RIPARIAN INVENTORY AND

PROPER FUNCTIONING CONDITION ASSESSMENT

OF THE

ROCKING M WILDLIFE CONSERVATION EASEMENT AREA

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SUMMARY

The Bureau of Land Management (BLM), Idaho Department of Fish and Game (IFG), and the Rocking M Ranch co-manage a large block of land in southern Hells Canyon, collectively referred to as the Rocking M Wildlife Conservation Easement Area. The BLM contracted the Idaho Department of Fish and Game's Conservation Data Center to conduct an ecological inventory and assessment of riparian areas along eight major streams on the Rocking M. We collected information on the riparian flora, riparian plant communities, and stream and hydrologic characteristics, as well as a Proper Functioning Condition (PFC) assessment, along 28 stream segments, totaling 32.5 miles.

The results of this work are reported in three formats: (1) Riparian Plant Community Types – riparian plant community descriptions for southwestern Idaho, including Rocking M sampling, are contained in a separate report; (2) Rocking M Field Forms – all field data forms, arranged by stream segment, are compiled in notebooks, which have been distributed to the BLM and IFG.; (3) Rocking M Summary Report – this report, which summarizes our floristic, riparian plant community, and stream and hydrologic sampling, as well as the Proper Functioning Condition assessment.

We observed 195 vascular plant species in the riparian zones of the Rocking M. This diverse flora contained 51(26%) non-native species and no rare species. We sampled 35 vegetation plots and identified ten riparian plant communities, all dominated by woody vegetation (shrubs or trees). Sixteen of the sampled stands were not classified for various reasons, ranging from being highly disturbed to lack of a classification for certain dominance types (e.g., aspen and tall shrubs). The creeks of the Rocking M are typical of streams found throughout Hells Canyons, that is, they are steep and straight. Most segments classify as Rosgen stream type A. Gradients are generally greater than 5%, with many over 10%, and they have low sinuosity. Some of the lower segments may classify as Rosgen stream type B, due to lower gradients and somewhat greater entrenchment and sinuosity. Gravel and cobbles dominate the stream channel material. The width of the riparian zone is narrow, generally less than 30 feet wide.

Thirty percent of the stream miles on the Rocking M are in PFC. The remaining stream segments are either Functional – At Risk (58%) or Nonfunctional (12%). Raft, Wolf, and Trail creeks are the drainages in the worst condition. Dennett Creek is the drainage in the best condition on the Rocking M. The reasons for Functional – At Risk and Nonfunctional ratings vary by drainage. The Dennett Creek drainage experienced a natural blowout in May 1998, and we rated the scoured segments as Functional – At Risk. Cattle grazing appeared to be the primary reason for low ratings in the other drainages.

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INTRODUCTION

The Bureau of Land Management (BLM), Idaho Department of Fish and Game (IFG), and the private Rocking M Ranch co-manage a large block of land along the west slope of the Hitt Mountains in southern Hells Canyon. This area of nearly 20,000 acres lies along Brownlee Reservoir and consists of a commingling of public lands managed by the BLM and private land on which IFG holds a conservation easement. The area is managed primarily for wildlife and wildlife habitats. Collectively, it is referred to as the Rocking M Wildlife Conservation Easement Area, although technically only the private lands are under the easement. In this report I refer to it simply as the Rocking M.

The BLM contracted the Idaho Department of Fish and Game's Conservation Data Center (CDC) to conduct an ecological inventory and assessment of riparian areas along eight major streams on the Rocking M. The results of this work are reported in three formats, as follows:

1. Riparian Plant Community Types – Riparian plant communities patterns of southwestern Idaho are the least known of anywhere in the state, in terms of classification of plant associations for management and biodiversity conservation purposes. A modest project began in 1997 to rectify this paucity of information. Funded by the BLM, we conducted a riparian community inventory of 14 reference areas in southwestern Idaho (Moseley 1998). It expanded during 1998 to include three different studies whose objectives included, at least in part, documentation and characterization of riparian and wetland vegetation: 1) a second year of inventory work in selected reference areas; 2) an ecological assessment of the 45 Ranch Allotment funded by The Nature Conservancy; and 3) a study of the stream and riparian conditions on the Rocking M. Knowledge gained through this larger project will contribute to the standardized classification system for Idaho plant communities maintained by the CDC (see Jankovsky-Jones et al. 1999 for an overview of the riparian portion of the classification). A report summarizing the results of our 1997 and 1998 work, entitled *Riparian and Wetland Communities in Southwestern Idaho: Second-year Inventory Results and Preliminary Catalog of Community Types*, was produced in January 1999 (Moseley 1999). This catalog should be consulted for descriptions of riparian communities documented on the Rocking M.

2. Rocking M Field Forms – We have compiled all field data forms into a notebook, copies of which have been distributed to the two primary management agencies, BLM Cascade Resource Area and IFG Andrus Wildlife Management Area. A copy is also on file at the CDC. For each stream segment inventoried, the notebook contains Administrative Information, Segment Description, Vegetation Summary, Stream and Hydrologic Information, PFC Standard Checklist, plant community plot forms, a topo map of the segment, and photographs. Certain data contained in these field forms is summarized in this report for the Rocking M as a whole. Refer to the notebook for more detailed information about each segment.

3. Rocking M Summary Report – This is it, a report summarizing our floristic, riparian plant community, and stream and hydrologic sampling, as well as the Proper Functioning Condition assessment.

METHODS

Floristic Sampling

Mancuso (1995) began a compilation of the vascular plant flora of the Rocking M during a vegetation mapping project. We built upon that list for species occurring in riparian areas using field observations and plot data. Nearly all the species were identified using technical floras, but only a few were vouchered with specimens that will be deposited in herbaria.

Proper Functioning Condition Assessment

Riparian communities on the Rocking M are all lotic systems, which is a broad hydrological class that includes running water. We used the Proper Functioning Condition (PFC) assessment methodology (Prichard 1995; 1998) to assess their ecological condition. We received PFC training from the BLM state office and applied it to our work on the Rocking M. We used the Standard Checklist (Lotic) developed by Erv Cowley for PFC assessments in Idaho (see Appendix 1 for an example).

Riparian Plant Community Sampling

As mentioned previously, sampling and characterization of riparian communities on the Rocking M took place in the context of a much larger, multi-year effort by the CDC to inventory diversity and distribution patterns of riparian communities in southwestern Idaho (Moseley 1998; 1999). The general methods for community sampling are fully explained in Moseley (1998) and examples of the plot forms we used are in Appendix 1.

For the Rocking M project, we used plots to characterize the composition and structure of the riparian vegetation along each stream segment for which a PFC assessment was conducted. Normally, one plot was used to characterize the dominant community type along a segment. Incidental types, which had minor cover, were noted on the inventory forms for that segment but the vegetation was not sampled. In some cases more than one plot was sampled along a segment if two or community types shared dominance.

Stream and Hydrologic Sampling

We collected hydrogeomorphic data for each stream segment to support the PFC assessment. An example of the forms used to collect stream and hydrologic information is in Appendix 1. The types of information we collected include characterization of the hydrologic regime, stream channel, and floodplain, as well as location and potential impacts of anthropogenic disturbances.

RESULTS

Our riparian inventory of the Rocking M took place between June 23 and July 30, 1998. Eight major streams were sampled, totaling 32.5 miles. Each stream was divided into shorter segments to accommodate the PFC assessment methodology (Prichard 1998). Twenty-eight segments were assessed on the Rocking M (Table 1). Please note that, with one exception, segment 01 is the highest segment in drainage. The exception is the "North Fork" Wolf Creek, where the 01 is the lowest. Our inventory results for riparian communities, stream and hydrologic characteristics, PFC assessments, and the riparian flora are summarized in the next four sections. Refer to the field form notebooks and riparian community summary (Moseley 1999) for more detailed information.

Riparian Flora

We observed 195 vascular plant species in the riparian zones of the Rocking M. At least in part, this diverse flora probably results from the broad elevational range encompassed by the Rocking M. Appendix 2 contains scientific and common names for the riparian species (see Moseley 1998 for nomenclatural information). No rare species were observed. Twenty-six percent (51 species) of the flora is non-native.

Riparian Plant Communities

We sampled 35 vegetation plots along the 28 creek segments on the Rocking M (Table 2). As mentioned in the Methods section, this plot information was used in a larger assessment of riparian community diversity in southwestern Idaho. Moseley (1999) is a summary of our two-year project. It contains the results of our sampling and characterizations of the communities we encountered, including information on distribution, identification, ecological and environmental characteristics, succession and management, and wildlife values.

Our results from the Rocking M sampling are summarized in Table 2. See the field form notebook for more detailed information about the distribution of riparian plant communities within the segments. I identified ten riparian plant communities on the Rocking M, derived from 24 of the 35 plots. Sixteen plots were not used for the following reasons:

- Aspen – I was not able to classify the six aspen plots, each containing a diverse mixture of tall shrubs in the understory. More aspen plots are needed in southwestern Idaho to better understand community diversity patterns and develop a useful classification.
- Arroyo willow – Two of the four arroyo willow plots were highly disturbed and not classified.
- Tall shrubs – Three plots containing a mixture of tall shrubs were not classified. More plots are needed to develop a useful classification.
- Weedy herbaceous – Five plots from highly disturbed stands were dominated by weedy herbaceous species. Community types were not identified.

Table 1. Drainages inventoried on the Rocking M during 1998, arranged from north to south.

Drainage	Segment Code	Length (miles)
Raft Creek (total length 4.4 miles)	RAFT01	1.7
	RAFT02	1.7
	RAFT03	1.0
North Fork Dennett Creek (total length 3.3 miles)	NDEN01	1.0
	NDEN02	1.0
	NDEN03	0.3
	NDEN04	1.0
Middle Fork Dennett Creek (total length 1.8 miles)	MDEN01	0.7
	MDEN02	1.1
Dennett Creek (total length 4.2 miles)	DENN01	0.9
	DENN02	1.1
	DENN03	1.8
	DENN04	0.4
"North Fork" Wolf Creek (total length 1.3 miles)	NFWO01	0.3
	NFWO02	1.0
Wolf Creek (total length 7.6 miles)	WOLF01	1.0
	WOLF02	1.8
	WOLF03	2.4
	WOLF04	1.1
	WOLF05	0.6
	WOLF06	0.7
Trail Creek (total length 7.1 miles)	TRAI01	1.0
	TRAI02	0.7
	TRAI03	0.3
	TRAI04	0.3
	TRAI05	1.6
	TRAI06	3.2
Rock Creek	ROCK01	2.8

Table 2. Riparian plant communities of the Rocking M.

Alliance	Community	Plot Number	Seral Status	Human Induced
FORESTED				
Alnus rhombifolia	*Alnus rhombifolia/Philadelphus lewisii*	Id Power	Late	N
		ROCK01A	?	N
		ROCK01B	?	N
Populus tremuloides	unclassified stands - tall shrub understories	NDEN01A	mid to late	N
		MDEN01A	mid to late	N
		NFWO02A	late	N
		DENN02A	late	N
		WOLF01B	mid to late	N
		RAFT01A	mid to late	N
Populus trichocarpa	*Populus trichocarpa/Acer glabrum*	DENN02B	late	N
	Populus trichocarpa/Rosa woodsii	NDEN04A	mid	N
		DENN03B	mid to late	N
		WOLF04A	late	N
Pseudotsuga menziesii	*Pseudotsuga menziesii /Acer glabrum-Physocarpus malvaceus* Floodplain	WOLF01A	late	N
WOODLANDS				
Juniperus occidentalis	*Juniperus occidentalis /Elymus glaucus*	DENN01B	mid	N
TALL SHRUB				
Betula occidentalis	*Betula occidentalis* /Mesic forb	MDEN02A	late	N
Crataegus douglasii	*Crataegus douglasii/Rosa woodsii*	RAFT01B	mid	Y?
		TRAI01A	early	Y?
		TRAI04A	early - mid	Y?
		TRAI05A	mid?	Y?

Alliance	Community	Plot Number	Seral Status	Human Induced
Salix lasiolepis	*Salix lasiolepis* /Bench	ROCK01C	?	Y
	Salix lasiolepis /Mesic Graminoid	TRAI02A	early - mid	Y?
		TRAI06A	?	?
	unclassified early seral stands	WOLF03A	early	Y
		WOLF05A	early	Y
Salix lutea	*Salix lutea/Poa pratensis*	DENN03A	mid	Y
		WOLF06A	early	Y
Tall Shrubs	unclassified tall shrub associations	RAFT01C	mid	Y?
		NDEN02A	late	N
		DENN01A	late	N
HERBACEOUS				
Weedy Herbaceous	*Poa pratensis*	NDEN03A	early	Y
	Poa pratensis	WOLF02A	early	Y
	mixed herbaceous (with 20% shrubs)	RAFT03A	early	Y
	mixed herbaceous	RAFT02A	early	Y
	mixed herbaceous	NFWO01A	early	Y

Streams and Hydrology

The creeks that traverse the Rocking M are typical of smaller streams found throughout Hells Canyons, that is, they are steep and straight. Elevations on the Rocking M range from 6500 feet along the crest of the Hitt Mountains to 2100 on Brownlee Reservoir. Creeks span this 4400 feet of elevation in just four to five miles of horizontal distance. Most segments, especially at the headwaters are classified as Rosgen stream type A, being steep, narrow, and straight (Rosgen 1996). Gradients are generally greater than 5%, with many over 10% (the record is 19%!), and they have low sinuosity. Some of the lower segments are less than 5% slope, are somewhat more entrenched, and have slightly greater sinuosity. These may be classified as Rosgen stream type B, but just barely. Gravel and cobbles dominate the stream channel material. The width of the riparian zone is narrow, generally less than 30 feet wide; floodplain width is often half that. Steep canyon slopes border the valley bottom, often rising directly out of the riparian zone. There is very little terrace development along the creeks.

Because of the steep nature of the terrain, including both the stream gradients and especially the canyon slopes, blowouts and debris flows are not uncommon. In fact, the white alder gallery forests at the mouth of Rock and Dennett creeks require these type of flow events for their establishment and maintenance (Miller 1976; Miller and Johnson 1976). This is probably why white alder is a common community dominant throughout Hells Canyon. One such event took place in the Dennett Creek drainage during late May or early June 1998. A rotational slide was triggered during a severe rainstorm high in the headwaters of the Middle Fork. It happened in what appeared to be a high quality bluebunch wheatgrass community on a very steep slope. The slide cut a gully into the slope down to bedrock for about 400 vertical feet. The debris torrent hit the creek and proceeded to scour the stream channel all the way down the Middle Fork, North Fork, and main Dennett Creek, depositing an alluvial fan in Brownlee Reservoir, about 5.7 miles from the source. This resulted in deep downcutting throughout most segments. Surprisingly, the woody vegetation that dominates these segments was not undercut much. The extensive root masses of such species as aspen, syringa, water birch, thinleaf alder, and white alder held them in place as the channel downcut next to them. Active downcutting appeared to cease soon after the debris flow.

Proper Functioning Condition Assessment

Tables 3 and 4 summarize our Proper Functioning Condition assessment for the Rocking M. Thirty percent of the stream miles on the Rocking M are in PFC. The headwater segments of North Fork Dennett, main Dennett, and North Fork Wolf creeks are in PFC, as well as the Rock Creek segment. The remaining stream segments are either Functional – At Risk (58%) or Nonfunctional (12%). Raft, Wolf, and Trail creeks are the drainages in the worst condition, with Trail and Raft creeks containing the only segments rated as Nonfunctional. There are no segments along these three creeks in PFC. For the most part, Dennett Creek is the drainage in the best condition on the Rocking M.

The reasons for Functional – At Risk and Nonfunctional ratings vary by drainage. We rated all but one of the segments affected by the Dennett Creek blowout as Functional – At Risk. These segments include Middle Fork Dennett 01 and 02, North Fork Dennett 04, and main Dennett 04, totaling 3.2 miles. The blowout appeared to be a natural, albeit episodic, event. Most of the woody riparian vegetation survived the debris flow and stream downcutting appeared to be stabilizing soon after the event.

Cattle grazing appears to be the primary reason that the remaining segments are either Functional – At Risk or Nonfunctional.

Table 3. 1998 functioning ratings for stream segments on the Rocking M. Rating abbreviations: PFC = Proper Functioning Condition; FAR = Functional – At Risk; NF = Nonfunctional.

Drainage	**Segment**	**PFC Rating**
Raft Creek	RAFT01	FAR
	RAFT02	NF
	RAFT03	NF
North Fork Dennett Creek	NDEN01	PFC
	NDEN02	PFC
	NDEN03	FAR
	NDEN04	FAR
Middle Fork Dennett Creek	MDEN01	FAR
	MDEN02	FAR
Dennett Creek	DENN01	PFC
	DENN02	PFC
	DENN03	PFC
	DENN04	FAR
"North Fork" Wolf Creek	NFWO01	FAR
	NFWO02	PFC
Wolf Creek	WOLF01	FAR
	WOLF02	FAR
	WOLF03	FAR
	WOLF04	FAR
	WOLF05	FAR
	WOLF06	FAR
Trail Creek	TRAI01	NF
	TRAI02	FAR
	TRAI03	NF
	TRAI04	FAR
	TRAI05	FAR
	TRAI06	FAR
Rock Creek	ROCK01	PFC

Table 4. Summary of 1998 functioning ratings on the Rocking M by stream miles.

Functioning Rating	**Steam Miles (# of segments)**	**Percent of Rocking M**
Proper Functioning Condition	9.6 (7)	30
Functional – At Risk	18.9 (17)	58
Nonfunctional	4.0 (4)	12
Total	32.5	100

REFERENCES

Jankovsky-Jones, M., S.K. Rust, and R.K. Moseley. 1999. Riparian reference areas in Idaho: A catalog of plant associations and conservation sites. General Technical Report RMRS-GTR-20. Rocky Mountain Research Station, Forest Service ,USDA, Ogden, UT. 141 p.

Mancuso, M. 1995. A vegetation map of the Rocking M Ranch, Upper Dennett Creek/Raft Creek Wildlife Conservation Easement Area, Washington County, Idaho. Prepared for the Idaho Department of Fish and Game, Boise, ID. 38 p., plus appendices.

Miller, T.B. 1976. Ecology of riparian communities dominated by white alder in western Idaho. Unpublished M.S. Thesis. University of Idaho, Moscow, ID. 154 p.

Miller, T.B., and F.D. Johnson. 1976. Ecology of riparian communities dominated by white alder in western Idaho. Pages 111-123 *in* Proceedings of the Symposium on Terrestrial and Aquatic Ecological Studies in the Northwest. Eastern Washington State College, Cheney, WA.

Moseley, R.K. 1998. Riparian and wetland community inventory of 14 reference areas in southwestern Idaho. Technical Bulletin No. 98-5. Idaho State Office, Bureau of Land Management, Boise, ID. 52 p., plus appendices.

Moseley, R.K. 1999. Riparian and wetland communities in southwestern Idaho: Second-year inventory results and preliminary catalog of community types. Unpublished report on file at the Conservation Data Center, Idaho Department of Fish and Game, Boise, ID 56 p., plus appendices.

Prichard, D., work group leader. 1995. Riparian area management: Process for assessing proper functioning condition. Technical Reference 1737-9. Bureau of Land Management, USDI, Denver, CO. 51 p.

Prichard, D., work group leader. 1998. Riparian area management: A users guide to assess proper functioning condition and supporting science for lotic areas. Draft. Technical Reference 1737-15. Bureau of Land Management, USDI, Denver, CO. 130 p.

Rosgen, D. 1996. Applied river morphology. Wildland Hydrology, Pagosa Springs, CO. 352 p.

Appendix 1

Field Forms Used on the Rocking M in 1998

1. Proper Functioning Condition Standard Checklist (Lotic).
2. Plant Community Plot Forms: Form II – General Plot Data; Form III – Ocular Plant Species Data.
3. Riparian Inventory Field Form.
4. Stream and Hydrologic Information.

Appendix 2

Riparian vascular plants of the Rocking M

SCIENTIFIC NAME	COMMON NAME
Aceraceae	**Maple family**
Acer glabrum	Rocky Mountain maple
Amaranthaceae	**Amaranth family**
***Amaranthus albus*	prostrate pigweed
***Amaranthus retroflexus*	redroot amaranth
Anacardiaceae	**Sumac family**
Rhus glabra	smooth sumac
Toxicodendron rydbergii	poison ivy
Apiaceae	**Parsley family**
Angelica arguta	sharptooth angelica
***Anthriscus scandicina*	chervil
***Conium maculatum*	poison-hemlock
Lomatium dissectum multifidum	fern-leaved desert-parsley
Osmorhiza chilensis	mountain sweet-cicely
Asclepiadaceae	**Milkweed family**
Asclepias speciosa	showy milkweed
Asteraceae	**Aster family**
Achillea millefolium	common yarrow
Agoseris grandiflora	large-flowered agoseris
***Arctium minus*	burdock
Arnica cordifolia	heart-leaved arnica
Arnica sororia	twin arnica
***Artemisia biennis*	biennial wormwood
Artemisia dracunculus	dragon sagewort
Artemisia ludoviciana	Louisiana mugwort
Artemisai rigida	stiff sagebrush
Artemisia tridentata tridentata	basin big sagebrush
Artemisia tridentata vaseyana	mountain big sagebrush
Aster sp.	aster
Bidens frondosa	leafy beggar-ticks
Chrysothamnus viscidiflorus	green rabbitbrush
***Cirsium arvense*	Canada thistle
***Cirsium vulgare*	bull thistle
Crepis sp.	hawksbeard
Euthamia occidentale	western goldenrod
Gnaphalium palustre	lowland cudweed
Grindelia squarrosa	curly-gup gumweed
Helianthus annuus	common sunflower
***Lactuca serriola*	prickly lettuce
***Onopordum acanthium*	Scotch thistle

Senecio integerrimus	western groundsel
Senecio serra	tall butterweed
Solidago canadensis	Canada goldenrod
Solidago gigantea	smooth goldenrod
***Sonchus asper*	prickly sow-thistle
***Taraxacum officinale*	common dandelion
***Tragopogon dubius*	yellow salsify
Xanthium strumarium	common cocklebur
Betulaceae	**Birch family**
Alnus incana	thinleaf alder
Alnus rhombifolia	white alder
Betula occidentalis	water birch
Boraginaceae	**Borage family**
Amsinckia retrorsa	rigid fiddleneck
***Asperugo procumbens*	madwort
Lithospermum arvense	corn gromwell
Mertensia ciliata	streamside bluebell
Brassicaceae	**Mustard family**
***Alyssum desertorum*	desert alyssum
Arabis glabra	towermustard
Arabis hirsuta	hairy rockcress
Descurania pinnata	western tansymustard
Descurania richardsonii	tansymustard
Erysium asperum	rough wallflower
***Lepidium latifolium*	broad-leaved peppergrass
***Rorippa nasturium-aquaticum*	water-cress
Rorippa sp.	cress
***Sisymbrium altissimum*	tumbling mustard
Caprifoliaceae	**Honeysuckle family**
Sambucus cerulea	blue elderberry
Symphoricarpos albus	common snowberry
Symphoricarpos oreophilus	mountain snowberry
Caryophyllaceae	**Pink family**
Arenaria macrophylla	big-leaf sandwort
***Cerastium viscosum*	sticky chickweed
Silene menziesii	Menzies' silene
***Stellaria media*	chickweed
Cornaceae	**Dogwood family**
Cornus serecia	red-osier dogwood

Cupressaceae	**Cypress family**
Juniperus occidentalis	western juniper
Cyperaceae	**Sedge family**
Carex athrostachya	slenderbeak sedge
Carex backii	Back's sedge
Carex hoodii	Hood's sedge
Carex microptera	small-winged sedge
Eleocharis palustris	common spike-rush
Dryopterridaceae	**Wood fern familiy**
Cysopteris fragilis	brittle bladder-fern
Equisetaceae	**Horsetail family**
Equisetum arvense	common horsetail
Equisetum hyemale	common horsetail
Equisetum laevigatum	smooth horsetail
Euphorbiaceae	**Spurge family**
Chamaesyce serpyllifolia	thyme-leaved spurge
Fabaceae	**Pea family**
***Medicago lupulina*	black medic
***Melilotus alba*	white sweet-clover
***Melilotus officinalis*	yellow sweet-clover
***Robinia pseudo-acacia*	black locust
***Trifolium repens*	white clover
Geraniaceae	**Geranium family**
Geranium viscosissimum	sticky geranium
Grossulariaceae	**Currant family**
Ribes aureum	golden currant
Ribes cereum	squaw currant
Ribes niveum	snow gooseberry
Hydrangeaceae	**Hydrangea family**
Philadelphus lewisii	syringa
Hydrophyllaceae	**Waterleaf family**
Hydrophyllum capitatum	waterleaf woolly breeches
Nemophila breviflora	Great Basin nemophila
Nemophila kirtleyi	Snake River Canyon nemophila
Phacelia procera	tall phacelia

Juncaceae	**Rush family**
Juncus bufonius	toad rush
Juncus ensifolius	dagger-leaf rush
Juncus tenuis	slender rush
Juncus torreyi	Torrey's rush
Lamiaceae	**Mint family**
Agastache urticifolia	nettle-leaf horse-mint
Mentha arvense	field mint
***Nepeta cataria*	catnip
Lemnaceae	**Duckweed family**
Lemna sp.	duckweed
Liliaceae	**Lily family**
Allium acuminatum	tapertip onion
Brodiaea douglasii	Douglas' brodiaea
Disporum trachycarpum	Sierra fairy-bell
Smilacina stellata	starry Solomon-plume
Trillium petiolatum	purple trillium
Malvaceae	**Mallow family**
Iliamna rivularis	streambank globemallow
Moraceae	**Mulberry familiy**
***Morus alba*	white mulberry
Onagraceae	**Evening primrose family**
Circaea alpina	enchanter's nightshade
Epilobium brachycarpum	tall annua1 willow-herb
Epilobium ciliatum	American willow-herb
Epilobium densiflorum	dense spike-primrose
Oenothera elata	western evening-primrose
Oenothera villosa	common evening-primrose
Pinaceae	**Pine family**
Pseudotsuga menziesii	Douglas-fir
Plantaginaceae	**Plantain family**
***Plantago major*	common plantain

Poaceae	**Grass family**
Agropyron smithii	western wheatgrass
Agrostis exarata	spike bentgrass
***Agrostis stolonifera*	redtop bentgrass
Bromus carinatus	mountain brome
***Bromus inermis*	smooth brome
***Bromus japonicus*	Japanese brome
***Bromus sterils*	barren brome
***Bromus tectorum*	cheatgrass
Calamagrostis rubescens	pinegrass
Catabrosa aquatica	brookgrass
Deschampsia elongata	slender hairgrass
***Echinochloa crusgalli*	large barnyard-grass
***Elymus caput-medusea*	medusahead rye
Elymus cinereus	basin wildrye
Elymus glaucus	blue wildrye
Glyceria elata	tall mannagrass
Leersia oryzoides	cutgrass
Paspalum distichum	knotgrass
***Phleum pratense*	common timothy
***Poa bulbosa*	bulbous bluegrass
***Poa compressa*	Canada bluegrass
***Poa pratensis*	Kentucky bluegrass
***Polypogon monspeliensis*	rabbitfoot polypogon
Puccinelia pauciflora	weak alkaligrass
Sitanion hystrix	squirreltail
Stipa occidentalis	western needlegrass
Polemoniaceae	**Phlox family**
Collomia grandiflora	large-flowered collomia
Polygonaceae	**Buckwheat family**
***Polygonum convolutus*	dullseed
Polygonum douglasii	Douglas' knotweed
***Rumex crispus*	curly dock
***Rumex obtusifolius*	bitterdock
Rumex salicifolius	willow dock
Portulacaceae	**Purslane family**
Montia perfoliata	miner's lettuce

Ranunculaceae	**Buttercup family**
Aconitum columbianum	Columbia monkshood
Aquilegia formosa	red columbine
Clematis ligusticifolia	western clematis
Delphinium occidentale	duncecap larkspur
Ranunculus cymbalaria	shore buttercup
Ranunculus inamoenus	unlovely buttercup
Ranunculus uncinatus	little buttercup
Rosaceae	**Rose family**
Amelanchier alnifolia	serviceberry
Crataegus columbiana	Columbia hawthorn
Crataegus douglasii	black hawthorn
Geum triflorum	prairie smoke
***Malus pumila*	common apple
Physocarpus malvaceus	mallow ninebark
Potentilla gracilis	slender cinquefoil
***Prunus armencia*	apricot
Prunus emarginata	bitter cherry
Prunus virginiana	chokecherry
Rosa woodsii ultramontana	Wood's rose
Rubus leucodermis	blackcap
Spiraea betulifolia	shiny-leaf spiraea
Rubiaceae	**Madder family**
Galium aparine	goose-grass cleavers
Galium trifidum	small bedstraw
Galium triflorum	sweetscented bedstraw
Salicaceae	**Willow family**
Populus tremuloides	quacking aspen
Populus trichocarpa	black cottonwood
***Salix babylonica*	weeping willow
Salix exigua	sandbar willow
Salix lasiandra	Pacific willow
Salix lasiolepis	arroyo willow
Salix lutea	yellow willow
Salix scouleriana	Scouler's willow
Saxifragaceae	**Saxifrage family**
Lithophragma parviflora	small flowered prairie star

Scrophulariaceae	**Figwort family**
Collinsia parviflora	blue-eyed Mary
Mimulus guttatus	yellow monkeyflower
Penstemon glandulosus	sticky penstemon
Tonella floribunda	large-flowered tonella
***Verbascum thapsus*	flannel mullein
***Veronica anagallis-aquatica*	water pimpernel
***Veronica arvensis*	common speedwell
***Veronica biloba*	bilobed speedwell
Solanaceae	**Nightshade familiy**
***Solanum dulcamara*	bittersweet
Ulmaceae	**Elm family**
Celtis reticulata	netleaf hackberry
Urticaceae	**Nettle family**
Parietaria pensylvanica	pellitory
Urtica dioica	stinging nettle
Violaceae	**Violet familiy**
Viola glabella	stream violot
Viola nuttallii	Nutthall's violet
Viola orbiculata	round-leaved violet