

November 30, 1995

SPECIES ENVIRONMENT RELATIONS MODEL - SER MODEL ver. 1.0
(Release to EIS teams only)

The SER Model is a series of relational databases that describe basic ecology and species-environment relations of species or groups of rare fungi, lichens, bryophytes, and vascular plants; selected invertebrates, and nearly all vertebrates in the Interior Columbia River Basin. The information within these databases was derived from consultation with expert panels and contract reports from leading species experts. A more complete description of the methods used to capture these data is given in the Terrestrial Ecology Assessment of the Interior Columbia River Basin (Marcot and others, in prep.).

In general, SER information includes vegetation cover type and structural stage habitat relationships, key environmental correlates (KEC), and key ecological functions (KEF) for each individual species or species group. Vegetation habitat relationships describe the primary forest (SAF types) and range (SRM types) cover types and structural stages used by the species or group. Key environmental correlates are other (hypothesized or known) attributes of a species' environment or habitat that most affect realized fitness of individuals within the populations. KECs can include physical habitat factors such as vegetation conditions and specific substrates or resources, biological factors such as presence of obligate symbionts or pollinators, or other environmental factors such as air quality or disturbance regimes (e.g. fire frequency). Key ecological functions describe the species' ecological relationships with other species or with the environment that contribute to overall ecosystem diversity, productivity, or sustainability. KEF and KEC information was codified in a hierarchical classification, and each species was assigned the appropriate codes in the SER data base for functions and correlates.

Three data dictionaries are attached that describe the associated fields in all of the databases (one dictionary each for plants, invertebrates, and vertebrates). Data in each of the databases is related by record number (RECNO), and in some cases, species code (SPPCODE).

Additional information for species includes level of endemism; federal, state and agency status; breeding status, and other information on ecological status. These databases are QSPEC.db and CRBSTATS.db. Data dictionaries for these databases are attached. Data in these databases are related by SPPCODE.

Users of this model should be aware that due to the lack of knowledge of many species ecology, as well as time and financial constraints of the Columbia River Basin Assessment, there are limitations of this model. The scale at which these data were collected was at a broad Basin-wide scale, and many site specific habitat relations, if known, are not well documented in this model. At the same time, knowledge of species ecology at the broad scale (i.e. fragmentation, response to disturbance mechanisms) is not well known either. Factors such as species habitat and biology on a site specific basis should always be considered in conjunction with this model.

Further caution should be taken by users of this ver. 1.0 release of the SER vegetation cover type database. Cover type and structural stage relationships for some species were revised by panels during the recent evaluation of the EIS alternatives, but these revisions have not been entered in this ver. 1.0 release of the database. The revised version (v. 1.01) will be available soon, no later than 1/31/96. KEC, KEF, and other information was not revised during the EIS evaluations and is complete in this ver. 1.0 release.

THE SPECIES-ENVIRONMENT RELATIONS (SER) DATABASE: AN OVERVIEW AND SOME CAUTIONS AND CAVEATS IN ITS USE

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This document provides some guidance and cautions in interpreting the SER database information. I provide an overview of the SER database contents; some cautions and caveats on its use; some information on the need for testing the SER database; an overview of additional databases and maps developed in conjunction with the SER database; and areas of potential future development of the SER and ancillary databases.

In this document, "assessment" refers to the Ecological Assessment conducted by the Science Integration Team, Interior Columbia Basin Ecosystem Management Project.

OVERVIEW OF THE SER DATABASE

The Species-Environment Relations (SER) database was developed for the Interior Columbia Basin Ecosystem Management Project with the objective of providing the first compilation of such information for this specific assessment and planning area. As with any database or model, the user should understand its genesis and shortcomings and adhere to those when applying the tool.

The SER database, developed in Paradox 4.5 for DOS, includes information on the following individual species and species groups:

Individual species of plants and allies (fungi, lichens, and bryophytes): 588 taxa (species and in some cases subspecies), with focus on the 143 C1 and C2 USFWS Candidate species, but also including a total of 394 fungi, 2 nonvascular plant, and 192 vascular plant species

Groups of species of plants and allies: 82 species groups, including 11 bryophyte groups, 39 lichen groups, and 32 vascular plant groups

Invertebrates: 206 individual species or species taxonomic groups, as examples of ecological functional groups; does not include mollusks¹

Vertebrates: all 468 species that regularly occur in the interior Columbia River Basin assessment area (excluding casual and accidental species), including 26 amphibians, 27 reptiles, 283 birds, and 132 mammals

¹Mollusk information is available in separate contract reports.

The SER information on plant and plant ally, invertebrate, and vertebrate species includes:

- **species taxonomy** including class, common name, scientific name, and scientific name acronym code
- **geographic extent** within the CRB
- degree of **endemism** and **percent of range within the CRB**
- panelists' median level of **confidence**
- **general comments** on species ecology and status
- **dispersal** mode and conditions required for successful dispersal
- **key ecological functions**, including category codes as in Table KEF, and additional explanatory comments
- **key environmental correlates**, including category codes as in Table KEC, specifics on categories or values of the correlates, additional explanatory comments, and season(s) in which they apply
- **vegetation cover types and structural stages** selected by the species

Additional SER information on plants and allies includes:

- **population trend** category, where known
- **required pollinators**
- **life form**
- potential effects of various **management activities**, including exotic species, fire, grazing, logging, and mining
- correlations with **biophysical conditions**, including canopy cover, understory cover, climate, topography, geology, soil, substrates
- whether the species is a bioindicator

Full data dictionaries describing all tables and fields in the SER database are available.

A user-friendly front-end to the SER database and additional data (see below under the section Beyond the SER Database) is currently under development. This will be useful for making specific database queries and generating tables and reports.

SOME CAUTIONS AND CAVEATS IN ITS USE

The user of the SER database should be aware of some important shortcomings and conditions of the information.

1. Completeness of the SER data base.

Limits of time and funding, and the absence of prior comprehensive analyses of this type, meant focusing the work for plants on listed and potentially at-risk species. For invertebrates, it meant describing an important but selected set of ecological functions of species groups and detailing information on only a minuscule sampling of individual species. Luckily, fuller knowledge on vertebrates allowed us to address nearly all species. A

fuller analysis, beyond the scope of this study, still needs to be done on the entire flora and on a broader invertebrate fauna of the assessment area. For example, we have not described diversity and functions of parasitoids and parasites and of the many micropathogens present in the area. Disease and pathogenic effects may be critical factors limiting some plant and animal populations.

Specifically, the SER database information is incomplete in several ways: (a) only the rare macrofungi species are included; many other less rare macrofungi species likely occur in the assessment area; (b) lichens and bryophytes are included as species groups; species were grouped by growth substrate or by function; (c) only the more rare or at-risk vascular plants were included by species, although a number of unique plant communities are also part of the database; (d) only a small portion of the entire invertebrate fauna is included by species, as examples of particular taxonomic or ecological functional groups. Much basic field work remains to be done on invertebrate taxonomy and ecology.

Also, a few groups of soil microorganisms, including rotifers, bacteria, and nematodes, were included in the SER database, but these are far from being completely represented. Other groups of microorganisms, including microfungi, are not included. Little if any empirical work has been done on most groups of microorganisms in the assessment area.

2. Confidence in the information.

Most of the information compiled for this project did not come from empirical field experiments with controls and adequate sample sizes for statistical analysis; it came from surveys, individual observations from species experts, unpublished data provided by experts, and ongoing studies. Such information is reliable in that it came from among the best -- often the only -- local species experts. However, because of the dearth of scientific studies on most species, experts often expressed only moderate to low confidence in how well species are currently understood scientifically.

Also, experts sometimes disagreed or varied in their individual confidence in existing information of specific species. Our panel approach attempted to ameliorate such differences by collecting the full array of knowledge among experts rather than by trying to reach consensus on information included in the SER database.

The species information in this study -- particularly in the SER data base model -- is imprecise because it applies to a wide array of sites and habitats at the broad scale. None of the species considered in this assessment has been studied across this full range of habitats and environmental conditions present throughout the assessment area. Of the species studies that are available, none has looked at the full array of specific substrates, key environmental correlates, and key ecological functions. Also, few if any species studies rate as comprising replication with controls, experimental manipulation, and large sample sizes, empirical, validated relations, and peer review with publication in primary scientific journals. We expect that, over

time, local information and well-designed studies can substantially help improve at a finer resolution much of the broad-scale information we have gathered and broad-scale patterns we have deduced. However, some information, such as range-wide location data on rare plants and range maps of vertebrates, can only be produced at the broad scale.

3. Resolution of the environmental data.

The descriptions of vegetation cover types and their structural stages, as used in the habitat portion of the SER database, are based on vegetation classifications developed at a broad scale in the interior Columbia River Basin, using 1-km² resolution. This level of resolution is far too broad to identify more patch- or site-specific conditions and substrates, so important for describing habitats for most plants and invertebrates and for describing conditions at watershed and individual project levels. Our work must be seen as an initial step toward more site-specific evaluations.

4. Use of categorical data.

Much of the information on key environmental correlates and key ecological functions in the SER database is in the form of categories or descriptors, rather than quantitative or mathematical relations. This is because of the paucity of quantitative data or studies available on most species, especially across the range of conditions present in the assessment area.

5. Implications of the lack of field studies on most species.

The SER database cannot be fully specified for all species at this time because of incomplete scientific knowledge. There is a basic lack of empirical data on most species' environmental correlates within the assessment area. Although some of the vertebrates are relatively well known, many are not, and most plants, plant allies, and invertebrates are poorly studied. One implication of this lack of knowledge is that it is difficult or impossible to build habitat quality index models (such as habitat suitability index models, or GIS models of habitat quality gradients) for most species at this time.

6. Mismatch of spatial resolution with species habitats and environmental correlates.

The SER database does not depict environmental and habitat conditions for species at scale of resolution finer than the broad, coarse-grained scales used in this assessment. This scale mismatch is rather unavoidable for some species -- particularly most of the poorly-studied plants and allies and the invertebrates.

One implication of this scale mismatch is that the refinement and use of appropriately-scaled databases would have to await application at finer scales of geographic resolution, such as individual National Forest, BLM Districts, or watersheds. This is particularly so where information does exist on habitat or environmental correlates of species that respond to conditions too fine-grained for the current assessment and database.

One implication of developing an SER database at the broad scale for some species that respond to finer-scale conditions, has been that GIS and spatial models of species habitat and environment relations could not be developed for this assessment. This is because the GIS data simply were not fine-grained enough to depict the species habitats and environments.

An outcome of not being able to model in GIS all key environmental correlates of species is that, at least for generalist species, prediction of potential habitat tends to be grossly overestimated. At the broad scale of this assessment, such analyses tended to be insensitive to changes in environmental components represented poorly or not at all in the GIS models, such as snags, down wood, climatic factors, and human density. The solution is to develop more finer-grained GIS data for specific portions or habitats within the assessment area, thereby explicitly representing these other unmodeled correlates in the species GIS models. We hope that the SER database provides a common starting point for such further work.

THE NEED FOR TESTING

The SER database was compiled to answer very broad-scale questions about geographic patterns and environment relations throughout the Interior Columbia Basin. To use the SER database at levels of individual National Forests or BLM Districts, or at finer scales, the user might refine the contents of the SER to local conditions and apply their own biological judgment. Ideally, when the SER database or a refinement thereof is used as an aid in critical resource-management decisions, it should be accompanied by local validation testing or monitoring.

Essentially, the species-environment relations represented in the SER database constitute a set of hypotheses posed by species expert. The hypotheses describe how individual species or species groups might correlate with, or respond to, specific habitat conditions as affected by land management activities. Such hypotheses should be made explicit when using any information such as that in the SER database, and they can be formally tested through inventory, monitoring, and validation studies on selected species and environments. Such an approach fits well with the concept of adaptive management, by improving our knowledge and testing what we think we know.

BEYOND THE SER DATABASE

Also developed for the Interior Columbia Basin Ecosystem Management Project were a series of additional databases and maps, designed to be complementary to the SER database information. These additional databases and maps included the following:

Other Species Data Tables

Additional tables and data bases were provided by contractors and contributors on various species groups. These are not currently knit into the SER database

but are available as additional species checklists and, in some cases, additional information on geographic area of occurrence. They include databases or lists of:

- lichens, 775 species
- vascular plants: a draft CRB Flora Data Base, provided by USFS botanist Karl Urban, currently contains 8078 species; see below for further development plans

Species Range Maps and Biodiversity Maps

A total of 487 maps of species and biodiversity distribution were compiled for the project, in several formats: hard copy, ArcInfo, ArcView II, and Moss. (Not all maps are necessarily available in all formats.) They include:

Invertebrates: 14 range maps of selected taxa within the interior CRB assessment area.

Plants: compilation of State Heritage location data on rare and candidate plants within the interior CRB assessment area (heritage locations were included on ArcInfo and ArcView maps, but are not part of the above total); also 2 specific range maps on a cover type and a species.

Vertebrates: 471 species distribution maps on 29 amphibians, 26 reptiles, 315 birds, and 101 mammals.

Biodiversity maps (3 maps total):

- centers of concentration of biodiversity and high element occurrences for plants
- centers of concentration of biodiversity for animals (invertebrates and vertebrates, aquatic and terrestrial)
- "hot spots" of biodiversity where three or more biodiversity centers for plants or animals intersect

Species rarity and endemism maps (3 maps total):

- centers of concentration of species rarity and endemism for plants
- centers of concentration of species rarity and endemism for animals
- "hot spots" of centers of species rarity and endemism where three or more such centers of concentration for plants or animals intersect

POTENTIAL FUTURE DEVELOPMENT OF SER AND ANCILLARY DATA BASES

Several avenues of further database development might provide fruitful and useful for research, monitoring, and management:

- invertebrates: more inclusions of other examples and functional groups; possibly, explicit ties to the Hopkins U.S. Information System (HUSI) data base
- vascular plants: completion of the CRB Flora Data Base to include

- all approximately 9,000 species, listing at least current taxonomy, life form, and geographic occurrence
- completion of the user-friendly front-end for the SER model; compiling the entire query system and all data bases into a stand-alone model; publication and distribution on CD-ROM or appropriate medium (under development)

Data Dictionary for Inverts Database

June 21, 1995

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Table Name	Field name	Type	Definition
C-class			Environmental Correlate classification table.
	Record	N	Record number is related to the species name.
	Corno	N	Correlate Number. Definition of the correlate number can be found by querying the "Lookups" table in the "Corno" field. If the value for the correlate number is ≤ 10 then you can locate the definitions of the correlates by querying the "Kectbl" or "Keftbl" tables.
	C1	A2	First classification number
	C2	A2	Second classification number
	C3	A2	Third classification number
	C4	A2	Fourth classification number
See APPENDIX 1 for "Classification of Key Environmental Correlates" for a description of the codes..			
Corrtbl			Environmental Correlates. These correlates are related to 4 other tables, namely, Kectbl , Measures , Seasons , and C-class . Because the classification are related to these correlates, the user should include all five of the tables in their analysis. The tables by themselves may produce meaningless results. These correlates can be identified by there values of ≤ 10 .
	Corno	N	Correlate number. A composite of the correlate number and the record number keeps these record unique. Thus a record (species) may have multiple entries, with up to 10 correlates.
	Record	N	Record number. Records are related to species.

Correlates A60 Correlates. (Name of the correlate)

Disperse Dispersal table. Lists modes and requirements of dispersal.

Record N Record number. Records are related to species.

Dispmode A60 Mode of dispersal.

Dispreq A150 Requirements of dispersal.

F-class Key ecological functions classifications. The functions were classified according to Bruce Marcot's document "Classification of Key Ecological Functions"

Record N Record number. Records are related to species.

Kefno N Key ecological function number. This number along with the record number form a unique identifier that links to the description of the function in the "Keftbl"

F1 A2 First classification number

F2 A2 Second classification number

F3 A2 Third classification number

F4 A2 Fourth classification number

See APPENDIX 3 "Classification of Key Ecological Functions" for a description of the codes.

Geoarea Geographic area. Lists the geographic areas occupied by the species

Record N Record number. Records are related to species

Geoarhab A40 Geographic area.

See APPENDIX 4 for a list of the Geographic Areas used for invertebrates.

Habtbl Habitats.

Record	N	Record number. Records relate to species
VegCode	A17	Vegetation code
Structure	N	Structure code for the Vegetation.

See APPENDIX 5 for a description of possible Vegetation and Structure codes.

Header Contains information about the record such as the confidence of the information, trend, and other comments.

Record	N	Record number. Records are related to species.
Confidence	A1	Confidence level of the data rated 0 to 5 with 5 being the highest level of confidence.
Comments	A255	Comments.

Kectbl Correlate categories

Record	N	Record number. Records are related to species
Corno	N	Correlate number. Also relates to the "C-class", "Corrtbl", and the "Seasons" tables.
Cat	A60	Categories.

Keftbl Functions table

Record	N	Record number. Record number relates to species
Kefno	N	Function number. The composite of the "Kefno" and the record number create a unique identifier for each function by species (related thru the record number)
Kef	A140	The function

Lookups

This table serves as a lookup to table values. The data diagram shows the relationships to the table. This document also describes the relationships.

Attribute Name	A25	This is the main linking field for crosswalking codes in tables to their descriptions.
Corno	N	This field provides descriptions for Correlate numbers greater than 10. Values less than 11 are described in the "Corrtbl"
Attribute Description	A60	This is the description of either the "Attribute name" or the "Corno"

Measures

Describes the measures and some values by which the species was measured, and is related to correlates. To be meaningful, you must link to a correlate number in "Seasons" or "Corrtbl" to find what it is that you are measuring.

Record	N	Record number. Records are related to species,
Corno	N	Correlate number. Relates to "Corrtbl", "Seasons" and "C-class"
Measure	A20	Measure
Min	A10	Minimum of the measure
Max	A10	Maximum of the measure

Vegstrct

Plant habitats

Record	N	Record number. Records are related to species
VegCode	A18	Vegetation codes for the plant habitat. Also is linkable to the "Attributes names" field in the "Lookup" table. This also allows a link to CRBSUM thru the "Vegstruct" table

Structure	A4	Structure codes. These codes are a compilation of the structures in a VegCode.
StructId	N	Structure Id number. Relates to CRBSUM tables.
Structure name	A	Structure name for CRBSUM relates

See APPENDIX 5 for a description of the Structure codes and Structure Id's.

Record Master table of valid record numbers and the SPPCODE (species) that the record number represents.

Record	N	Record number
SPPCODE	A6	Species for the record number

Seasons Season table

Record	N	Record number. Records are related to species
Corno	N	Correlate number. The correlate number along with the record number creates a unique identifier that relates the proper seasons to the it's correlate. Related to "C-class", "Corrtbl", "Measures", and "Kectbl" tables
Season	A12	Season. Either/or a combination of winter, spring, summer, or fall.

Spp Species codes and other information such as common name, class, and scientific name.

SPPCODE	A6	Species code
Class	A2	Species class
Scientific name	A47	Scientific name

Common name	A42	Common name for the species
Family	A18	Family

Ustytbl		Understory characteristics for the species
Record	N	Record number. Records are related to species.
Understory	A4	Understory code. Related to the "Attribute names" field in the "Lookups" table

Valid codes for Ustytbl

Attribute Name	Attribute Description
-----	-----
Bar	Barren
Ctr	Conifer Trees
Grs	Grass
Htr	Hardwood Trees
Shr	Shrub

Vegcodes		Vegetation Codes.
VegCode	A17	Vegetation code
VegDesc	A50	Description of the Vegetation code.

See APPENDIX 5 for a description of Vegetation Codes.

Data Dictionary for Plants Database

June 21, 1995

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Table Name	Field name	Type	Definition
C-class			Environmental Correlate classification table.
	Record	N	Record number is related to the species name.
	Corno	N	Correlate Number. Definition of the correlate number can be found by querying the "Lookups" table in the "Corno" field. If the value for the correlate number is ≤ 10 then you can locate the definitions of the correlates by querying the "Kectbl" or "Keftbl" tables.
	C1	A2	First classification number
	C2	A2	Second classification number
	C3	A2	Third classification number
	C4	A2	Fourth classification number
			See APPENDIX 1 for "Classification of Key Environmental Correlates" for a description of the codes.
Climtbl			Lists the types of climates associated with a species. Related to the species name by the record number. Whenever an entry was made for "Ann-precip" then there is usually a value given in the "Ann-precip" field"
	Record	N	Record number. Records are related to species.
	Climate	A12	Climate type
	Ann-precip	A8	Precipitation - annually (inches)

Valid Codes for Climate table

Climate	Attribute Description
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Ann-precip Average Annual Precipitation (inches)
 Marit-climat Maritime influence (Higher humidity/more moist)
 Medit-climat Mediterranean influence (Dry summers)

Corrtbl			Environmental Correlates. These correlates are related to 4 other tables, namely, Kectbl , Measures , Seasons , and C-class . Because the classification are related to these correlates, the user should include all five of the tables in their analysis. The tables by themselves may produce meaningless results. These correlates can be identified by there values of <= 10.
	Corno	N	Correlate number. A composite of the correlate number and the record number keeps these record unique. Thus a record (species) may have multiple entries, with up to 10 correlates.
	Record	N	Record number. Records are related to species.
	Correlates	A60	Correlates. (Name of the correlate)

Cvrtbl			Cover table. This table lists the characteristics of the cover types entered that are associated with the a species. the "Characteristics" field is linkable to the "Attributes" field in the "Lookups" table to include the description in your analysis.
	Characteristics	A10	Characteristics of cover types associated with a species. Linkable to the "Attributes" field in the "Lookups" table to include the description in your analysis.
	Totalcover	N	Total canopy cover in forested communities measured in percentages.
	Oscanopy	N	Dominant overstory canopy cover in forested communities measured in percentages

Valid codes for Cvrtbl

Characteristics Attribute Description

Canopy1	Forested Community - 1 Canopy Layer
Canopy2	Forested Community - 2 Canopy Layers
Canopy3	Forested Community - 3 Canopy Layers
Lgtrees	Dominant Overstory Size Class - Large tree (>25.0" DBH)
Medtrees	Dominant Overstory Size Class - Medium tree (16.0-25.0" DBH)
Non34-66	Non-forested Community - 33-66% cover of dominant layer
Non6-33	Non-forested Community - 6-33% cover of dominant layer
Non<5	Non-forested Community - <5% cover of dominant layer
Non>66	Non-forested Community - >66% cover of dominant layer
Oscanopy	Forested Community Primary Overstory Canopy Cover
Poles	Dominant Overstory Size Class - Pole (5.0-8.9" DBH)
Seedling	Dominant Overstory Size Class - Seedling (<5.0" DBH)
Smtrees	Dominant Overstory Size Class - Small tree (9.0-15.9" DBH)
Totalcover	Total Canopy Cover - Forested Communities

Disperse		Dispersal table. Lists modes and requirements of dispersal.
Record	N	Record number. Records are related to species.
Dispmode	A60	Mode of dispersal.
Dispreq	A150	Requirements of dispersal.
Pollinators	A255	Pollenators.

Effects		Holds information about the effects of fire, exotics, grazing, grazing impacts, mining, and other effects.
Record	N	Record number. Records are related to species
Effects	A15	Type of effects.
Attributes	A15	The attribute of the effect for that species. This code can be linked to the "Attributes" field in the "Lookups" table to include an ancillary notation for that code.

Valid codes for Effects

Effects	Attribute	Description

Exotic-effects		
	Exotdir	Exotics cause direct displacement
	Exotindi	Exotics cause indirect competition
	Exotinhbsc	Exotics cause habitat structure change
	Exotinhib	Exotics inhibit recruitment
Fire		
	Fireact+	Effects of fire suppression activities positive
	Fireact-	Effects of fire suppression activities negative
	Fireact0	Effects off fire suppression activities neutral
	Fireosleth+	Effects of fire intensity - Overstory lethal positive
	Fireosleth-	Effects of fire intensity - Overstory lethal negative
	Fireosleth0	Effects of fire intensity - Overstory lethal neutral
	Fireosnleth+	Effects of fire intensity - Overstory non-lethal positive
	Fireosnleth-	Effects of fire intensity - Overstory non-lethal negative
	Fireosnleth0	Effects of fire intensity - Overstory non-lethal neutral
	Firesfpre+	Effects of late summer/fall prescribed fire positive
	Firesfpre-	Effects of late summer/fall prescribed fire negative
	Firesfpre0	Effects of late summer/fall prescribed fire neutral
	Firesppre+	Effects of spring prescribed fire positive
	Firesppre-	Effects of spring prescribed fire negative
	Firesppre0	Effects of spring prescribed fire neutral
	Firesup+	Historic fire suppression effects positive
	Firesup-	Historic fire suppression effects negative
	Firesup0	Historic fire suppression effects neutral
	Firewlf+	Effects of increased wildfire frequency positive
	Firewlf-	Effects of increased wildfire frequency negative
	Firewlf0	Effects of increased wildfire frequency neutral
Grazing		
	Efffag+	Effects of fall grazing positive
	Efffag-	Effects of fall grazing negative
	Efffag0	Effects of fall grazing neutral
	Effslg+	Effects of season-long grazing positive
	Effslg-	Effects of season-long grazing negative
	Effslg0	Effects of season-long grazing neutral
	Effspg+	Effects of spring grazing positive
	Effspg-	Effects of spring grazing negative
	Effspg0	Effects of spring grazing neutral
	Effsug+	Effects of summer grazing positive
	Effsug-	Effects of summer grazing negative
	Effsug0	Effects of summer grazing neutral
	Effwig+	Effects of winter grazing positive
	Effwig-	Effects of winter grazing negative
	Effwig0	Effects of winter grazing neutral

Grazing-impacts	
Grazdir	Grazing has indirect (i.e. habitat degradation) effects
Grazind	Grazing has direct (i.e. trample/consumed) effects
Logging	
Entryde	Logging impacts are direct (loss of plant)
Entryie	Logging impacts are indirect (loss of suitable habitat)
Entrynl	Tolerates no logging
Entrypc	Tolerates patch clearcut
Entryrc	Tolerates regen cut
Entrysh	Tolerates shelterwood
Entrysl	Tolerates selective logging
Entryth	Tolerates thinning
Mining	
Mine+	Effects of mining disturbance positive
Mine-	Effects of mining disturbance negative
Mine0	Effects of mining disturbance neutral

Eff-com	Effects comments. This table will hold comments about all the effects described in the "Effects" table. Link is by record number and "Effect"		
Record	N	Record number. Record number is related to species.	
Effect	A15	Effect. Related to "Effect" field in "Effects" table.	
Comment	A255	Comment	

Valid codes for Eff-com

- Effect
-
- Exotic-effects
- Fire
- Grazing
- Grazing-impacts
- Mining
- Other-threats
- Recreation

Endtbl		Endemism. Generally, the prevalent locality of the species.
Record	N	Record number. Records are related to species.
Endemism	A8	Endemic code for the species. This code can be linked to the "Attributes" field in the "Lookups" table for a description of the code.

Valid codes for Endtbl

Endemism	Attribute Description
-----	-----
Enddj	Endemism - Disjunct
Endle	Endemism - Local endemic
Endpe	Endemism - Peripheral
Endre	Endemism - Regional endemic
Endsc	Endemism - Scattered

See APPENDIX 2 for definitions of the endemism categories.

Endcom		Endemism comments.
Record	N	Record number. Records are related to species.
Comment	A100	Comments.

Exchange		Exotic plants that have the most chance of impact. This table is more meaningful when exotics are also queried from the "Effects" table. Other effects of exotics can be located by querying the "Eff-com" (Effects comments) field.
Record	N	Record number. Records are related to species.
Mostchance	A50	Exotic plants that have the most chance of impact.

F-class		Key ecological functions classifications. The functions were classified according to Bruce Marcot's document
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"Classification of Key Ecological Functions"

Record	N	Record number. Records are related to species.
Kefno	N	Key ecological function number. This number along with the record number form a unique identifier that links to the description of the function in the "Keftbl"
F1	A2	First classification number
F2	A2	Second classification number
F3	A2	Third classification number
F4	A2	Fourth classification number

See APPENDIX 3 "Classification of Key Ecological Functions" for a description of the codes.

Geology Geology. Describes the geology & soil characteristics associated with the species.

Record	N	Record number. Records are related to species.
Geo/Soil	A8	Geology or soil
Attribute	A15	Attribute for the Geology or Soil code. This can be linked to the "Attribute" field of the "Lookups" table for a description of the codes. Within the Attribute description, landform refers to the plants' position on the landscape, and geology refers to the composition of the substrate the plant is found on.

Valid codes for Geology

Geo\soil	Attribute	Attribute Description
Geology	Basalt	Geology - Basalt
Geology	Calcareous	Geology - Calcareous Rock
Geology	Clay	Geology - Clay (alluvium)
Geology	Glacial	Geology - Glacial Till and Landslides
Geology	Granite	Geology - Granite
Geology	Playa	Geology - Tuff
Geology	Rhyolite	Geology - Rhyolite
Geology	Sand	Geology - Sand (sandstone)
Geology	Sed/meta	Geology - Sedimentary/Metamorphic

Geology	Serpentine	Geology - Serpentine
Geology	Talus	Geology - Talus
Geology	Tuff	Geology - Playa
Geology	Cliff	Landform - Cliff
Geology	Ridgetop	Landform - Ridgetop
Geology	Scabland	Landform - Scablands
Geology	Valleybottom	Landform - Valley bottom
Soils	Acid	Soil pH - Acid
Soils	Alkaline	Soil pH - Alkaline
Soils	Coarstxtr	Soil Texture - Coarse (sand)
Soils	Deep	Soil Depth - Deep (40-60")
Soils	Finetxtr	Soil Texture - Fine
Soils	Mediumtxtr	Soil Texture - Medium
Soils	Mod-deep	Soil Depth - Moderately Deep (20-40")
Soils	Moist-andic	Soil Moisture Regime - Aridic
Soils	Moist-udic	Soil Moisture Regime - Udic
Soils	Moist-ustic	Soil Moisture Regime - Ustic
Soils	Moist-xeric	Soil Moisture Regime - Xeric
Soils	Neutral	Soil pH - Neutral
Soils	Shallow	Soil Depth - Shallow (10-20"
Soils	Temp-cryic	Soil Temperature - Cryic (0-8'C)
Soils	Temp-frigid	Soil Temperature - Frigid (diff. mean summer/winter = >5')
Soils	Temp-mesic	Soil Temperature - Mesic (8-15'C)
Soils	Verydeep	Soil Depth - Very Deep (>40")
Soils	Veryshallow	Soil Depth - Very Shallow (<10")

Geoarea Geographic area. Lists the geographic areas occupied by the species

Record N Record number. Records are related to species

Geoarhab A40 Geographic area.

See APPENDIX 4 for a list of the different Geographic Areas.

Header Contains information about the record such as the confidence of the information, trend, and other comments.

Record N Record number. Records are related to species.

Confidence A1 Confidence level of the data rated 0 to 5 with 5 being the highest level of confidence.

Trend A1 Trend rated 0 to 4

Comments A255 Comments.

Valid codes for Trend

- 0 - Blank
- 1 - Unknown
- 2 - Decreasing
- 3 - Stable
- 4 - Increasing

Indtbl

Indicators.

Record N Record number. Records are related to species

Indicator A15 Indicator. Related to the "Attribute" field in the "Lookups" table

Valid codes for Indtbl

Indicator Attribute Description

Airquality Air Quality
CaCO3 CaCO3
Flow-high Flow level, high water mark
Flow-low Flow level, low water mark
Grazdec Grazing decreaseers
Grazin Grazing increaseers
HighN High N
Metalrich Metal rich rock
Oldgrowth Old growth
Soiltemphigh Soil temperature (high)
Soiltemplo Soil temperature (low)
Texture-coarse Soil texture, coarse
Texture-fine Soil texture, fine

Indcom

Indicator comments

Record Record number. Records are related to species.

Comment A255 Comment. Related to the "Indtbl" by the record number.

Kectbl			Correlate categories
	Record	N	Record number. Records are related to species
	Corno	N	Correlate number. Also relates to the "C-class", "Corrtbl", and the "Seasons" tables.
	Cat	A60	Categories.

Keftbl			Functions table
	Record	N	Record number. Record number relates to species
	Kefno	N	Function number. The composite of the "Kefno" and the record number create a unique identifier for each function by species (related thru the record number)
	Kef	A140	The function

Lfrmtbl			Life forms
	Record	N	Record number
	Liform	A1	Life form number

Valid codes for Life form

#	Life Form	Description

VASCULAR PLANTS		
1	Phanerophytes	Species with perennating buds or shoot apices on aerial shoots. Group includes most woody shrubs or trees.
2	Chamaephytes	Species that hold their perennating buds and shoot apices very close to the ground. Group includes semi-woody and herbaceous species that persist above ground throughout the year (though not necessarily in a physiological active state). Group includes bunch grasses and cushion plants.

- | | | |
|---|------------------|--|
| 3 | Hemicryptophytes | Species with perennating buds at ground level, all parts above ground dying back at the end of the active growing season. Stolons may or may not be present. Group includes rosette plants (e.g. <u>Taraxacum</u>), partial rosette plants (e.g. <u>Achillea millefolium</u>), and stoloniferous species (e.g. <u>Rubus</u>). |
| 4 | Cryptophytes | Species bear their perennating buds below ground level or submerged in water. Group includes rhizomatous and bulb forming species (e.g. <u>Allium</u>), and aquatic species such as <u>Alisma</u> and <u>Nuphar</u> . |
| 5 | Therophytes | This is a group for annual species (e.g. <u>Bromus tectorum</u> or <u>Stephanomeria malheurensis</u>). |

FUNGI

- | | |
|---|------------|
| 1 | Mushroom |
| 2 | Resupinate |
| 3 | Truffle |
| 4 | Puffball |
| 5 | Polypore |

Lookups

This table serves as a lookup to table values. The data diagram shows the relationships to the table. This document also describes the relationships.

Attribute

- | | | |
|-----------------------|-----|--|
| Name | A25 | This is the main linking field for crosswalking codes in tables to their descriptions. |
| Corno | N | This field provides descriptions for Correlate numbers greater than 10. Values less than 11 are described in the "Corrtbl" |
| Attribute Description | A60 | This is the description of either the "Attribute name" or the "Corno" |

Measures

Describes the measures and some values by which the species was measured, and is related to correlates. To be meaningful, you must link to a correlate number in

"Seasons" or "Corrtbl" to find what it is that you are measuring.

Record	N	Record number. Records are related to species,
Corno	N	Correlate number. Relates to "Corrtbl", "Seasons" and "C-class"
Measure	A20	Measure
Min	A10	Minimum of the measure
Max	A10	Maximum of the measure

Vegstruct

Plant habitats

Record	N	Record number. Records are related to species
VegCode	A18	Vegetation codes for the plant habitat (cover type). Also is linkable to the "Attributes names" field in the "Lookup" table. This also allows a link to CRBSUM thru the "Vegstruct" table
Structure	A4	Structure codes. These codes are a compilation of the structures in a VegCode.
StructId	N	Structure Id number. Relates to CRBSUM tables.
Structure name	A	Structure name for CRBSUM relates

See APPENDIX 5 for a description of possible Vegetation codes and Structure Id's.

Record

Master table of valid record numbers and the SPPCODE (species) that the record number represents.

Record	N	Record number
SPPCODE	A6	Species for the record number

Seasons

Season table

Record	N	Record number. Records are related to species
Corno	N	Correlate number. The correlate number along with the record number creates a unique identifier that relates the proper seasons to the it's correlate. Related to "C-class", "Corrtbl", "Measures", and "Kectbl" tables
Season	A12	Season. Either/or a combination of winter, spring, summer, or fall.

Substrts

Substrates information

Record	N	Record number. Records are related to species.
Substrates	A15	Substrates
Attributes	A20	Attributes

Valid codes for Substrts

Substrates	Attribute	Description
-----	-----	-----
NonVeg	Many	- query "Substrt" for a detailed list
OtherNonVeg	Many	- query "Substrt" for a detailed list
OtherVeg	Many	- query "Substrt" for a detailed list
Veg	Many	- query "Substrt" for a detailed list

See APPENDIX 6 for a list of possible substrates.

Spp

Species codes and other information such as common name, class, and scientific name.

SPPCODE	A6	Species code
Class	A2	Species class
Scientific name	A47	Scientific name

Common name	A42	Common name for the species
-------------	-----	-----------------------------

Topotbl		Topography. Associated topography for the species.
Record	N	Record number. Records relate to species.
Topography	A15	Topography. These tables can be linked to the "Attribute names" field in the "Lookups" table.
Elev-min	N	If the topography shows "Elev-min" as a correlate then there may be a value shown in this field.
Elev-max	N	If the topography shows "Elev-max" as a correlate then there may be a value shown in this field.

Valid codes for Topotbl

Topography	Attribute Description
East	Aspect - East
Flat	Aspect - Flat
North	Aspect - North
Northerly	Aspect - Northerly
South	Aspect - South
Elev-max	Maximum Elevation (feet)
Elev-min	Minimum Elevation (feet)
Pos-low	Slope Position - Lower
Pos-mid	Slope Position - Middle
Pos-upper	Slope Position - Upper
Sl-flat	Slope - Flat (0-10%)
Sl-gentle	Slope - Gentle (11-30%)
Sl-steep	Slope - Steep (31-50%)
Sl-verysteep	Slope - Very Steep (>51%)
Southerly	Aspect - Southerly
West	Aspect - West

Ustytbl		Understory characteristics for the species
Record	N	Record number. Records are related to species.

Understory A4 Understory code. Related to the "Attribute names" field in the "Lookups" table

Valid codes for Ustytbl

Attribute Name	Attribute Description
Bar	Barren
Ctr	Conifer Trees
Grs	Grass
Htr	Hardwood Trees
Shr	Shrub

Vegcodes Vegetation Codes.

VegCode	A17	Vegetation code
VegDesc	A50	Description of the Vegetation code

See APPENDIX 5 for a description of the Vegetation codes.

Data Dictionary for Verts Database

June 21, 1995

K.Gutierrez
Spatial Team ICBEMP

Table Name	Field name	Type	Definition
C-class			Environmental Correlate classification table.
	Record	N	Record number is related to the species name.
	Corno	N	Correlate Number. Definition of the correlate number can be found by querying the "Lookups" table in the "Corno" field. If the value for the correlate number is ≤ 10 then you can locate the definitions of the correlates by querying the "Kectbl" or "Keftbl" tables.
	C1	A2	First classification number
	C2	A2	Second classification number
	C3	A2	Third classification number
	C4	A2	Fourth classification number
<p>See APPENDIX 1 for "Classification of Key Environmental Correlates" for a description of the codes.</p>			
Corrtbl			Environmental Correlates. These correlates are related to 4 other tables, namely, Kectbl , Measures , Seasons , and C-class . Because the classification are related to these correlates, the user should include all five of the tables in their analysis. The tables by themselves may produce meaningless results. These correlates can be identified by there values of ≤ 10 .
	Corno	N	Correlate number. A composite of the correlate number and the record number keeps these record unique. Thus a record (species) may have multiple entries, with up to 10 correlates.
	Record	N	Record number. Records are related to species.

Correlates A60 Correlates. (Name of the correlate)

Disperse Dispersal table. Lists modes and requirements of dispersal.

Record N Record number. Records are related to species.

Dispmode A60 Mode of dispersal.

Dispreq A150 Requirements of dispersal.

F-class Key ecological functions classifications. The functions were classified according to Bruce Marcot's document "Classification of Key Ecological Functions"

Record N Record number. Records are related to species.

Kefno N Key ecological function number. This number along with the record number form a unique identifier that links to the description of the function in the "Keftbl"

F1 A2 First classification number

F2 A2 Second classification number

F3 A2 Third classification number

F4 A2 Fourth classification number

See APPENDIX 3 for "Classification of Key Ecological Functions" for a description of the codes.

Geoarea Geographic area. Lists the geographic areas occupied by the species

Record N Record number. Records are related to species

Geoarhab A40 Geographic area.

See APPENDIX 4 for a list of the Geographic Areas used by vertebrates.

Habtbl Habitats.

Record	N	Record number. Records relate to species
VegCode	A17	Vegetation code
Structure	N	Structure code for the Vegetation.

See APPENDIX 5 for a description of possible Vegetation and Structure codes.

Header Contains information about the record such as the confidence of the information, trend, and other comments.

Record	N	Record number. Records are related to species.
Confidence	A1	Confidence level of the data rated 0 to 5 with 5 being the highest level of confidence.
Comments	A255	Comments.

Kectbl Correlate categories

Record	N	Record number. Records are related to species
Corno	N	Correlate number. Also relates to the "C-class", "Corrtbl", and the "Seasons" tables.
Cat	A60	Categories.

Keftbl Functions table

Record	N	Record number. Record number relates to species
Kefno	N	Function number. The composite of the "Kefno" and the record number create a unique identifier for each function by species (related thru the record number)
Kef	A140	The function

Lookups

This table serves as a lookup to table values. The data diagram shows the relationships to the table. This document also describes the relationships.

Attribute Name	A25	This is the main linking field for crosswalking codes in tables to their descriptions.
Corno	N	This field provides descriptions for Correlate numbers greater than 10. Values less than 11 are described in the "Corrtbl"
Attribute Description	A60	This is the description of either the "Attribute name" or the "Corno"

Measures

Describes the measures and some values by which the species was measured, and is related to correlates. To be meaningful, you must link to a correlate number in "Seasons" or "Corrtbl" to find what it is that you are measuring.

Record	N	Record number. Records are related to species,
Corno	N	Correlate number. Relates to "Corrtbl", "Seasons" and "C-class"
Measure	A20	Measure
Min	A10	Minimum of the measure
Max	A10	Maximum of the measure

Vegstruct

Plant habitats

Record	N	Record number. Records are related to species
VegCode	A18	Vegetation codes for the plant habitat. Also is linkable to the "Attributes names" field in the "Lookup" table. This also allows a link to CRBSUM thru the "Vegstruct" table

Structure	A4	Structure codes. These codes are a compilation of the structures in a VegCode.
StructId	N	Structure Id number. Relates to CRBSUM tables.
Structure name	A	Structure name for CRBSUM relates

See APPENDIX 5 for a description of Structure codes and Structure Id's.

Record Master table of valid record numbers and the SPPCODE (species) that the record number represents.

Record	N	Record number
SPPCODE	A6	Species for the record number

Seasons Season table

Record	N	Record number. Records are related to species
Corno	N	Correlate number. The correlate number along with the record number creates a unique identifier that relates the proper seasons to the it's correlate. Related to "C-class", "Corrtbl", "Measures", and "Kectbl" tables
Season	A12	Season. Either/or a combination of winter, spring, summer, or fall.

Spp Species codes and other information such as common name, class, and scientific name.

SPPCODE	A6	Species code
Class	A2	Species class
Scientific name	A47	Scientific name
Common		

name	A42	Common name for the species
Tax	A3	Taxonomic group
Family	A18	Family

Ustytbl

Understory characteristics for the species

Record	N	Record number. Records are related to species.
Understory	A4	Understory code. Related to the "Attribute names" field in the "Lookups" table

Valid codes for Ustytbl

Attribute Name	Attribute Description
-----	-----
Bar	Barren
Ctr	Conifer Trees
Grs	Grass
Htr	Hardwood Trees
Shr	Shrub

Vegcodes

Vegetation Codes.

VegCode	A17	Vegetation code
VegDesc	A50	Description of the Vegetation code.

See APPENDIX 5 for a description of Vegetation codes.

September 27, 1995

CRBSTATS.db- DATA BASE DICTIONARY

-Entire list of all vertebrates within the Interior Columbia River Basin and some associated statistics of each species that are described below.

Column Descriptions in Order of Occurrence

Class(A2): A - Amphibian

B - Bird

M - Mammal

R - Reptile

Tax(A3): Number to put species in taxonomic order

Family(A18): Family name of vertebrates

Scientific name(A47)

Common name(A42)

% Range(A2)

A = nearly all (80-99%) of the overall species range occurs outside CRB

B = more than half, but not nearly all (60-79%) occurs outside CRB

C = about half (40-59%) occurs outside CRB

D = less than half, but not only a very small portion (20-39%) occurs outside CRB

E = only a very small portion (0-19%) occurs outside CRB

NEO(A2) - Neotropical Migrant Status

A = long-distance migrant (south of the United States)

B = short-distance migrant

Endemism(A2)

LE = Locally Endemic

Populations are restricted to a very small area (ie., one portion of a mountain range, one canyon, etc.) These taxa may also be restricted to highly specialized habitats. The range may lie entirely within, or on the CRB Assessment Area boundary.

RE = Regionally Endemic

Populations inhabit a larger geographic area than that of the local endemics (i.e., southeast Oregon, the Palouse etc.) These species may also be closely associated with certain habitats, and their range may lie entirely within, or on the CRB Assessment Area boundary.

PE = Peripheral

Populations lie on the margins of the CRB Assessment Area boundary or in the case of some bird species completely outside of the CRB. Birds such as the Pacific loon are casual visitors away from the normal species range.

DI = Disjunct

Populations in the CRB Assessment Area are substantially separated geographically from the remainder of the species range.

SC = Scattered

Populations are sparsely distributed within the CRB Assessment Area. In the case of birds this might indicate specialized habitats for wintering, migrating or breeding.

CO = Common

Not to be confused with the abundance "common", this refers to populations. Populations can be common but not have a large number of individuals. For example, mountain lion populations are probably common within the northwest. However, each population has a relatively small number of individuals. In contrast some species such as the spotted frog in eastern Oregon may have just a few scattered populations with many individuals in each population. The spotted frog would go into the scattered category.

BRSTS(A3) - Breeding Status

R = Resident

A bird species that breeds in the State and can be seen there all year round.

B = Breeding

A species that breeds in the state but winters elsewhere

N = Non-breeding summer resident

This is an unusual situation. Only a few birds in the northwest fall within this category. One example is the Blue Jay which does not breed anywhere in the northwest but a quite a few hang around all summer in northwestern Wyoming.

W = Wintering

Bird species that spend the winter and breed elsewhere.

M = Migrants

Bird species present only in the spring and fall as they fly between wintering and breeding areas.

ABUN(A3) - Abundance

I = Irregular

Usually seen in low numbers and not seen every year. An example would be the Pacific Loon which is seen in some years in low numbers along the Columbia river in Oregon. Another example is the Snowy Owl which is uncommon in the northwest when winters are hard farther north but completely absent in most years.

R = Rare

Seen every year in very low numbers. The Pacific Loon for example is rare in Washington.

There are usually less than ten sightings each year. While the Pacific loon is out of its normal range when sighted inland other species can be rare within their breeding range. For example the black-backed woodpecker is a year round resident of Montana, It breeds there but it is at the edge of its range and is rarely seen because the populations are small.

U = Uncommon

It is unlikely that you would see birds in this category unless you knew exactly when and where to look. Even then there is no guarantee. Their populations are larger than that of rare birds but still not always seen when expected.

C = Common

Within the right habitat and season you could expect to see a bird in this category every time you went looking.

A = Abundant

Within the right habitat and season birds in this category would seem to be everywhere.

STATE CODES

The two letter code listed for each species of bird in each of the assessment area states is a combination of the breeding status (first letter) and abundance (second letter).

September 1, 1995

QSPEC.DB - DATA BASE DICTIONARY

-Entire list of: all vertebrates; plants (including bryophytes and fungi) and plant groups of concern; invertebrates of concern; and functional groups of invertebrates within the Interior Columbia River Basin.

COLUMN DESCRIPTIONS

Class (A2): A - Amphibian

B - Bird

BG - Bryophyte group

I - Invertebrate

L - Lichen

LG - Lichen group

M - Mammal

NV - Non-vascular

P - Plant

PG - Plant group

R - Reptile

Tax(A3) - Number to put species in taxonomic order

Order(A18)

Family(A18)

SPPCODE(A6) - 6 digit code

Scientific name(A47)

Common name(A42)

USFWS(A3) - U.S. Fish and Wildlife Service status designation

FE - Federally Endangered

FT - Federally Threatened

FPE - Federally Proposed Endangered

FPT - Federally Proposed Threatened

FC1 - Federal Category 1 Candidate

FC2 - Federal Category 2 Candidate

3C - Federal Category 3 Candidate-NOT a complete list

FS(A3) - S = Forest Service Sensitive in any state

BS(A3) - S = Bureau of Land Management in any state

EXT(A3) - X = Extinct or Extirpated in part or all of it's range- includes status from Oregon (ONHP list 1-ex or 2-ex), WA (TNC rank), and (ID INPS) - see COMMENTS for details and locations.

LISTS(A4) - N = Listed in the NRDC petition

T = Listed by the tribes as a species of concern/use

DTB(A1) - X = Form was filled out, species in the SERS database

OR STATUS(A10) - Compilation of other than Federal Status for that species in Oregon

FS - Forest Service Sensitive

FT - Forest Service Threatened (= Federal Threatened)
FE - Forest Service Endangered (= Federal Endangered)
BS - Bureau of Land Management Sensitive
BA - Bureau of Land Management Assessing
S_ - State Status - see attachment for descriptions

WA STATUS(A10) - Compilation of other than Federal Status in Washington
(see OR STATUS for description)

ID STATUS(A10) - Compilation of other than Federal Status in Idaho
(see OR STATUS for description)

MT STATUS(A10) - Compilation of other than Federal Status in Montana
(see OR STATUS for description)

WY STATUS(A10) - Compilation of other than Federal Status in Wyoming
(see OR STATUS for description)

NV STATUS(A10) - Compilation of other than Federal Status in Nevada
(see OR STATUS for description)

F-OR(A3) - S = Forest Service Oregon Sensitive Species
F-WA(A3) - S = Forest Service Washington Sensitive Species
F-ID(A3) - S = Forest Service Idaho Sensitive Species
F-MT(A3) - S = Forest Service Montana Sensitive Species
F-WY(A3) - S = Forest Service Wyoming Sensitive Species
F-NV(A3) - S = Forest Service Nevada Sensitive Species
B-OR(A2) - S = Bureau of Land Management Sensitive Oregon
A = Bureau of Land Management Assessing Oregon
B-WA(A2) - Same as B-OR but for Washington
B-ID(A1) - Same as B-OR but for Idaho
B-MT(A1) - Same as B-OR but for Montana (is blank?)
B-WY(A1) - Same as B-OR but for Wyoming (is blank?)
B-NV(A1) - Same as B-OR but for Nevada (is blank?)
ODF&W(A2) - Oregon Department of Fish and Wildlife AND Oregon Department
of
Agriculture (see attached for description)

WDF&W(A2) - Washington Department of Fish and Wildlife AND Washington
Department of Natural Resources (see attached for description)

IDF&G(A4) - Idaho Department of Fish and Game AND Idaho Native Plant Society
(see attached)

MDFW&P(A3) - Montana Department of Fish Wildlife and Parks AND Montana
Natural Heritage (see attached)

NDF&W(A3) - Nevada Department of Fish and Wildlife AND Nevada Division of
Forestry (see attached)

Comments(A29) - if extirpated, where extirpated, etc.

June 21, 1994

WILDLIFE

IDAHO: Idaho Department of Fish and Game

Species of Special Concern

SA - Category A - Priority Species

SP - Category B - Peripheral Species

SU - Category C - Undetermined Species

WASHINGTON - Washington Department of Wildlife

Species of Special Concern

SE - State Endangered

ST - State Threatened

SS - State Sensitive

SC - State Candidate

SM - State Monitor

OREGON - Oregon Department of Fish and Wildlife

State Sensitive Species

SC - State Critical

SV - State Vulnerable

SP - State Peripheral/Rare

SU - State Undetermined

MONTANA - Department of Fish, Wildlife and Parks

Animal Species of Special Concern

SE - State Endangered

SP - State Protected

not included:

GA - game animal

FB - furbearing animal

MB - migratory bird

UB - upland gamebird

NG - nongame species

SU - unprotected species

NEVADA -

SP - State Protected

SS - State Sensitive (includes extra from heritage)

ST - State Threatened

SE - State Endangered

PLANTS

IDAHO - Idaho Native Plant Society

S1 - State Priority 1

S2 - State Priority 2

SS - State Sensitive

SX - Historical/Extirpated

not included:

SM - State Monitor-no identifiable threats

SR - State Review-insufficient data

WASHINGTON- Washington Department of Natural Resources

SE - State Endangered

ST - State Threatened

SS - State Sensitive

SX - State Extinct/Extirpated (TNC rank)

OREGON - Oregon Department of Agriculture

SE - State Endangered

ST - State Threatened

SC - State Candidate

not included:

List 1 - Threatened, endangered, or presumed extinct (ONHP)

List 2 - Threatened, endangered, or extirpated from Oregon, more common elsewhere (ONHP)

List 3 - "Review List", need more information (ONHP)

List 4 - Rare, or too common, "Watch List" (ONHP)

MONTANA -

SSC - Species of Special Concern (MNHP)

'S' - follow-up needed

not included:

State Rank - as developed by the Natural Heritage Program

NEVADA - Nevada Division of Forestry

SCE - State Critically Endangered

SE# - Recommended for SE, pending formal listing

SE - Endangered (NNNPS)

ST - Threatened (NNNPS)

not included:

CY - Protected as Cactus, Yucca, or Christmas Tree

SW - Watch, need more information (NNNPS)

SD - Deleted from consideration (NNNPS)

SA - Absent, included on past lists (NNNPS)

BLM

BS - Bureau Sensitive

BA - Bureau Assessment

not included:

BT - Bureau Tracking, not considered a special status species for management.

COLUMN DESCRIPTIONS

Common name

Class: A - Amphibian

B - Bird

I - Invertebrate

M - Mammal

NV - Non-vascular

P - Plant

R - Reptile

Scientific name

USFWS - U.S. Fish and Wildlife Service status designation

FE - Federally Endangered

FT - Federally Threatened

FPE - Federally Proposed Endangered

FPT - Federally Proposed Threatened

FC1 - Federal Category 1 Candidate

FC2 - Federal Category 2 Candidate

3C - Federal Category 3 Candidate

FS - S = Forest Service Sensitive in any state

BS - S = Bureau of Land Management in any state

LISTS - N = Listed in the NRDC petition

T = Listed by the tribes as a species of concern/use

APPENDIX 1

CLASSIFICATION OF KEY ENVIRONMENTAL CORRELATES

updated 7 June 1995

- b marcot

Terrestrial Staff, Science Integration Team

This is a classification of key environmental correlates related to individual species and species groups, as used by the Terrestrial Staff of the Science Integration Team.

The numbered codes in this classification are strictly hierarchical (e.g., item 1.1.2 is one element of 1.1, which is one element of the broadest-level category 1). These codes are to be used in the Species Models Data Base.

- 1 Vegetation elements
 - 1.1 cover types (SAF, SRM, CRB)
 - 1.2 structural stages
 - 1.2.1 SAF stages
 - 1.2.2 SRM stages
 - 1.2.3 CRB stages
 - 1.2.4 Other stages used to denote plant response
 - 1.2.4.1 regeneration cut
 - 1.2.4.2 selectively logged
 - 1.2.4.3 thinned
 - 1.2.4.4 patch clearcut
 - 1.2.4.5 shelterwood
 - 1.2.4.6 overstory removal
 - 1.3 forest or woodland vegetation substrates
 - 1.3.1 down wood (includes coarse woody debris, "CWD")
 - 1.3.1.1 down wood in riparian zone
 - 1.3.2 snags (entire tree dead)
 - 1.3.2.1 bark piles at base of snag
 - 1.3.3 mistletoe brooms
 - 1.3.4 litter
 - 1.3.5 duff
 - 1.3.6 shrubs
 - 1.3.7 fruits/seeds/mast
 - 1.3.7.1 seed caching
 - 1.3.8 dead parts of live trees
 - 1.3.9 moss
 - 1.3.10 trees

- 1.3.10.1 exfoliating bark
 - 1.3.11 flowers
 - 1.3.12 lichens
 - 1.3.13 bark
 - 1.3.14 forbs (grass)
 - 1.3.15 cactus
 - 1.3.16 fungi
 - 1.3.17 roots, tubers, underground plant parts
 - 1.3.18 peatlands
 - 1.4 herbaceous vegetation elements or substrates
 - 1.4.1 herbaceous vegetation cover
 - 1.4.1.1 aquatic submergent vegetation
 - 1.4.2 fruits/seeds
 - 1.4.3 moss
 - 1.4.4 cactus
 - 1.4.5 flowers
 - 1.4.6 shrubs
 - 1.4.7 fungi
 - 1.4.8 forbs
 - 1.4.9 bulbs/tubers
 - 1.4.10 cryptogammic crusts
 - 1.5 diversity of vegetation cover types
 - 1.6 edges
 - 1.6.1 openings
 - 1.6.2 meadows
 - 1.7 mycorrhizal associations
- 2 Biological (non-vegetation) elements
- 2.1 presence of prey species (including small mammals, insects, birds, other spp.)
 - 2.1.1 carrion
 - 2.2 presence of predators
 - 2.2.1 absence of predator
 - 2.3 presence of exotic species
 - 2.3.1 exotic plants
 - 2.3.2 exotic animals
 - 2.4 insect irruption areas
 - 2.4.1 mountain pine beetle
 - 2.4.2 spruce budworm
 - 2.4.3 gypsy moth
 - 2.5 presence of burrows or presence of burrowing mammals
 - 2.6 grazing
 - 2.6.1 direct effects (trample, consumed)
 - 2.6.2 indirect effects (habitat degradation)
 - 2.6.3 seasonality of grazing
 - 2.7 presence of beaver or muskrat ponds or lodges
 - 2.8 presence of nesting structures
 - 2.8.1 cavities

- 2.8.2 platforms
- 2.9 presence of other species
 - 2.9.1 positive or neutral effect
 - 2.9.2 negative effect
- 2.10 forest pathogens
- 2.11 colonial nester
- 3 Non-vegetation terrestrial substrates
 - 3.1 rocks
 - 3.1.1 gravel
 - 3.2 soils
 - 3.2.1 soil class
 - 3.2.2 soil depth
 - 3.2.3 soil texture
 - 3.2.3.1 sand/dunes
 - 3.2.3.2 soil suitable for burrowing vertebrates
 - 3.2.3.3 soil suitable for burrowing invertebrates
 - 3.2.4 soil pH
 - 3.2.5 soil temperature
 - 3.2.6 soil moisture
 - 3.2.7 soil chemistry
 - 3.2.8 soil organic matter
 - 3.3 lithic (rock) substrates
 - 3.3.1 lithic series or types (including lithic formations such as Jefferson limestone)
 - 3.3.1.1 granite
 - 3.3.1.2 basalt
 - 3.3.1.3 rhyolite
 - 3.3.1.4 sedimentary and metamorphic (fine grained rock), including limestone
 - 3.3.1.5 calcareous rock
 - 3.3.1.6 serpentine
 - 3.3.1.7 sand (sandstone)
 - 3.3.1.8 clay (alluvium)
 - 3.3.1.9 glacial till and landslides
 - 3.3.1.10 playa (alkaline, saline)
 - 3.3.1.11 tuff (volcanic ash)
 - 3.3.1.12 metal rich
 - 3.3.1.13 pumice
 - 3.3.2 avalanche chute
 - 3.3.3 cliff
 - 3.3.4 talus
 - 3.3.5 boulder, large rocks
 - 3.3.6 cave
 - 3.3.7 rock outcrops/crevices
 - 3.3.8 lava flows
 - 3.3.9 [blank]
 - 3.3.10 lava tubes
 - 3.3.11 canyons

- 3.3.12 barren ground
- 3.3.13 rugged terrain
- 3.3.14 rocky ridges
- 3.3.15 ravine
- 3.3.16 cirque or basins (also see entry 5.7 below)
- 3.4 snow
 - 3.4.1 snow depth (winter)
 - 3.4.2 glaciers, snow fields
- 3.5 water characteristics
 - 3.5.1 dissolved oxygen
 - 3.5.2 water depth
 - 3.5.3 dissolved solids
 - 3.5.4 water pH
 - 3.5.5 water temperature
 - 3.5.6 water velocity
 - 3.5.7 water turbidity
- 3.6 forages above tree canopy
- 4 Riparian and aquatic bodies
 - 4.1 rivers
 - 4.1.1 riverine wetlands
 - 4.1.2 oxbows
 - 4.2 streams (permanent or seasonal)
 - 4.2.1 intermittent
 - 4.2.2 rocks in streams
 - 4.3 seeps or springs (including warm seeps or springs)
 - 4.4 exposed mudflats, sand bars
 - 4.5 sand bars, unconsolidated shore
 - 4.6 gravel bars
 - 4.7 shallow water
 - 4.8 lakes or reservoirs (lacustrine)
 - 4.8.1 lakes with submergent vegetation
 - 4.8.2 lakes with floating mats
 - 4.8.3 lakes with silt or mud bottom
 - 4.8.4 lakes with emergent vegetation
 - 4.8.5 alkaline lake beds
 - 4.9 ponds (permanent or seasonal)
 - 4.9.1 ponds with submergent vegetation
 - 4.9.2 ponds with floating mats
 - 4.9.3 ponds with silt or mud bottoms
 - 4.9.4 ponds with emergent vegetation
 - 4.10 wetlands, marshes, or wet meadows (palustrine)
 - 4.10.1 bulbs or tubers in wetlands, marshes, or wet meadows
 - 4.10.2 Phragmites
 - 4.11 bogs or fens
 - 4.12 swamps
 - 4.13 islands

- 4.14 waterfalls
- 4.15 hyporheic zone
- 4.16 irrigation ditches
- 4.17 ephemeral pools
- 4.18 deciduous riparian, including willow and cottonwood
- 4.19 vernal or seasonal flooding or flood plains
- 4.20 bottomlands
- 4.21 water table
- 5 Topographic or physiographic elements
 - 5.1 elevation
 - 5.2 slope
 - 5.3 aspect
 - 5.4 slope position
 - 5.5 ridge tops
 - 5.6 plateau
 - 5.7 convex or concave basin (also see entry 3.3.16 above)
 - 5.8 flat
 - 5.9 mima
- 6 Climate
 - 6.1 precipitation (amount, pattern, seasonality)
 - 6.2 Mediterranean influence (dry summers)
 - 6.3 maritime influence (higher humidity and more moisture)
 - 6.4 temperature
 - 6.5 humidity
 - 6.6 wind
- 7 Fire
 - 7.1 recency
 - 7.1.1 recent fire
 - 7.1.2 old fire
 - 7.2 effects of fire suppression activities
 - 7.2.1 positive effect
 - 7.2.2 negative effect
 - 7.2.3 neutral effect
 - 7.3 fire frequency
 - 7.3.1 positive effect
 - 7.3.2 negative effect
 - 7.3.3 neutral effect
 - 7.4 fire intensity
 - 7.4.1 overstory lethal
 - 7.4.1.1 positive effect
 - 7.4.1.2 negative effect
 - 7.4.1.3 neutral effect
 - 7.4.2 overstory non-lethal
 - 7.4.2.1 positive effect
 - 7.4.2.2 negative effect
 - 7.4.2.3 neutral effect

- 7.5 prescribed fire
 - 7.5.1 spring prescribed fire
 - 7.5.1.1 positive effect
 - 7.5.1.2 negative effect
 - 7.5.1.3 neutral effect
 - 7.5.2 late summer or fall prescribed fire
 - 7.5.2.1 positive effect
 - 7.5.2.2 negative effect
 - 7.5.2.3 neutral effect
- 7.6 historic fire suppression
 - 7.6.1 positive effect
 - 7.6.2 negative effect
 - 7.6.3 neutral effect
- 8 Human disturbance elements
 - 8.1 recreation areas and activities (including dispersed camping areas)
 - 8.1.1 positive effect
 - 8.1.2 negative effect
 - 8.2 roads or trails
 - 8.2.1 positive effect
 - 8.2.2 negative effect
 - 8.3 residential development
 - 8.3.1 positive effect
 - 8.3.2 negative effect
 - 8.4 buildings
 - 8.4.1 positive effect
 - 8.4.2 negative effect
 - 8.5 bridges
 - 8.5.1 positive effect
 - 8.5.2 negative effect
 - 8.6 tunnels (for mines, see above under Non-vegetation terrestrial substrates)
 - 8.6.1 positive effect
 - 8.6.2 negative effect
 - 8.7 agriculture and croplands
 - 8.7.1 positive effect
 - 8.7.2 negative effect
 - 8.8 livestock (disease)
 - 8.8.1 positive effect
 - 8.8.2 negative effect
 - 8.9 mines and mining activities
 - 8.9.1 positive effect
 - 8.9.2 negative effect
 - 8.9.3 neutral effect
 - 8.10 harvest (including legal hunting, legal trapping, and illegal poaching of animals)
 - 8.10.1 positive effect
 - 8.10.2 negative effect
 - 8.11 fences

- 8.11.1 positive effect
- 8.11.2 negative effect
- 8.12 bird feeders
 - 8.12.1 positive effect
 - 8.12.2 negative effect
- 8.13 winter recreation
 - 8.13.1 positive effect
 - 8.13.2 negative effect
- 8.14 garbage
 - 8.14.1 positive effect
 - 8.14.2 negative effect
- 8.15 logging
 - 8.15.1 positive effect
 - 8.15.2 negative effect
- 8.16 nest box
 - 8.16.1 positive effect
 - 8.16.2 negative effect
- 8.17 perch structures
 - 8.17.1 positive effect
 - 8.17.2 negative effect
- 8.18 platforms
 - 8.18.1 positive effect
 - 8.18.2 negative effect
- 8.19 guzzlers
 - 8.19.1 positive effect
 - 8.19.2 negative effect
- 8.20 pesticide use
- 8.21 exotic plant effects
 - 8.21.1 direct displacement
 - 8.21.2 indirect competition
 - 8.21.3 inhibit recruitment
 - 8.21.4 habitat structure change
- 8.22 livestock grazing strategies
 - 8.22.1 season-long
 - 8.22.1.1 positive effect
 - 8.22.1.2 negative effect
 - 8.22.1.3 neutral effect
 - 8.22.2 spring grazing
 - 8.22.2.1 positive effect
 - 8.22.2.2 negative effect
 - 8.22.2.3 neutral effect
 - 8.22.3 summer grazing
 - 8.22.3.1 positive effect
 - 8.22.3.2 negative effect
 - 8.22.3.3 neutral effect
 - 8.22.4 fall grazing

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- 8.22.4.1 positive effect
- 8.22.4.2 negative effect
- 8.22.4.3 neutral effect

- 9 Barriers to movement
 - 9.1 forest management (clearcuts)
 - 9.2 canopy closure
 - 9.3 agriculture
- 10 Natural disturbance -- floods, scouring, openings in forests

APPENDIX 2

ENDEMISM: - Definitions

Endle = Locally Endemic

Populations are restricted to a very small area (ie., one portion of a mountain range, one canyon, etc.) These taxa may also be restricted to highly specialized habitats. The range may lie entirely within, or on the CRB Assessment Area boundary.

Endre = Regionally Endemic

Populations inhabit a larger geographic area than that of the local endemics (i.e., southeast Oregon, the Palouse etc.) These species may also be closely associated with certain habitats, and their range may lie entirely within, or on the CRB Assessment Area boundary.

Endpe = Peripheral

Populations lie on the margins of the CRB Assessment Area boundary or in the case of some bird species completely outside of the CRB. Birds such as the Pacific loon are casual visitors away from the normal species range.

Enddj = Disjunct

Populations in the CRB Assessment Area are substantially separated geographically from the remainder of the species range.

Endsc = Scattered

Populations are sparsely distributed within the CRB Assessment Area. In the case of birds this might indicate specialized habitats for wintering, migrating or breeding.

Endco = Common

Not to be confused with the abundance "common", this refers to populations. Populations can be common but not have a large number of individuals. For example, mountain lion populations are probably common within the northwest. However, each population has a relatively small number of individuals. In contrast some species such as the spotted frog in eastern Oregon may have just a few scattered populations with many individuals in each population. The spotted frog would go into the scattered category.

APPENDIX 3

Classification of Key Ecological Functions Terrestrial Staff, Scientific Integration Team

- b g marcot
updated 7 June 1995

- 1 Trophic relationships
 - 1.1 primary producer (chlorophyllous vascular plants)
 - 1.1.1 autotrophic (fully independent chlorophyllous plants)
 - 1.1.2 hemiparasitic (chlorophyllous plants that also partially derive nutrients via attachment to other chlorophyllous plants)
 - 1.2 heterotrophic consumer
 - 1.2.1 primary consumer (herbivore) (also see below under Herbivory)
 - 1.2.1.1 foliovore (leaf-eater)
 - 1.2.1.2 spermivore (seed-eater)
 - 1.2.1.3 browser
 - 1.2.1.4 grazer
 - 1.2.1.5 frugivore (fruit eater)
 - 1.2.1.6 sap feeding (sucking insects)
 - 1.2.1.7 root feeders (invertebrates)
 - 1.2.1.8 sequesters plant metabolites
 - 1.2.2 secondary consumer (primary predator or carnivore)
 - 1.2.2.1 consumer or predator of invertebrates, potentially including insects (insectivorous)
 - 1.2.2.2 consumer or predator of vertebrates (other species than itself)
 - 1.2.3 tertiary consumer (secondary predator or carnivore)
 - 1.2.3.1 consumer of soil microorganisms
 - 1.2.4 largely omnivorous (plants and animals consumed)
 - 1.2.5 carrion feeder
 - 1.2.6 cannibalistic
 - 1.2.7 coprophagous (feeds on fecal material)
 - 1.2.8 aquatic herbivore (invertebrates)
 - 1.2.9 feeds in water on algae, ooze, and plankton (invertebrates)
 - 1.3 achlorophyllous vascular plants (see 1.9 below for nonvasculars)
 - 1.3.1 mycotrophic (indirectly parasitic, non-green plants that derive nutrients from mycorrhizal fungi that are also associated with a chlorophyllous species that serves as the indirect host)
 - 1.3.2 saprophytic (derive nutrients from decaying organic matter via mycorrhizal fungi)
 - 1.3.3 parasitic (derive nutrients via direct attachment to chlorophyllous plants)

- 1.3.3.1 root parasites
- 1.3.3.2 stem parasites
- 1.4 detritivore (feeds directly on dead organic material)
- 1.5 decomposer (feeds on byproducts of decaying organic material)
- 1.6 commutator (chewing insects, typically on wood or vegetation)
- 1.7 forage or prey relations
 - 1.7.1 forage for animals
 - 1.7.2 prey for secondary or tertiary consumer (primary or secondary predator or carnivore)
 - 1.7.3 carrion source
 - 1.7.4 forage for invertebrates
- 1.8 major biomass
- 1.9 achlorophyllous non-vascular plants (see 1.3 above for vasculars)
 - 1.9.1 mycorrhizal
 - 1.9.2 saprophytic
 - 1.9.3 parasitic
 - 1.9.4 decomposer
- 1.10 moss feeder (invertebrates)
- 2 Herbivory
 - 2.1 ungulate herbivory (may influence rate or trajectory of vegetation succession and presence of plant species)
 - 2.1.1 herbivory on tree or shrub species (browsers)
 - 2.1.2 herbivory on grasses or forbs (grazers)
 - 2.2 insect herbivory (may influence rate or trajectory of vegetation succession or presence of plant species)
 - 2.2.1 defoliators
 - 2.2.2 bark beetles
 - 2.2.3 tree bole feeders
- 3 Nutrient cycling relationships (see below for nutrient cycling relationships in soil)
 - 3.1 aids in physical transfer of substances for nutrient cycling (C,N,P, other)
 - 3.2 nitrogen relationships
 - 3.2.1 N-fixer
 - 3.2.2 N-immobilizer
 - 3.2.3 source for N mineralization
 - 3.3 carbon relationships
 - 3.3.1 sequestration of atmospheric carbon
- 4 Interspecies relationships
 - 4.1 insect control
 - 4.2 ungulate or other vertebrate population control
 - 4.3 pollination vector
 - 4.4 transportation of seed, spores, plant or animal disseminules
 - 4.4.1 disperses fungi
 - 4.4.2 disperses lichens
 - 4.4.3 disperses bryophytes, including mosses
 - 4.4.4 disperses insects

- 4.4.5 disperses seeds/fruits
- 4.4.6 disperses plants
- 4.5 commensal or mutualist with other species
- 4.6 provides substrates or cover for animals
 - 4.6.1 nesting or breeding substrate (e.g., nesting material)
 - 4.6.2 thermal, hiding cover, loafing or den site
 - 4.6.3 provides microhabitat (as for invertebrates)
 - 4.6.3.1 aquatic or riparian environments
 - 4.6.3.2 terrestrial environments
 - 4.6.3.3 canopy environments
 - 4.6.3.4 tree bole environments
 - 4.6.4 creates "sap wells" in trees
- 4.7 nest parasite
 - 4.7.1 cowbird
 - 4.7.2 host for nest parasitism
- 4.8 primary cavity excavator in snags or live trees
- 4.9 primary burrow excavator (fossorial)
 - 4.9.1 creates large burrows (rabbit, badger size)
 - 4.9.2 creates small burrows (less than rabbit size)
- 4.10 competitor
- 4.11 uses burrows dug by other species
- 4.12 secondary cavity nester
- 4.13 parasite (invertebrates)
- 5 Disease, pathogen, and parasite relationships
 - 5.1 carrier, transmitter, or reservoir of vertebrate diseases (including rabies)
 - 5.2 acts as pathogen or disease
 - 5.3 parasite carrier or transmitter
 - 5.4 carrier, transmitter, or reservoir of plant diseases (invertebrates)
 - 5.5 activity increases host susceptibility to plant diseases (invertebrates)
- 6 Soil relationships
 - 6.1 physically affects (improves) soil structure, aeration (typically by digging)
 - 6.2 aids general turnover of soil nutrients and layers
 - 6.3 aids N retention or uptake in soil
 - 6.4 aids soil stabilization
 - 6.5 aids rock weathering
 - 6.6 detoxifies xenobiotics (invertebrates)
 - 6.7 metal accumulator (sequesters heavy metals)
 - 6.8 soil (invertebrate) organisms which influence rate or trajectory of vegetation succession and presence of plant species
- 7 Wood relationships
 - 7.1 physically breaks down wood
 - 7.1.1 large logs
 - 7.1.2 smaller wood pieces
 - 7.2 chemically breaks down wood
- 8 Water relationships
 - 8.1 impounds water (e.g., beavers)

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- 8.2 bioindicator of water quality
- 8.3 hydrologic buffer
- 8.4 improves water quality
- 8.5 contributes to short-term increase in stream flow (invertebrates)
- 9 Weather, climate, insolation relationships
 - 9.1 affects albedo (as of soil, rock, or soil)
- 10 Vegetation structure and composition relationships
 - 10.1 creates canopy gap openings (tree death) (invertebrates)
 - 10.2 creates standing dead trees (snags) (invertebrates)

APPENDIX 4

Geographic Area or Habitat

Valid codes

Inverts

Geoarhab

342 CE AGRICULTURAL
342 DB ID FES, BLBNCHWHTGRS M242CC PPINE
342CE AGRICULTURAL LAND USE
342CG WYOMING BIG SAGEBRUSH
342HC P-PINE GRASSLAND
342I COL.BAS; M333AR INTER. P-PINE
342I COLUMBIA BASIN/SRM 110
342IA PINYON-JUNIPER WOODLANDS
342IA PONDEROSA PINE-SHRUBLAND
342ID AGRICULTURAL LAND USE
342ID WATER (?)
ALL CRB, ESP. N. GREAT BASIN DESERT
ALL PORTIONS OF CRB
ALL SOIL TYPES/ALL ECOCSYSTEMS, ETC.
ALL SOIL TYPES/ALL ELEVATION,ASPECTS
ALPINE TUNDRA-CRB005
ARTEMISIA/PURSHIA SHRUB TYPE
ASPEN
BAILEY'S M333D
BAILEY'S 331A
BAILEY'S 342H
BAILEY'S M242C
BAILEY'S M261D
BAILEY'S M261G
BAILEY'S M331A
BAILEY'S M331D
BAILEY'S M332A
BAILEY'S M332B
BAILEY'S M332E
BAILEY'S M332F
BAILEY'S M332G
BAILEY'S M333A
BAILEY'S M333B
BAILEY'S M333C
BAILEY'S M333D
BAILEY'S M342B
BAILEY'S M342C

BAILEY'S M342D
BAILEY'S M342H
BAILEY'S M342I
BIG LOST
BIOTIC CRUSTS ON SURFACE OF SOIL
BIRCH, LOWER BOISE, BIG LOST, HANGMAN
BLUE MTNS; NORTHERN ROCKIES
CASCADE MTNS/MT. HOOD TO 3 SISTERS AREA
COLD STEPPE/SAGEBRUSH
COLUMBIA & SNAKE RIVERS
COLUMBIA BASIN - UNDISTURBED SANDY BEACH
COLUMBIA BASIN W/SHRUB-STEPPE GOOD COND.
COTTONWOOD/WILLOW
CRB
CRB SHRUB STEPPE/HERB
CRB STEPPE SHRUB AND GRASSLANDS
DIFRT. SPP OCCUR IN PARTICULAR HABITATS
EASTER OREGON AND WASHINGTON TO IDAHO
EASTER OREGON, WASHINGTON, IDAHO
EASTERN OREGON AND WASHINGTON
ENTIRE CRB
ENTIRE CRB - EXCEPT GREAT BASIN
FORESTED AREAS NORTH/SOUTH ID, OR, WA
GREATER CRB??
IDAHO, EASTERN OREGON AND WASHINGTON
INTERIOR DOUGLAS FIR
INTERIOR P. PINE, LODGEPOLE PINE
INTERIOR P.PINE AND LODGEPOLE PINE
INTERIOR PONDEROSA PINE, LODGEPOLE PINE
INTERIOR PONDEROSA PINE/PINUS CONTORIA
JUNIPER ZONE
JUNIPER ZONE CRB
LAVA TUBE CAVES ON MT. ADAMS RANGER DIS.
LODGEPOLE PINE
LODGEPOLE PINE ZONE
LOW. CLARK/LOW. BOISE/MID. SALMON/BIRCH
LOWER BOISE/BIRCH/HENRYS/BITTERROOT/SALM
LOWER CLARK FORK/MIDDLE SALMON/PALOUSE
LOWER FORK, PORTNEUF, BIG LOST
LOWER SNAKE RIVER CANYON, WA.
M242C, 342IC AGRICULTURAL USE LAND
M242CE, M261DH, M242CG
M261GA; M332GK, M332GA,331AB,331AC,331AF
M331AG P-PINE GRASSLAND; M332GD GRS/AG/S
M331D GRAND TETON NATIONAL PARK

M331DP IDAHO FESCUE-SLENDER WHEATGRASS
M332ARR INT PPINE, M332GA IDFES, PPINGRS
M332FA CRATERS OF THE MOOD NAT. MON.
M332G BLUE MTNS; 342B NW BASIN AND RANGE
M332GA MIXED GRASS-AG-SHRUBLAND
M332GI,331AC,342IC,331AB,M332GG,M332GO
M333AE,M242CC,M242CE,331AC,M332GI,331AB
MIDDLE COLUMBIA HOOD
MIDDLE COLUMBIA HOOD & LOWER CROOKED
MIXED CONIFER
MIXED CONIFER & WESTERN LARCH
MIXED GRASS, SHRUBLAND-CRB002
NATIVE PERENNIAL HERB STAGE
NO RESTRICTIONS KNOWN
NODULES IN ROOT SYSTEMS OF LEGUMES
NORTHWESTERN OREGON
NOT FOUND IN RANGELAND STRUCTURAL STAGES
OPEN SHRUB STEPPE - XERIC SITES
PALOUSE, PORTENUF
PALOUSE/LOW. SNAKE-TUCANNON/UP. YAKIMA
PINUS PONDEROSA
PINUS CONTORTA AND PINUS PONDEROSA
PINUS CONTORTA/P. PONDEROSA ZONES
PINUS CONTORTA/PINUS PONDEROSA ZONE
PONDEROSA PINE/LODGEPOLE PINE
PORTNEUF/BIG LOST/HANGMAN/PALOUSE/HENRYS
RANGE OF PINUS CONTORTA/P. PONDEROSA
RANGELAND AREAS IN ID, EASTERN OR & WA
RIPARIAN
RIPARIAN, LARGE RIVERS/COBBLE
RIPARIAN, RIVER BOTTOM.
RIPARIAN/INTERIOR DOUGLAS-FIR ZONE
RIPARIAN/SALINE WATERS
RIPARIAN/SALIX
RIPARIAN/TREES (SALIX)
SAF 206/SAF 210/SAF 213/SAF 237
SAF 206/SAF 213/SAF 226
SAF 206/SAF 218
SAF 207/SAF 205/SAF 211/SAF 213
SAF 208/SAF 212/SAF 215/SAF 218/SAF 237
SAF 215/SAF 237
SEE FORM FOR LISTING
SEE PANEL SPECIES FORM FOR LISTING
SEE PANEL SPECIES INFO. FORM FOR LISTING
SERAL SHRUBLAND-CRB003

SHRUB LAYER
SHRUB LAYER/STEPPE
SHRUB STEPPE
SHRUB STEPPE (SAGEBRUSH)
SHRUB STEPPE/HOT SPRING
SHRUB-STEPPE; OCCASIONALLY ARID FOREST
SHRUB/GRASS STEPPE
SHRUB/GRASSLANDS
SHRUB/STEPPE
SHRUB/STEPPE HOT SPRINGS
SHRUB/STEPPE--THERMAL WATERS
SHRUB/STEPPE-ALKALINE RIPARIAN ZONE
SHRUB/STEPPE-GRASS
SHRUB/STEPPE/CONIFERS
SNAKE HEADWATERS
SOUTHERN IDAHO
SOUTHERN IDAHO & OREGON/NW NEVADA
SOUTHERN IDAHO AND WYOMING
STEPPE SHRUB/HERB STAGE
STEPPE/SHRUB
STEPPE/SHRUB FORB
SUBALPINE HERBACEOUS
SUBALPINE HERBACEOUS-CRB004
SUBALPINE HERBACEOUS-CRB004
SW MT.
TERRESTRIAL BELOW GROUND DESERT SHRUB.
THROUGHOUT FORESTED ALONG COLUMBIA RIVER
UNDERSTORY
UNDERSTORY HERB/FORB//SHRUB LAYER
UNDERSTORY/HERB AND FORB
UNDERSTORY/HERBS AND FORBS
UPPER HENRYS, BIGWOOD
WA/OR CASCADES/BLUE MTNS. (OLD GROWTH)
WALLOWA
WEST. WASH./WEST. ORE./NW. CALIF.
WESTERN LARCH
WESTERN MONTANA AND WYOMING

Verts

Geoarhab

ALL CRB EAST OF CASCADES
ANALYSIS
ANALYSIS AREA

BASINWIDE
BASINWIDE, BREEDING HABITAT
BASINWIDE, LOW ELEVATION
BASINWIDE, WITHIN SPECIES RANGE
CRB
E.OR, CA, NV, UT, & SOUTH
EASTERN FOOTHILLS CASCADES/TARGRA
INTERMOUNTAIN WEST
NW MONTANA ONLY (& BC, ALB)
OREGON CASCADES
PINYON JUNIPER
SOUTHEAST IDAHO

Plants

Georhab

ALL BUT COLUMBIA BASIN AND BASIN AND RAN
BASIN AND RANGE
BLUE MT
COLUMBIA BASIN
CRB WIDE
EAST CASCADES NORTH
EAST CASCADES SOUTH
MONTANA
NEVADA
NORTHERN IDAHO
OKANOGAN HIGHLANDS
SOUTHERN IDAHO
WYOMING

APPENDIX 5

CRB - Cover types and associated structural stages

VegId	VegCode	VegDesc	StructId	StructCode	StructDesc
1	CRB003	Shrub or Herb/Tree Regen	22	Ch	Closed Herbland
1	CRB003	Shrub or Herb/Tree Regen	24	Olms	Open Low Shrub
1	CRB003	Shrub or Herb/Tree Regen	26	Clms	Closed Mid Shrub
1	CRB003	Shrub or Herb/Tree Regen	27	Ots	Open Tall Shrub
2	CRB005	Alpine Tundra	23	Clms	Closed Low Shrub
2	CRB005	Alpine Tundra	24	Olms	Open Low Shrub
3	CRB006	Barren	35		Rock
4	CRB007	Herbaceous Wetlands	21	Oh	Open Herbland
4	CRB007	Herbaceous Wetlands	22	Ch	Closed Herbland
5	CRB008	Pacific Silver Fir/Mt Hemlock	1	Si	Stand Initiation Forest
5	CRB008	Pacific Silver Fir/Mt Hemlock	3	Sec	Stem Exclusion Closed Canopy Forest
5	CRB008	Pacific Silver Fir/Mt Hemlock	4	Ur	Understory Reintiation Forest
5	CRB008	Pacific Silver Fir/Mt Hemlock	5	Yf	Young Multi-strata Forest
5	CRB008	Pacific Silver Fir/Mt Hemlock	6	Ofm	Old Multi-strata Forest
6	CRBS01	Juniper Woodlands	11	Wdl	Stand Initiation Woodland
6	CRBS01	Juniper Woodlands	13	Wdl	Understory Reintiation Woodland
6	CRBS01	Juniper Woodlands	14	Wdl	Young Multi-strata Woodland
6	CRBS01	Juniper Woodlands	15	Wdl	Old Multi-strata Woodland
6	CRBS01	Juniper Woodlands	16	Wdl	Old Single-strata Woodland
7	CRBS02	Mixed Conifer Woodlands	11	Wdl	Stand Initiation Woodland
7	CRBS02	Mixed Conifer Woodlands	12	Wdl	Stem Exclusion Woodland
7	CRBS02	Mixed Conifer Woodlands	13	Wdl	Understory Reintiation Woodland
7	CRBS02	Mixed Conifer Woodlands	14	Wdl	Young Multi-strata Woodland
7	CRBS02	Mixed Conifer Woodlands	15	Wdl	Old Multi-strata Woodland
8	CRBS03	Juniper / Sagebrush	11	Wdl	Stand Initiation Woodland
8	CRBS03	Juniper / Sagebrush	13	Wdl	Understory Reintiation Woodland
8	CRBS03	Juniper / Sagebrush	14	Wdl	Young Multi-strata Woodland
8	CRBS03	Juniper / Sagebrush	16	Wdl	Old Single-strata Woodland
9	CRBS05	Shrub Wetlands	23	Clms	Closed Low Shrub
9	CRBS05	Shrub Wetlands	24	Olms	Open Low Shrub
9	CRBS05	Shrub Wetlands	25	Olms	Open Mid Shrub

9	CRBS05	Shrub Wetlands	26	Clms	Closed Mid Shrub
9	CRBS05	Shrub Wetlands	28	Ctss	Closed Tall Shrub
10	CRBS06	Agropyron Bunchgrass	22	Ch	Closed Herbland
11	CRBS07	Native Forb	21	Oh	Open Herbland
11	CRBS07	Native Forb	22	Ch	Closed Herbland
12	CRBS08	Exotic Forbs / Annual Grass	21	Oh	Open Herbland
12	CRBS08	Exotic Forbs / Annual Grass	22	Ch	Closed Herbland
13	CRBS09	Grand Fir/White Fir	1	Si	Stand Initiation Forest
13	CRBS09	Grand Fir/White Fir	3	Sec	Stem Exclusion Closed Canopy Forest
13	CRBS09	Grand Fir/White Fir	4	Ur	Understory Reintiation Forest
13	CRBS09	Grand Fir/White Fir	5	Yf	Young Multi-strata Forest
13	CRBS09	Grand Fir/White Fir	6	Ofm	Old Multi-strata Forest
13	CRBS09	Grand Fir/White Fir	7	Ofs	Old Single-strata Forest
14	CRBS10	White Bark Pine / Alpine Larch	1	Si	Stand Initiation Forest
14	CRBS10	White Bark Pine / Alpine Larch	2	Seo	Stem Exclusion Open Canopy Forest
14	CRBS10	White Bark Pine / Alpine Larch	4	Ur	Understory Reintiation Forest
14	CRBS10	White Bark Pine / Alpine Larch	5	Yf	Young Multi-strata Forest
14	CRBS10	White Bark Pine / Alpine Larch	6	Ofm	Old Multi-strata Forest
15	CRBS11	Red Fir	1	Si	Stand Initiation Forest
15	CRBS11	Red Fir	3	Sec	Stem Exclusion Closed Canopy Forest
15	CRBS11	Red Fir	4	Ur	Understory Reintiation Forest
15	CRBS11	Red Fir	5	Yf	Young Multi-strata Forest
15	CRBS11	Red Fir	6	Ofm	Old Multi-strata Forest
18	CRBS19	Urban	33		Urban
19	CRBS20	Water	34		Water
20	SAF205	Mt Hemlock	1	Si	Stand Initiation Forest
20	SAF205	Mt Hemlock	3	Sec	Stem Exclusion Closed Canopy Forest
20	SAF205	Mt Hemlock	4	Ur	Understory Reintiation Forest
20	SAF205	Mt Hemlock	5	Yf	Young Multi-strata Forest
20	SAF205	Mt Hemlock	6	Ofm	Old Multi-strata Forest
20	SAF205	Mt Hemlock	7	Ofs	Old Single-strata Forest
21	SAF206	Engelmann Spruce/Subalpine Fir	1	Si	Stand Initiation Forest
21	SAF206	Engelmann Spruce/Subalpine Fir	3	Sec	Stem Exclusion Closed Canopy Forest
21	SAF206	Engelmann Spruce/Subalpine Fir	4	Ur	Understory Reintiation Forest
21	SAF206	Engelmann Spruce/Subalpine Fir	6	Ofm	Old Multi-strata Forest

22	SAF208	Whitebark Pine	1	Si	Stand Initiation Forest
22	SAF208	Whitebark Pine	3	Sec	Stem Exclusion Closed Canopy Forest
22	SAF208	Whitebark Pine	4	Ur	Understory Reinitiation Forest
22	SAF208	Whitebark Pine	5	Yf	Young Multi-strata Forest
22	SAF208	Whitebark Pine	6	Ofm	Old Multi-strata Forest
22	SAF208	Whitebark Pine	7	Ofs	Old Single-strata Forest
23	SAF210	Interior Douglas-fir	1	Si	Stand Initiation Forest
23	SAF210	Interior Douglas-fir	3	Sec	Stem Exclusion Closed Canopy Forest
23	SAF210	Interior Douglas-fir	4	Ur	Understory Reinitiation Forest
23	SAF210	Interior Douglas-fir	5	Yf	Young Multi-strata Forest
23	SAF210	Interior Douglas-fir	6	Ofm	Old Multi-strata Forest
23	SAF210	Interior Douglas-fir	7	Ofs	Old Single-strata Forest
24	SAF212	Western Larch	1	Si	Stand Initiation Forest
24	SAF212	Western Larch	3	Sec	Stem Exclusion Closed Canopy Forest
24	SAF212	Western Larch	4	Ur	Understory Reinitiation Forest
24	SAF212	Western Larch	5	Yf	Young Multi-strata Forest
24	SAF212	Western Larch	6	Ofm	Old Multi-strata Forest
24	SAF212	Western Larch	7	Ofs	Old Single-strata Forest
25	SAF215	Western White Pine	1	Si	Stand Initiation Forest
25	SAF215	Western White Pine	3	Sec	Stem Exclusion Closed Canopy Forest
25	SAF215	Western White Pine	4	Ur	Understory Reinitiation Forest
25	SAF215	Western White Pine	5	Yf	Young Multi-strata Forest
25	SAF215	Western White Pine	6	Ofm	Old Multi-strata Forest
25	SAF215	Western White Pine	7	Ofs	Old Single-strata Forest
26	SAF217	Aspen	1	Si	Stand Initiation Forest
26	SAF217	Aspen	3	Sec	Stem Exclusion Closed Canopy Forest
26	SAF217	Aspen	4	Ur	Understory Reinitiation Forest
26	SAF217	Aspen	5	Yf	Young Multi-strata Forest
27	SAF218	Lodgepole Pine	1	Si	Stand Initiation Forest
27	SAF218	Lodgepole Pine	3	Sec	Stem Exclusion Closed Canopy Forest
27	SAF218	Lodgepole Pine	4	Ur	Understory Reinitiation Forest
27	SAF218	Lodgepole Pine	5	Yf	Young Multi-strata Forest
27	SAF218	Lodgepole Pine	6	Ofm	Old Multi-strata Forest
27	SAF218	Lodgepole Pine	7	Ofs	Old Single-strata Forest
28	SAF219	Limber Pine	1	Si	Stand Initiation Forest

28	SAF219	Limber Pine	2	Seo	Stem Exclusion Open Canopy Forest
28	SAF219	Limber Pine	4	Ur	Understory Reintiation Forest
28	SAF219	Limber Pine	6	Ofm	Old Multi-strata Forest
29	SAF227	Western Redcedar/Western Hemlock	1	Si	Stand Initiation Forest
29	SAF227	Western Redcedar/Western Hemlock	3	Sec	Stem Exclusion Closed Canopy Forest
29	SAF227	Western Redcedar/Western Hemlock	4	Ur	Understory Reintiation Forest
29	SAF227	Western Redcedar/Western Hemlock	5	Yf	Young Multi-strata Forest
29	SAF227	Western Redcedar/Western Hemlock	6	Ofm	Old Multi-strata Forest
29	SAF227	Western Redcedar/Western Hemlock	7	Ofs	Old Single-strata Forest
30	SAF233	Oregon White Oak	11	Wdl	Stand Initiation Woodland
30	SAF233	Oregon White Oak	13	Wdl	Understory Reintiation Woodland
30	SAF233	Oregon White Oak	14	Wdl	Young Multi-strata Woodland
30	SAF233	Oregon White Oak	15	Wdl	Old Multi-strata Woodland
30	SAF233	Oregon White Oak	16	Wdl	Old Single-strata Woodland
31	SAF235	Cottonwood/Willow	1	Si	Stand Initiation Forest
31	SAF235	Cottonwood/Willow	3	Sec	Stem Exclusion Closed Canopy Forest
31	SAF235	Cottonwood/Willow	4	Ur	Understory Reintiation Forest
31	SAF235	Cottonwood/Willow	5	Yf	Young Multi-strata Forest
31	SAF235	Cottonwood/Willow	6	Ofm	Old Multi-strata Forest
32	SAF237	Interior Ponderosa Pine	1	Si	Stand Initiation Forest
32	SAF237	Interior Ponderosa Pine	2	Seo	Stem Exclusion Open Canopy Forest
32	SAF237	Interior Ponderosa Pine	3	Sec	Stem Exclusion Closed Canopy Forest
32	SAF237	Interior Ponderosa Pine	4	Ur	Understory Reintiation Forest
32	SAF237	Interior Ponderosa Pine	5	Yf	Young Multi-strata Forest
32	SAF237	Interior Ponderosa Pine	6	Ofm	Old Multi-strata Forest
32	SAF237	Interior Ponderosa Pine	7	Ofs	Old Single-strata Forest
33	SAF243	Sierra Nevada Mixed Conifer	1	Si	Stand Initiation Forest
33	SAF243	Sierra Nevada Mixed Conifer	3	Sec	Stem Exclusion Closed Canopy Forest
33	SAF243	Sierra Nevada Mixed Conifer	4	Ur	Understory Reintiation Forest
33	SAF243	Sierra Nevada Mixed Conifer	5	Yf	Young Multi-strata Forest
33	SAF243	Sierra Nevada Mixed Conifer	6	Ofm	Old Multi-strata Forest
33	SAF243	Sierra Nevada Mixed Conifer	7	Ofs	Old Single-strata Forest
34	SAF245	Pacific Ponderosa Pine	1	Si	Stand Initiation Forest
34	SAF245	Pacific Ponderosa Pine	3	Sec	Stem Exclusion Closed Canopy Forest
34	SAF245	Pacific Ponderosa Pine	4	Ur	Understory Reintiation Forest

34	SAF245	Pacific Ponderosa Pine	5	Yf	Young Multi-strata Forest
34	SAF245	Pacific Ponderosa Pine	6	Ofm	Old Multi-strata Forest
34	SAF245	Pacific Ponderosa Pine	7	Ofs	Old Single-strata Forest
36	SRM104	Antelope Bitterbrush/Bluebunch Wheatgrass	23	Clms	Closed Low Shrub
39	SRM322	Mountain Mahogany	23	Clms	Closed Low Shrub
39	SRM322	Mountain Mahogany	25	Olms	Open Mid Shrub
41	SRM402	Mountain Big Sagebrush	23	Clms	Closed Low Shrub
41	SRM402	Mountain Big Sagebrush	25	Olms	Open Mid Shrub
41	SRM402	Mountain Big Sagebrush	26	Clms	Closed Mid Shrub
43	SRM406	Low Sage	23	Clms	Closed Low Shrub
43	SRM406	Low Sage	24	Olms	Open Low Shrub
44	SRM414	Salt Desert Shrub	23	Clms	Closed Low Shrub
44	SRM414	Salt Desert Shrub	24	Olms	Open Low Shrub
44	SRM414	Salt Desert Shrub	25	Olms	Open Mid Shrub
45	SRM421	Chokecherry/Serviceberry/Rose	23	Clms	Closed Low Shrub
45	SRM421	Chokecherry/Serviceberry/Rose	24	Olms	Open Low Shrub
45	SRM421	Chokecherry/Serviceberry/Rose	25	Olms	Open Mid Shrub
45	SRM421	Chokecherry/Serviceberry/Rose	27	Ots	Open Tall Shrub
48	CRBS12	Cropland / Hay / Pasture	22	Ch	Closed Herbland
48	CRBS12	Cropland / Hay / Pasture	31		Agricultural
49	CRBS13	Fescue-Bunchgrass	21	Oh	Open Herbland
49	CRBS13	Fescue-Bunchgrass	22	Ch	Closed Herbland
50	CRBS04	Big Sagebrush	22	Ch	Closed Herbland
50	CRBS04	Big Sagebrush	23	Clms	Closed Low Shrub
50	CRBS04	Big Sagebrush	24	Olms	Open Low Shrub
50	CRBS04	Big Sagebrush	25	Olms	Open Mid Shrub
50	CRBS04	Big Sagebrush	26	Clms	Closed Mid Shrub