
Mustelidae	*Mustela frenata*	Long-tailed weasel	11
Mustelidae	*Taxidea taxus*	American badger	11
Soricidae	*Sorex cinereus*	Masked shrew	11
Ursidae	*Ursus americanus*	Black bear	11
Ursidae	*Ursus arctos*	Grizzly bear	11
Vespertilionidae	*Eptesicus fuscus*	Big brown bat	11
Vespertilionidae	*Lasionycteris noctivagans*	Silver-haired bat	11
Anguidae	*Elgaria coerulea*	Northern alligator lizard	11
Colubridae	*Coluber constrictor*	Racer	11
Colubridae	*Thamnophis elegans*	Western terrestrial garter snake	11
Colubridae	*Thamnophis sirtalis*	Common garter snake	11
Viperidae	*Crotalus viridis*	Western rattlesnake	11

• – Versatility rating denotes the number of other structural stages used by the species (11 maximum).

Table NATHAS. List of possible natural areas within Columbia River Basin.

Designation	Objectives of allocation	Administrative level of allocation	Standardization across ownership	Range in sir
AREAS OF CRITICAL ENVI RONMENTAL CONCERN	Protect and prevent irreparable damaqe to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes.	ELM administrative designation	Potential ACEC's considered in BLM planning process; intent and management varies significantly	Small to large.
BIOSPHERE RESERVES	To conserve for present and future use the diversity and integrity of biotic communities of plants and animals within natural ecosystems, and to safeguard the genetic diversity of species on which their continuing evolution depends.	UNESCO, United Nations designates areas, but management is up to landowner or agency.	Management varies depending on ownership.	Generally very large
CONGRESSIONALLY DESIGNATED "SPECIAL" AREAS	Varies with specific legislation as identified below.	Act of Congress.	None.	Various.
CDA's in R-1	Rattlesnake NRA: Promote watershed, recreational, wildlife, and educational values.			
CDA's in R-4	Sawtooth NRA: 1. Preserve and protect the natural, scenic, historic, pastoral, and fish and wildlife values. 2. Enhance recreation values including the preservation of sites associated with and typifying the economic and social history of the A West. 3. Protect and conserve the salmon and other flsherles.			

Table NATHAS. List of possible natural areas within Columbia River Basin.

Designation	objectives of allocation	Administrative level of allocation	Standardization across ownership	Range in sir
CDA's in R-6	PART OF CRGNSA WITHIN ASSESSMENT AREA BOUNDARY Columbia River Gorge NSA: 1. Protect and provide for the enhancement of the scenic, cultural, recreational, and natural re of the Columbla River Gorge. 2. Protect and support the economy of the Columbia River Gorge area by encouraging growth to existing urban areas and allowing future economic development in a manner that is consistent with (1). Hells Canyon Natural Recreation Area: 1. Preserve the natural beauty and historical and archaeological values. 2. Enhanc recreational and ecological values and public enjoyment of the area. Newberry NVM: 1 . Preserve and protect its remarkable geologic landforms. 2. Provide for conservation, protection, Interpretation, and enhancement of its ecological, botanical, scientific, scenic, recreational, cultural, and fish and wildl resources. SMALL PART OF OCRA IN ASSESSMENT AREA BOUNDARY Oregon Cascades Recreation Area: 1. Protect, conserve, and manage area in an undeveloped condition. 2. Provide a range o recreation opportunities from primitive to full service developed campgrounds. 3. Provide access for use by the public. 4 the extent practicable, maintain the natural and scenic character of the area.			
NATIONAL NATURAL LANDMARKS	Identify and encourage the preservation of the full range of geological and ecological features that are determlned to represent nationally slgnlflcant examples of the Nation's natural heritage.	Deslgnatlon is not a land withdrawal, does not change the ownership of a alte, and does not dictate activity. Federal agencies should consider the unique properties of these nationally slgnlflcant areas in completing NEPA.	Depends on ownership. Areas can be on private as well as public lands. Management varles.	12 - 170,000 ac
NATIONAL PARKS AND MONUMENTS	Purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.	Act of Congress.	Each area within the system is administered in accordance with the provisions of any statute made specifically . applicable to that area. Park and Monument managers provide speci flc purposes and management direction by readlnq enablIng legislation or proclamation and determine general management direction, not inconsistent with the enabling legislation, from the organic act.	9 8 - 2,219,790 ac

Table NATHAS. List of possible natural areas within Columbia River Basin.

Designation	Objectives of allocation	Administrative level of allocation	Standardization across ownership	Range in siz
NATIONAL WILDLIFE REFUGE	To provide, preserve, restore, and manage a network of lands and waters sufficient in slze, diversity, and location to meet society's needs for areas where the widest possible spectrum of benefits associated with wildlife and wildlands is enhanced and made available.	Designated by Department of Interlor, U.S. Fish and Wildlife Service.	Management varies depending on individual areas and wildlife needs.	1,837-536,955
OUTSTANDING NATURAL AREAS	Preserve areas of unusual natural characteristics.	BLM administrative designation.		Small to large
RESEARCH NATURAL AREA	1. Preserve examples of all significant terrestrial and aquatic ecosystems. 2. Research and education areas. 3. Preserve gene pools for TES species. 4. Serve as benchmarks against which the influences of human management activity can 'be compared.	USFS Regional Forester and Station Director BLM State Director. FWS Regional Director. NPS Regional Director.	All Federal agencies generally use similar criteria for establishment, though management direction not always the same.	40-33,350 acres.
ROADLESS AREAS (WILDERNESS STUDY)	Inventory for potential wilderness based on size (5,000 acres or self-contalned ecosystem) wlth addltional criteria for naturalness.	Regional Forester - completed through existing Forest Plans. BLM State Director - areas currently being evaluated in Resource Management Plans. NPS - not currently evaluating roadless areas.	Inventory directed by Wilderness Act, and subsequent Wilderness legislation. Agencies apply somewhat similar criteria for inventory and subsequent study.	Sized as described for Wilderness.

Table NATHAS. List of possible natural areas within Columbia River Basin.

Designation	objectives of allocation	Administrative level of allocation	Standardization across ownership	Range in siz
SPECIAL INTEREST AREAS	1. Protect and, where appropriate, foster public use and enjoyment of areas with scenic, historical, geological, botanical, tooloqlcal, paleontoloqlcal, or other' special characterlstlcs. 2. Classify areas that possess unusual recreation and scientific values for public study, use, or enjoyment.	Forest Service administrative designation under authority in 36 CFR 294.1 and 294.1(b). Approval varies by authority and size.	Potential SIA's considered in Forest Service planning process; intent and management varies significantly.	Small to very large.
WILD AND SCENIC RIVERS	1. Preserve free-flowing condition and protect water quality. 2. Protect and enhance the outstandingly remarkable values. 3. Scientific value for study of free-flow processes. 4. Gene reservoirs and refugia for river-dependent species. 5. Some systems provide benchmarks where human management can be compared.	1. Act of Congress; or, 2. for state protected river, by petltlon of Governor to Secretary of Interior (becomes part of Federal W&SR's System to be administered by State).	Federal statute establishes framework, though agency interpretation and resultant management varies.	No length required. Oft a portion of river syste designated. Corridor wi flexible but limited to acres per river mile.
WILD AND SCENIC CONGRESSIONALLY-AUTHORIZED STUDY RIVERS	Inventory for potential W&SR's based on ellqibllity (free-flow, one or more outstandingly remarkable value). Protected, by statute from water resources projects and, for "wild" rivers, mining/mineral leasing. Agency direction is to protect and, as practicable, enhance outstanding values. Inventorled or recommended classification to be maintained.	Act of Congress.	Agencies apply somewhat similar criteria for eligibility and'subsequent study.	As for designated rivers corridor 1/4 mile from o high water mark.

Table NATHAS. List of possible natural areas within Columbia River Basin.

Designation	Objectives of allocation	Administrative level of allocation	Standardization across ownership	Range in sir
WILD AND SCENIC STUDY RIVERS (IDENTIFIED VIA AGENCY PLANNING PROCESSES)	Inventory for potential W&SR's based on ellglblllty (free-flow, one or more outstandingly remarkable value). Agency direction to protect free-flow within authorities and protect and, as practicable enhance outstanding values. Inventorled or recommended classification to be maintained.	Each Federal agency is directed by Section 5(d)(1) of W&SR's Act to consider potential additions in respective planning processes.	Agencies apply somewhat similar criteria for eligibility and subsequent study.	As for designated rivers corridor 1/4 mile from o high water mark.
WILDERNESS AREAS	1. Preserve and protect areas in their natural condltlon. 2. Scientific value as natural basellnes, and for study of natural processes. 3. Gene reservoirs and refugla for certain species. 4. Benchmark to areas where impact of human management can be compared. 5. Provide opportunities for solitude or primitive, unconfined recreation.	Act of Congress.	Federal statute establishes framework, though agency interpretation and resultant management varies.	Statute defines at least acres; however, self-con smaller areas, e.g., Ore Islands at less than 7 a have been designated.
WILDERNESS STUDY AREAS	Montana (P.L. 95-150) - Maintain presently existing wilderness character and potential for inclusion In Wilderness Preservation System. RUTH, I DO NEED TO KNOW WHICH STATE IN R-4 AND THE PROTECTION PROVISION PROVIDED IN ENABLING LEGISLATION--THANKS!	Act of Congress.	Specific areas identified through Wilderness leglslatlon.	Sired as described for Wilderness.

Table NATHAS. List of possible natural areas within Columbia River Basin.

Designation	objectives of allocation	Administrative level of allocation	Standardization across ownership	Range in siz
NATURAL HERITAGE CONSERVATION AREA, OR	1. To protect examples of terrestrial and aquatic ecosystems, and important geologic features; 2. to serve as gene pool reserves: 3. to serve as benchmarks against which the influences of human activity may be compared; 4. and to provide outdoor laboratories for research and education.	State Land Board, State Parks and Recreation Department, Department of Forestry, Department of Fish and Wildlife, Military Department, and Conservation Organlzatlons.	Management direction should be consistent across agencies.	600 ac
REGISTERED STATE NATURAL AREAS, OR	To acknowledge and list examples of relatively undisturbed terrestrial and aquatic ecosystems, rare plant and animal species, and unique geologic features.	Division of State Lands, Parks and Recreation Department, Department of Forestry, Department of Transportation, Department of Fish and Wildlife, local governments, and private landowners.	Direction not consistent across agencies. Private landowners not legally bound by this designation.	50 - 3,000 ac
BIOLOGICAL STUDY AREAS, WA	1. To protect examples of undisturbed terrestrial and aquatic ecosystems, rare plant and animal species, and unique geologic features; 2. to serve as gene pools reserves; 3. to serve as baselines against which the Influences of human activities in simlilar, disturbed ecosystems may be compared; and 4. to provide outdoor laboratories for sclentlflc research and education.	Washington State University and University of Washlngton. Potentially secure designation.	Not very many areas, managed in similar fashion.	7 - 40 ac

Table NATHAS. List of possible natural areas within Columbia River Basin.

#Designation	Objectives of allocation	Administrative level of allocation	Standardization across ownership	Range in sir
HERITAGE AREA, WA	To preserve unique or geological, paleontological, archaeological, historical, scientific, and cultural features of the state which transcend local lnterest and are of statewide or national significance (WAC 3552-16-020[3]).	Washington State Parks and Recreation Commission.	Some variation in use and management.	No areas in CRB at this
NATURAL AREA, WA	To conserve a natural environment in a nearly undeveloped state for passive low denslty outdoor recreation activities.	Washington State Parks and Recreation Commission.	Some variation in use and management.	No areas in CRB at this
NATURAL FOREST AREA, WA	Designation of certain forest sites which are natural ecosystems for the preservation and interpretation of natural forest processed pursuant to RCW 43.51.045. These areas may contain old-growth forest communities, mature forest communltles, or unusual forest communities (WAC 352-16-020[8]).	Washington State Parks and Recreation Commission.	Some variation in use and management.	No areas in CRB at this
NATURAL AREA PRESERVE, WA	1. To protect examples of undisturbed terrestrial and aquatic ecosystems, rare plant and animal species, and unique geologic features; 2. to serve as gene pool reserves; 3. to serve as baselines against which the influences of human activities in similar, disturbed ecosystems may be compared; and 4. to provide outdoor laboratories for scientific research and education (RCW) 79.70.010.	Washington Department of Natural Resources, Washington State Parks and Recreation Commlsslon, Washington Department of Fish and Wildlife.	Management generally consistent across administering agencies.	35 - 3,000 ac

Table NATHAS2. Total area managed by Federal agencies in four western states, and area and percent in natural area designations. (Source: USGAO 1995)

STATE	ACRES MANAGED (millions of hectares)	ACRES IN NATURAL AREAS (millions of hectares)	PERCENT IN NATURAL AREAS
Oregon	12.99	2.87	22
Washington	4.69	1.94	41
Idaho	13.13	3.91	30
Montana	10.82	3.00	28

Table 1(TAB. RANGE1, FILE TABRNGRE). Fire and fire management outcome for different vegetation types within the Intermountain West and associated areas. Prescribed fires are indicated by Rx in the "Fire?" column.

Location	Habitat	Dominant Species	Fire?	Management Outcome	Citation
Sheeprock Mts., UT	Pinyon - Juniper	*Pinus monophylla* *Juniperus osteosperma*	Yes	Succession in pinyon and juniper woodlands followed a general scheme of annuals to perennial grasses (5 years), to grasses and shrubs (35 years), to shrubs and juniper (70 years), and juniper - pinyon (+100 years).	Barney and Frischknecht 1974
Needle Range, UT	Pinyon - Juniper	*Pinus monophylla* *Juniperus osteosperma*	Yes	Juniper established at a higher rate following fire than did pinyon. By 60 years post-fire, pinyon establishment was greater than juniper.	Tausch and West 1988
White River Mts., NV	Pinyon - Juniper	*Pinus monophylla* *Juniperus osteosperma*	Yes, Rx	Prescribed fire impacted the pinyon- juniper woodlands differently, depending on season of burn, pre-burn community composition.	Everett and Ward 1984
Great Basin, ID, NV, UT	Pinyon - Juniper	*Pinus monophylla* *Juniperus osteosperma*	No	Within pinyon-juniper woodlands, pinyon density was found to be increasing faster than juniper density. It was suggested that livestock grazing, tree utilization, and fire suppression may have interacted to influence the differences in density.	Tausch et al. 1981
Upper Snake River Plains, ID	Sagebrush - grass	*Artemisia tridentata* *Agropyron dasystachyum* *Stipa comata* *Poa* spp. *Carex* spp.	Yes, Rx	After 15 years, shrub cover was greatly reduced, while on the unburned areas had increased. Grass production was as much as or greater than on unburned areas. Forb production was also increased.	Blaisdell 1953
				30 years following the prescribed burns, sagebrush had regained a dominant position in the communities, but had not reached the unburned level. Grass and forb yield declined as sagebrush increased.	Harniss and Murray 1973

LOCATION	HABITAT	DOMINANT SPECIES	FIRE?	MANAGEMENT OUTCOME	CITATION
Northwest Yellowstone Nat. Park, WY	Sagebrush - grass	*Artemisia tridentata* *Festuca idahoensis*	No	Lodgepole pine invading sagebrush communities. Invasion is thought lo be the result of climatic change.	Patten 1963 Patten 1969
Jackson Hole Area, northwestern WY	Sagebrush - grass	*Artemisia tridentata* *Artemesia arbuscula* *Purshia tridentata* *Chrysothamnus* spp. Various grass species	No	Due to active fire suppression in the Jackson Hole area since the 1890'9, lodgepole pine has invaded sagebrush communities, and sagebrush and other shrubs have increased. It is believed that recurrent fire kept shrub levels lower, and prevented conifer invasion.	Loope and Gruell 1973
Owyhee Mts. ID	Sagebrush grass	*Artemisia tridentata* *Artemisia arbuscula* *Agropyron spicatum* *Festuca idahoensis*	No	Active fire suppression is believed to have allowed the invasion of juniper into the *Artemisa* dominated communities. Ancillary to fire suppression is grazing by domestic livestock and climatic changes.	Burkhardt and Tisdale 1976
Idaho National Engineering Laboratory, southeastern ID	Sagebrush grass	*Artemisia tridentata* *Chrysothamnus viscidiflorus* *Leptodactylon pungens* *Gutierrezia sarothrae* *Sitanion hystrix* *Agropyron dasytachyum* *Oryzopsis hymenoides* *Stipa comata*	No	Over a disturbance-free period of 25 years, shrub and grass species increased in cover, but began a decline after 20 years.	Anderson and Holte 1981
Galena Gulch, MT	Sagebrush - grass	*Artemisia tridentata* *Festuca idahoensis* Festuca *scabrella*	No	The historic fire frequency favored the species of the shrub-grassland. With fire suppression, invasion of *Pseudotsuga menziesii* and *Pinus contorta* into the shrub-grasslands has occurred.	At-no and Gruell 1986

LOCATION	HABITAT	DOMINANT SPECIES	FIRE?	MANAGEMENT OUTCOME	CITATION
Gallatin Nat. For. MT	Sagebrush - gross	*Artemisia tridentata* *Artemisia cana* *Danthonia unispicata* *Bromus marginatus*	Yes, Rx	A spring prescribed bum resulted in decreases in sagebrush and smooth brome (*Bromus marginatus*); an increase occurred for danthonia (*Danthonia unispicata*).	Nimir and Payne 1978
Southwestern MT	Sagebrush - grass - forest ccotone	*Artemisia tridentata* *Agropyron spicatum* *Festuca idahoensis*	No	Suppression of fires is believed to be responsible for the encroachment of conifers into the sagebrush grasslands, and also the increase in density of sagebrush in these areas.	Amo and Gruell 1983
East-central NV	Sagebrush - grass	*Artemisia nova*	No	invasion by pinyon pine and juniper into black sagebrush communities has been occurring since 1869. Overgrazing, fire. suppression, and change in climate have been proposed as factors in the invasion process.	Blackburn and Tueller 1970.
Northwestern NV	Sagebrush - grass	*Artemisia tridentata* *Stipa thurberiana* *Bromus tectorum*	Yes	The first year following the wildfires, both perennial and annual species were reduced. By the second year post-fire, the areas became dominated by cheatgrass, which prevented seedling establishment of native species.	Young and Evans 1978
Southern British Columbia	Sagebrush - grass	*Artemisia tridentata* *Agropyron spicatum*	No	It is believed that recurrent fire maintained sagebrush at low densities prior to settlement by immigrants. With fire suppression, sagebrush densities have increased.	Cawker 1983
Hanford Nuclear Res., WA	Bitterbrush - cheatgrass	*Purshia tridentata* *Bromus tectorum*	Yes	The fit year following wildfire, cheatgrass production was very low. By the fifth year post-fire, production was similar on burned and unburned sites. Bitterbrush was removed from the site, and there was no evidence of re-establishment.	Rickard and Sauer 1982

LOCATION	HABITAT	DOMINANTSPECIES	FIRE?	MANAGEMENT OUTCOME	CITATION
Devils Tower Nat. Monument, WY	Savanna-prairie	Shrub and grass species	*No*	The fire history of this area indicates an historical fire return period (FRP) of 14 years. Currently, the area has a much longer FRP, which has resulted in the invasion of the savanna and prairie communities by ponderosa pine.	Fisher et a!. .1987
Glacier Nnt. Park, MT	Grassland	*Agropyron spicatum* ***Festuca idahoensis*** ***Festuca scabrella*** *Danthonia intermedia*	No	These grasslands are thought to have developed and be maintained through the interactions of climate, soils, and fire. Fire suppression in the park, since 19 10, has resulted in the invasion of lodgepole piné into the grasslands.	Koterba and Habeck 197 1
Southeastern WA	Grassland	*Agropyron spicatum* *Poa secunda*	Yes	Fire resulted in a change in balance between the two dominant grass species, with ***Poa*** becoming ***the*** dominant. Preburn levels were attained after 12 years.	Daubenmire 1975
		Chrysothamnus nauseosus *Bromus tectorum*		Cheatgrass levels attained preburn level by the second year. Rabbitbrush was completely eliminated, in part due to heavy insect herbivory prior to the fire.	
Mt. Sentinel, MT	Grassland	***Festuca scabrella*** ***Festuca idahoensis*** ***Agropytvn spicatum***	Yes	Active fire suppression allowed the encroachment of ponderosa pine and Douglas fir into the more mesic areas of the grassland Three years following a wildfire, cover of most species was similar in both burned and unburned areas, fescue was slightly lower on burned areas.	Antos et a!. 1983

LOCATION	HABITAT	DOMINANT SPECIES	FIRE?	MANAGEMENT OUTCOME	CITATION
Cascades of OR and WA	Subalpine meadow	*Phyllodoce empetriformis / Vaccinium deliciosum*	*No*	High conifer invasion	Franklin et al. 197 1
		Valeriana sitchensis		Low conifer invasion	
		Festuca viridula		Low conifer invasion	
		Potentilla flabellifolia		High conifer invasion	
				Change in climate, resulting in a longer snow-free period, is suggested as the driving force of the invasions.	
Calispell Peak, northeast WA	Subalpine meadow	*Artemisia tridentata* *Agropyron spicatum* *Abies lasiocarpa*	*No*	Trees occur in swales with deeper soils and low stone content Sagebrush/grass occurs on mounds with deeper soils and low stone content Grasses occur in intermound areas with shallow, stoney soils.	Roche and Busacca 1987
Cascades, central and southern OR	Montane meadow	*Rubus parviflorus / Pteridum aquilinum* *Bromus carinatus / Rudbeckia occidentalis*	*No*	Invasion of meadows by various conifer species depending on the surrounding forest. Fires were believed to be the dominant force in maintaining the meadows.	Vale 1981
Southern. Sierra Nevada, CA	Subalpine meadow	*Carex scopulorum* *Carex rostrata* *Deschampsia caespitosa*	Yes	First year post-fire, area dominated by forbs, some lodgepole pine invading the meadow were killed; after 4 years, returning towards pre-fire community, tree encroachment slowed	DeBenedetti and Parsons 1979 Parsons 1981 DeBenedetti and Parsons 1984

LOCATION	HABITAT	DOMINANT SPECIES	FIRE?	MANAGEMENT OUTCOME	CITATION
, Lemhi Mts., ID	Subalpine meadows	*Festuca ovina* *Festuca idahoensis* *Poa secunda* *Artemisia* spp.	*No*	Most conifer invasion occurred between 1895-l 9 15 and again between 1920- 1940. Several factors are suggested as driving the invasions: climate change, fire history, and grazing pressures.	Butler 1986
Yellowstone Nat. Park, WY	Subalpine mendows: dry and mesic	Dry: *Artemisia tridentata* *Artemisia cana* *Carex* spp. *Muhlenbergia* spp. *Achillea millefolium* Mesic: *Carex* spp. *Antennaria carymbosa* *Potentilla gracilis* *Deschampsia caespitosa* *Phleum alpinum*	No	Conifer encroachment is suggested to be due to climatic' variability in the dry meadows, and due to episodic seed production and microhabitat changes in mesic meadows.	Jakubos and Romme 1993

Table TABRNGSO. Soil Susceptibility to Disturbance Stresses (hectares)

ERU[1]	K Factor (mod.)	WEG (mod.)	Salinity (mod.)	SAR (severe)	SAR (mod.)	Shrink-Swell (mod.)
1.	136915	496252	3352			
2.	28226	1826				1826
3.		373926	99877			83055
4.	139255	2710595	496014			614131
5.	3141189	3660856	514628			480221
6.	245564	2306457	77262			596935
7.	370109	3071161	29448			
8.	90730	1543431				
9.	159398	1336702		1711	1711	3066
10.	1045316	5197317	1147419	5544	15863	1145886
11.	949074	963937	1190722		20942	73315
12.	277540	995584	32024			1632
13.	96051	2132411	372039			47225

[1]ERU's (Ecological Reporting Units): 1. Northern Cascades, 2. Southern Cascades, 3. Upper Klamath, 4. Northern Great Basin, 5. Columbia Plateau, 6. Blue Mountains, 7. Northern Glaciated Mountains. 8. Lower Clark Fork, 9. Upper Clark Fork, 10. Owyhee Uplands, 11. Upper Snake, 12. Snake Headwaters, 13. Central Idaho Mountains

To: Cindy Dean, ICBEMP Office, Walla Walla WA

cc:

From: brute marcot

Date: April 11, 1996

Re: Tribal Vertebrates of Interest

memo

Cindy,

Would you kindly add this table to the "on file" folder material for the Terrestrial Ecology Staff, SIT (the material I had entitled: "Information On File as Cited in the Terrestrial Ecology Assessment Chapter, Science Integration Team Report, Interior Columbia Basin Ecosystem Management Project").

Thanks.

I've sent a copy of this new table to the EIS teams.

- b.

from the desk of...

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Table TRIBVERT. The 7 1 vertebrate species considered by the Science Integration Team as important to American Indian tribes in the assessment area. Class: R = reptile, B = bird, M = mammal (no amphibians were included in this list).

Class	Family	Scientific name	Common name
B	ACCIPITRIDAE	AQUILA CHRYSAETOS	GOLDEN EAGLE
B	ACCIPITRIDAE	BUTEO JAMAICENSIS	RED-TAILED HAWK
B	ACCIPITRIDAE	BUTEO REGALIS	FERRUGINOUS HAWK
B	ACCIPITRIDAE	HALIAEETUS LEUCOCEPHALUS	BALD EAGLE
B	ACCIPITRIDAE	PANDION HALIAETUS	OSPREY
B	ANATIDAE	BRANTA CANADENSIS	CANADA GOOSE
B	ANATIDAE	CYGNUS BUCCINATOR	TRUMPETER SWAN
B	ANATIDAE	CYGNUS COLUMBIANUS	TUNDRA SWAN
B	ANATIDAE	MERGUS MERGANSER	COMMON MERGANSER
B	COLUMBIDAE	ZENAIDA MACROURA	MOURNING DOVE
B	CORVIDAE	CORVUS CORAX	COMMON RAVEN
B	EMBERIZIDAE	ICTERUS GALBULA	NORTHERN ORIOLE
B	EMBERIZIDAE	ICTERUS PARISORUM	SCOTT'S ORIOLE
B	EMBERIZIDAE	STURNELLA NEGLECTA	WESTERN MEADOWLARK
B	FALCONIDAE	FALCO MEXICANUS	PRAIRIE FALCON
B	FALCONIDAE	FALCO SPARVERIUS	AMERICAN KESTREL
B	HIRUNDINIDAE	HIRUNDO PYRRHONOTA	CLIFF SWALLOW
B	HIRUNDINIDAE	HIRUNDO RUSTICA	BARN SWALLOW
B	HIRUNDINIDAE	PROGNE. SUBIS	PURPLE MARTIN
B	HIRUNDINIDAE	RIPARIA RIPARIA	BANK SWALLOW
B	HIRUNDINIDAE	STELGIDOPTERYX SERRIPENNIS	NORTHERN ROUGH-WINGED SWALLOW
B	HIRUNDINIDAE	TACHYCINETA BICOLOR	TREE SWALLOW
B	HIRUNDINIDAE	TACHYCINETA THALASSINA	VIOLET-GREEN SWALLOW

Class	Family	Scientific name	Common name
B	MIMIDAE	MIMUS POLYGLOTTOS	NORTHERN MOCKINGBIRD
B	MUSCICAF'IDAE	TURDUS MIGRATORIUS	AMERICAN ROBIN
B	PHASIANIDAE	BONASA UMBELLUS	RUFFED GROUSE
B	PHASIANIDAE	CENTROCERCUS UROPHASIANUS	SAGE GROUSE
B	PHASIANIDAE	DENDRAGAPUS CANADENSIS	SPRUCE GROUSE
B	PHASIANIDAE	DENDRAGAPUS OBSCURUS	BLUE GROUSE
B	PHASIANIDAE	TYMPANUCHUS PHASLANELLUS COLUMBIANUS	COLUMBIAN SHARP-TAILED GROUSE
B	PICIDAE	COLAPTES AURATUS	NORTHERN FLICKER
B	RALLIDAE	FULICA AMERICANA	AMERICAN COOT
B	STRIGIDAE	OTUS KENNICOTTII	WESTERN SCREECH OWL
B	TROGLODYTIDAE	CATHERPES MEXICANUS	CANYON WREN
M	ANTILOCAPRIDAE	ANTILOCAPRA AMERICANA	PRONGHORN
M	BOVIDAE	BOS BISON	AMERICAN BISON
M	BOVIDAE	OREAMNOSAMERICANUS	MOUNTAIN GOAT
M	BOVIDAE	OVIS CANADENSIS CALIFORNIANA	CALIFORNIA BIGHORN SHEEP
M	BOVIDAE	OVIS CANADENSIS CANADENSIS	ROCKY MOUNTAIN BIGHORN SHEEP
M	CASTORIDAE	CASTOR CANADENSIS	BEAVER
M	CERVIDAE	ALCES ALCES	MOOSE
M	CERVIDAE	CERVUS ELAPHUS NELSONII	ROCKY MOUNTAIN ELK
M	CERVIDAE	ODOCOILEUS HEMIONUS	MULE DEER
M	CERVIDAE	ODOCOILEUS HEMIONUS COLUMBIANUS	BLACK-TAILED DEER

Class	Family	Scientific name	Common name
M	CERVIDAE	ODOCOILEUS VIRGINIANUS	WHITE-TAILED DEER
M	FELIDAE	FELIS CONCOLOR	MOUNTAIN LION
M	FELIDAE	LYNX RUFUS	BOBCAT
M	LEPORIDAE	BRACI-MAGUS IDAHOENSIS	PYGMY RABBIT
M	LEPORIDAE	LEPUS AMERICANUS	SNOWSHOE HARE
M	LEPORIDAE	LEPUS CALIFORNICUS	BLACK-TAILED JACKRABBIT
M	LEPORIDAE	LEPUS TOWNSEND11	WHITE-TAILED JACKRABBIT
M	LEPORIDAE	SYLVILAGUS NUTTALLII	MOUNTAIN COTTONTAIL
M	MURIDAE	NEOTOMA LEPIDA	DESERT WOODRAT
M	MURIDAE	ONDATRA ZIBETHICUS	COMMON MUSKRAT
M	MUSTELIDAE	LUTRA CANADENSIS	NORTHERN RIVER OTTER
M	MUSTELIDAE	TAXIDEA TAXUS	AMERICAN BADGER
M	OCHOTONIDAE	OCHOTONA PRINCEPS	AMERICAN PIKA
M	SCIURIDAE	MARMOTA FLAVIVENTRIS	YELLOW-BELLIED MARMOT
M	SCIURIDAE	SPERMOPHILUS LATERALIS	GOLDEN-MANTLED GROUND SQUIRREL
M	SCIURIDAE	SPERMOPHILUS TOWNSEND11	TOWNSEND'S GROUND SQUIRREL
M	SCIURIDAE	TAMIAS AMOENUS	YELLOW-PINE CHIPMUNK
M	SCIURIDAE	TAMIAS DORSALIS	CLIFF CHIPMUNK
M	SCIURIDAE	TAMIAS MINIMUS	LEAST CHIPMUNK
M	SCIURIDAE	TAMIAS RUFICAUDUS	RED-TAILED CHIPMUNK
M	SCIURIDAE	TAMIAS UMBRINUS	UINTA CHIPMUNK
M	SCIURIDAE	TAMIASCIURUS DOUGLAS11	DOUGLAS' SQUIRREL

Class	Family	Scientific name	Common name
M	SCIURIDAE	TAMIASCIURUS HUDSONICUS	RED SQUIRREL
M	URSIDAE	URSUS AMERICANUS	BLACK BEAR
M	URSIDAE	URSUS ARCTOS	GRIZZLY BEAR
R	IGUANIDAE	PHRYNOSOMA DOUGLASSII	SHORT-HORNED LIZARD
R	VIPERIDAE	CROTALUS VIRIDIS	WESTERN RATTLESNAKE

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