

SECTION THREE

Table #6: Threatened, endangered and sensitive fish species that are known to occur within the Harney-Malheur Lakes Sub-basin.

COMMON NAME	SCIENTIFIC NAME	STATUS
Malheur mottled sculpin	<i>Cottus bairdi bairdi</i>	Sensitive
redband trout	<i>Onchorhynchus mykiss</i> <i>spp.</i>	Sensitive

VEGETATION

The sub-basin vegetative types vary according to elevation, topography, precipitation, soil type, and length of growing season. Vegetative types are specific to the forest, foothill transition zone, and the valley with its meadows and lake habitat. Map 15 gives perspective on historic plant associations in the sub-basin while Map 16 shows the current vegetation and general plant communities on BLM-administered lands. These lands are located primarily in the uplands surrounding Harney Valley as well as lower elevation lands in the general locales of Dog Mountain, New Princeton, Voltage and Happy Valley.

Table #7: Following are Harney County historic plant associations.

LOW ELEVATION LAKE BASINS AND VALLEYS

Saline-Sodic Lake Basins & Playas: Soil Association #1		
playas without vegetation		Playas
greasewood/saltgrass, alkaligrass associations		Sodic Flats
basin big sagebrush/greasewood/basin wild rye		Sodic Bottomlands
Playas	No number	
Sodic Flat	024XY001OR	SAVE4/DISPS2
Sodic Dunes	024XY005OR	ARTRT/SAVE4/ORHY/ STCO4
Sodic Meadow	024XY002OR	SPAI/DISPS2/POJU
Sodic Lake Terrace	024XY114OR	SAVE4/DISPS2/PUCCI
Sodic Bottom	024XY003OR	SAVE4/LECI4/DISPS2
Clay Basin 6-8	024XY010OR	ATCO/ARSP5/ELEL5
Dry Basin	024XY009OR	ARTRT/SAVE4/LECI4

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Saline-Sodic Lake Terraces & Fans: Soil Association #2		
mixed desert shrubs associations—greasewood, shadscale, spiny hopsage and/or basin big sagebrush		Sodic Terraces and Fans
Low Sodic Terrace	024XY013OR	SAVE4/ATCO/GRSP/ELEL5
Sodic Terrace	024XY014OR	ARTRT/GRSP/SAVE4/ORHY
Sodic Fan	024XY113OR	ARTRT/SAVE4/ORHY/LECI4
Dry Sodic Floodplain	024XY112OR	SAVE4/ARTRT/DISPS2/LECI4

Marshes and Meadows: Soil Association #4		
bulrush, burreed, cattail associations		Marshes
Nebraska sedge, Baltic rush, creeping wild rye association		Meadows
Wet Marsh	023XY115OR	SCAC/SPEU
Semi-Wet Marsh	023XY116OR	TYPHA
Basin Wet Meadow	023XY117OR	CANE2/JUB/ELEOC
Basin Dry Meadow	023XY118OR	LETR5
Loamy Bottom	023XY104OR	ARTRT/LECI4

Seasonal Floodplains, Bottomlands and Playas: Soil Association #2 and 11		
basin big sagebrush/Basin wild rye association		Floodplains
silver sage/Nevada bluegrass/creeping wild rye		Ponded Swale
Wyoming big sagebrush/Sandberg bluegrass		Dry Playas
Dry Floodplain	024XY004OR	ARTRT/LECI4/LETR5
Ponded Clay	023XY200OR	ARCA13/POSE3/LETR5
Lakebed	023XY100OR	ELEOC/RUMEX/JUBA
Lake Terrace	024XY006OR	LETR5
Clayey Playette	024XY008	ARTRW8/ELEL5/STTH2/POSE4
SR Swale 9-12	010XC013OR	ARTRT/LECI4/PSSPS/STCO4
Loamy Bottom	010XY005OR	LECI4
Braided Bottom	010XY010OR	SALIX/CAREX/DECA5
Sodic Bottom	010XY007OR	SAVE4/LECI4/DIST
JD Gravelly Fan 9-12	010XB020OR	ARTRT/PSSPS/STTH2/LECI4

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Silty Lake Terraces (Catlow 6-10 ppt): Soil Association #2

winterfat association		Silty Dry Terraces
Silty 6-10	024XY011OR	KRLA2/ATGA/ORHY
Dry Ponded Clay 6-10	024XY007OR	ATRT/LETR5

Sandy to Loamy Terraces (6-12 ppt): Soil Association #3

basin big sagebrush/needle-and-thread/ricegrass association		6-10 ppt.
basin big sagebrush/needle-and-thread/Thurber needlegrass		10-12 ppt.
Sandy 6-10	024XY012OR	ATCA2/ARTRT/STCO4/ORHY
Loamy 8-10	024XY016OR	ARTRW8/STTH2/ORHY/PSSPS
Sandy Loam 8-10	024XY018OR	ARTRT/STCO4/ORHY
Dunes	024XY110OR	ARTRT/STCO4/ORHY
Silt Loam Terrace 10-12	023XY019OR	ARTRT/PSSPS/LECI4
Sandy Loam 10-12	023XY213OR	ARTRT/STCO4/STTH2
Sandy Slopes 10-12	023XY303OR	ARTRT/PUTR2/STCO4/ORHY
Loamy 10-12/Sandy Loam 10-12 cmx.	023XY212OR 023XY213OR	

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WARM LOW PPT TERRACES, FOOTSLOPES AND PLATEAUS

Warm Shallow Terraces and Plateaus (6-10 ppt): Soil Association #5 and 7		
shadscale/budsage		Slightly Sodic Soils
Wyoming big sagebrush/Thurber needlegrass		Non-Sodic Soils
mixed desert shrub associations—Wyoming big sagebrush, shadscale, spiny hopsage and/or ephedra		Pueblo Foothills
Desert Loam 6-10	024XY015OR	ATCO/ARSP5/ORHY
Shallow Loam 8-10/Desert Loam 6-10 cmx.	024XY017 024XY015OR	
Shallow Loam 8-10	024XY017OR	ARTRW8/STTH2/ORHY/PSSPS
Shallow Loamy Slopes 6-10	024XY030OR	ARTRW8/ORHY/STTH2
Droughty Shallow Slopes 6-10	024XY031OR	ATCO/ARSP5/ORHY/LEL5
South Slopes 6-10	024XXY032OR	ARTRW8/SADOC2/ORHY/STSP3
North Slopes 6-10	024XXXY033OR	ARTRW8/PSSPS/STTH2
Shrubby Loam 8-10	024XY020OR	ARTRW8/EPHED/STTH2/PSSPS

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Warm Foothills (Malheur Drainage 9-12 ppt): Soil Association #6		
Wyoming big sagebrush/bluebunch wheatgrass association		Foothills
SR Clayey 9-12	010XC021OR	ARTRW/PSSPS/POSE
SR Mt. Loamy 9-12	010XC030OR	ARTRW/FEID/STTH2/ POSE4
SR Shallow 9-12	010XC035OR	ARTRW/PSSPS/STTH 2
SR Adobeland 9-12	010XC018OR	LECI4/PSSPS
SR Loamy 9-12	010XC020OR	ARTRW/PSSPS/STTH 2/STCO4
SR Mountain Shallow 9-12	010XC036OR	ARTRW/FEID/PSSPS/ POSE4
SR Clayey South 9-12	010XC043OR	ARTRW/PSSPS/STTH 2/POSE4
SR Shallow South 9-12	010XC050OR	ARTRW/PSSPS/STTH 2/POSE4
SR Maintain North 9-12	010XC065OR	ARTRW/FEID/PSSPS/ POSE4
SR Shallow Escarpment 9-12	010XC057OR	ARTRW/PERA4/PSSP S/STTH2

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COLD PLATEAUS, BUTTES AND MOUNTAINS

Cold Plateaus and Uplands (10-12 ppt.): Soil Association #7		
Wyoming big sagebrush/Thurber needlegrass-bluebunch wheatgrass		High Desert Plateaus (Loamy Soils)
low sagebrush/Thurber needlegrass-bluebunch wheatgrass		High Desert Plateaus (Claypan Soils)
Loamy 10-12	023XY212OR	ARTRW8/STTH2
Clayey 10-12	023XY220OR	ARTRW8/PSSPS
Claypan 10-12	023XY214OR	ARAR8/PSSPS/POSE4
Shallow Gravelly Loam 10-12	023XY215OR	ARAR8/STTH2/POSE4
Thin Surface 8-14	024XY021OR	ARARN/ELEL5/POSE4
South Slopes 8-12	023XY300OR	ARTRW8/PSSPS/STTH2
North Slopes 10-12	023XY308OR	ARTRW8/FEID/PSSPS
Swale 10-14	023XY202OR	ARTRT/LECI4PSSPS
Shallow Swale 10-14	023XY324OR	ARAR8/POSE3/POSE4
Shallow Lava 10-12	023XY222OR	ART/STTH2/PSSPS/POSE4
Pumice 10-12	023XXY210OR	ARTRV-PUTR2/FEID/STTH2-STOC2

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Cold High Plateaus and Buttes (12-16 ppt): Soil Association #8		
mountain big sagebrush/Idaho fescue-Thurber needlegrass		High Desert Plateaus (Loamy Soils)
low sagebrush/Idaho fescue-Thurber needlegrass		High Desert Plateaus (Claypen Soils)
Loamy 12-16	023XY318OR	ARTRV/FEID/STTH2
Droughty Loam 11-13	023XY316OR	ARTRT/FEID/STTH2
Claypan 12-16	023XY216OR	ARAR8/FEID/PSSPS/POSE4
Thin Surface Claypan 10-16	023XY218OR	ARAR8/POSE4
Droughty South Slopes 11-13	023XY301OR	ARTRT/PSSPS/STTH2
South Slopes 12-16	023XY302OR	ARTRV/PUTR2/PSSPS
North Slopes 12-16	023XY310OR	ARTRV/FEID
Shallow North 12-16	023XY312OR	ARAR8/FEID/PSSPS
Gravelly North Slopes 12-16	023XY314OR	ARTR4/FEID
Juniper South Slopes 12-16	023XY320OR	JUOC/ARTRV/PSSPS/FEID
Deep North 12-16	023XY404OR	ARTRV/SYOR2/FEID
Swale 12-16	023XY406OR	ARTRV/SYOR2/LECI4
Rocky Ridges 12-16	023XY408OR	CELE3/ARTRV/FEID
Wet Meadow	023XY416OR	DECA5/CANE2

Riparian vegetation along the streams is determined by elevation and stream gradient. The dominant overstory species in the upper elevations and foothills above the northern part of Harney Valley are alder, dogwood, willow, chokecherry, juniper, cottonwood and ponderosa pine. The understory is a combination of sedges, rushes, Timothy, meadow foxtail, clover, tufted hairgrass and other forbs. The upper riparian areas in the other surrounding valley foothills contain an overstory of alder, willow, and juniper and an understory of sagebrush, sedges, rushes, meadow foxtail, Timothy, watercress, clover and other forbs. Lower riparian vegetation is willows, sagebrush, rabbitbrush, sedges, rushes and forbs.

The relatively small area of forested lands in the northern part of the sub-basin consists of pure ponderosa pine stands, pure juniper stands, and mixed conifer stands, which include ponderosa pine and Douglas fir. Fire suppression, insect infestation and areas of dense road construction have negatively impacted this area of the forest. Small stands of quaking aspen are still growing around springs and along streams. Juniper have invaded aspen stands, utilized the water needed to maintain the small aspen groves and eliminated many sites. Aspen usually spread by cloning and are maintained and spread by fire and other disturbance such as felling of older trees by beaver. Lack of such disturbance in recent times has contributed to stand loss.

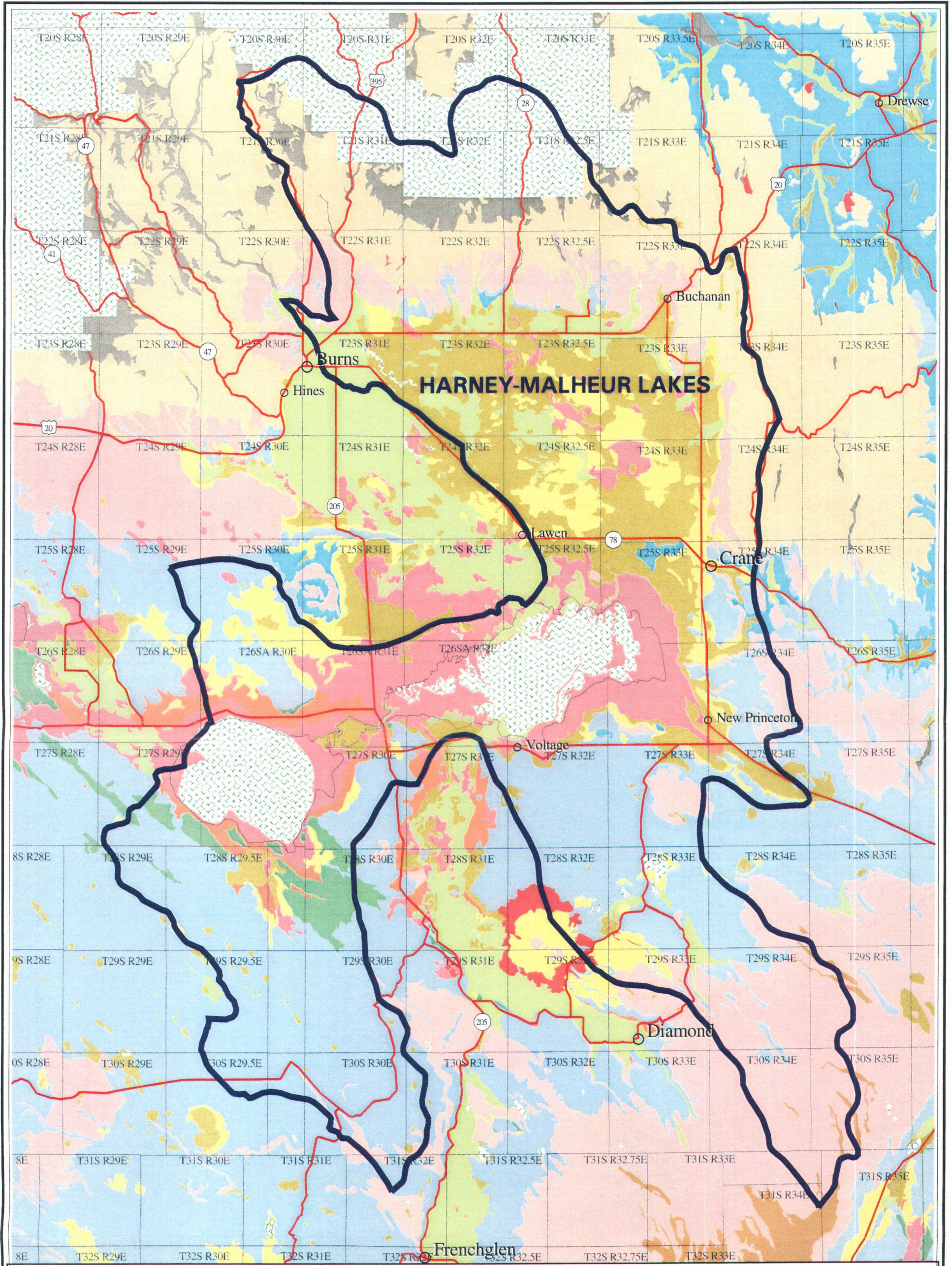
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Below the forest is the foothill transition zone where mountain mahogany, juniper, bitterbrush and sagebrush/grass communities are dominant although interspersed with scattered ponderosa pine and the occasional fir. Juniper has become widespread in the transition zone, although it has also moved into the conifer forest and the lower, sagebrush dominant valley bottoms. The trees were historically found on wind swept ridges where fire was not as frequent as in the lower elevations. Junipers are not fire resistant and any tree less than 4 inches in diameter is very susceptible to fire. Lack of fire has encouraged the spread of juniper.

Sagebrush/grass communities are dominant below the foothill transition zone. In this zone, areas with shallow soil are dominated by low sagebrush and Sandberg's bluegrass. In areas of deeper soil Wyoming big sagebrush is the dominant shrub. The main grasses are blue-bunch wheat grass and Idaho fescue with the fescue being found in slightly higher and moister spots while the wheatgrass is able to tolerate drier areas. Greasewood and rabbitbrush in addition to salt grass and basin wild rye are prevalent in Harney Valley as the soil becomes more alkaline nearer the lakes. Large areas of sagebrush have been removed and replaced with irrigated fields.

The introduction of Russian thistle and cheatgrass has had a major impact on the plant composition of the sub-basin. Once the soil is disturbed, these invasive plants establish quickly before native plants can begin to grow. Large areas of these introduced plants are now evident. Perennial pepperweed is another invasive plant that has covered large areas in the southern part of Harney Valley.

There are 14 sensitive plants known to occur in the sub-basin (Table #8).



MAP #15 - HARNEY-MALHEUR LAKES SUBBASIN - HISTORIC PLANT ASSOCIATIONS (NRCS)

- | | |
|--|------------------------------------|
| 1 Saline-Sodic Lake Basins & Playas | 8 Warm Foothills |
| 2 Saline-Sodic Lake Terraces & Fans | 9 Cold Plateaus & Uplands |
| 3 Marshes, Meadows & Bottomlands | 10 Cold High Plateaus & Buttes |
| 4 Seasonal Floodplains, Dry Basins, Playas | 11 Cold Upland & Mountain Plateaus |
| 5 Silty Dry Lake Terraces | 12 Cold High Mountains |
| 6 Sandy Lake Terraces | 13 Forest & Forest Fringe |
| 7 Warm Shallow Terraces & Plateaus | Rock outcrop and rubble land |
| USFS and Out Areas (No Data Available) | |



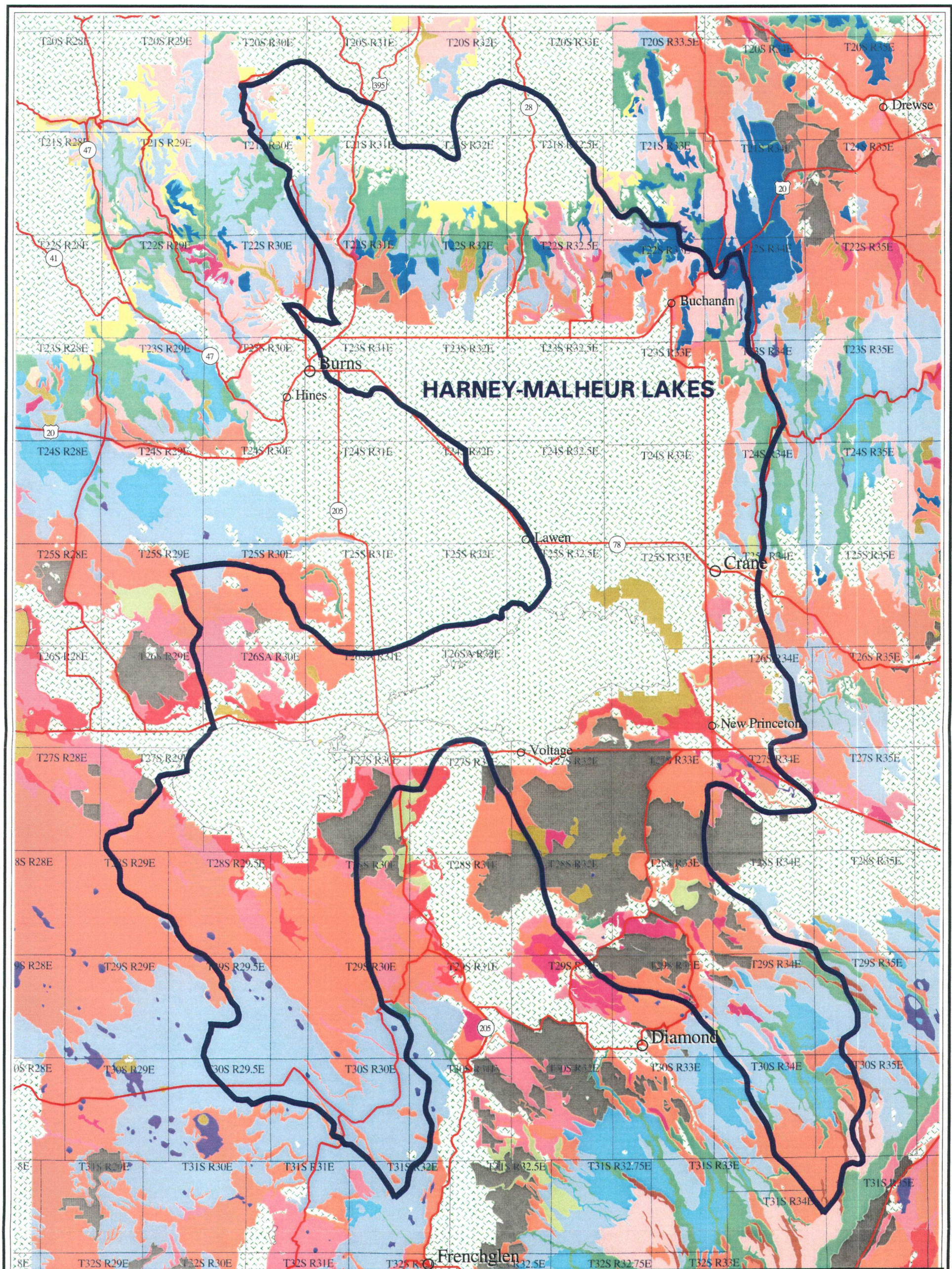
Scale: 1 inch = 5.6 miles



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MAP #16 - CURRENT VEGETATION - GENERAL PLANT COMMUNITIES (BLM)

- | | |
|-----------------------------------|----------------------------------|
| Big Sagebrush/Annual Grassland | Low Sagebrush/Grassland |
| Big Sagebrush/Perennial Grassland | Mountain Big Sagebrush/Grassland |
| Annual Grassland | Mountain Shrub/Grassland |
| Native Perennial Grassland | Quaking Aspen |
| Crested Wheatgrass/Sagebrush | Rabbitbrush/Grassland |
| Forested | Salt Desert Shrub/Grassland |
| Juniper/Big Sagebrush | Silver Sagebrush/Grassland |
| Juniper/Low Sagebrush | Stiff Sagebrush |

Out Areas (USFS, USFWS, Private)
(No Data Available)

0 1 2 3 4 5 6
MILES
Scale: 1 inch = 5.6 miles

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Table #8: Threatened, endangered and sensitive plant species known to occur within the Harney-Malheur Lakes Sub-basin.

COMMON NAME	SCIENTIFIC NAME	STATUS
Columbia cress	<i>Rorippa columbiae</i>	Sensitive
Deschutes milkvetch	<i>Astragalus tegetarioides</i>	Sensitive
four-wing milkvetch	<i>Astragalus tetrapterus</i>	Sensitive
iodine bush	<i>Allenrolfea accidentalis</i>	Sensitive
least snapdragon	<i>Antirrhinum kingii</i>	Sensitive
lowland rotala	<i>Rotala ramosior</i>	Sensitive
Malheur wirelettuce	<i>Stephanomeria malheurensis</i>	Endangered
mousetail	<i>Myosurus clavicaulis</i>	Sensitive
nodding melic	<i>Melica stricta</i>	Sensitive
raven's biscuitroot	<i>Lomatium ravenii</i>	Sensitive
seaside heliotrope	<i>Heliotropium curassavicum</i>	Sensitive
short-lobed penstemon	<i>Penstemon seorsus</i>	Sensitive
Sierra onion	<i>Allium campanulatum</i>	Sensitive
wheat sedge	<i>Carex atherodes</i>	Sensitive

SOILS

There are five general soil groups within the sub-basin. These are categorized as: 1) warm soils on terraces, low hills and basin floors; 2) cool soils on terraces and basin floors; 3) cool soils on mountains; 4) cool soils on shrub and grass-covered tablelands and hills having 8-16 inches of precipitation; 5) cool soils on forested, and shrub and grass-covered hills having 12-18 inches of precipitation. Soil types within the soil groups are shown in Table #9.

Table #9:

WARM SOILS ON TERRACES, LOW HILLS AND BASIN FLOORS

Alvodeest-Droval-Playas	
Somewhat poorly to very poorly drained. Very deep soils formed in lacustrine sediments on low lake terraces and basin floors.	
Percentage of Survey Area:	4%
Elevation:	4,000 to 4,600 feet
Average Annual Precipitation:	6 to 10 inches
Temperature:	45 ° F. to 49 ° F.
Frost-Free Period:	80 to 100 days
Dominant Slopes	0 to 3%
Dominant Vegetation:	Black greasewood, inland saltgrass, basin wild rye
Minor Components:	Ozamis, Icene, Mesman, Boravall,

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	Dixon
Dominant Land Uses:	Livestock grazing and wetland wildlife habitat
Major Limitations for Use:	Hazard of ponding, alkalinity, salinity

Spangenburg-Enko-Catlow

Well or moderately well drained. Very deep soils formed in lacustrine sediments and alluvium on middle lake terraces.	
Percentage of Survey Area:	8%
Elevation:	4,200 to 5,300 feet
Average Annual Precipitation:	8 to 12 inches
Temperature:	45 ° F. to 49 ° F.
Frost-Free Period:	80 to 100 days
Dominant Slopes	0 to 20%
Dominant Vegetation:	Basin big sagebrush, Wyoming big sagebrush, creeping wild rye, bluebunch wheatgrass, Thurber needlegrass, basin wildrye, Indian ricegrass, needle-and-thread grass
Minor Components:	Outerkirk, Norad, Goldrun, Defenbaugh, Rio King, and Nevador soils
Dominant Land Uses:	Livestock grazing and irrigated alfalfa production
Major Limitations for Use:	Hazard of wind erosion

Atlow-Tumtum-Deppy

Well drained, very shallow or shallow soils formed in old alluvium, residuum, or colluvium on high lake terraces.	
Percentage of Survey Area:	5%
Elevation:	3,400 to 5,300 feet
Average Annual Precipitation:	6 to 10 inches
Temperature:	45 ° F. to 49 ° F.
Frost-Free Period:	80 to 100 days
Dominant Slopes	2 to 50%
Dominant Vegetation:	Shadscale, bud sagebrush, Wyoming big sagebrush, bluebunch wheatgrass, Indian ricegrass, Thurber needlegrass
Minor Components:	Kerrfield, Bruncan, Vining, and Ladycomb soils
Dominant Land Uses:	Livestock grazing
Major Limitations for Use:	Hazard of water erosion, soil depth, droughtiness

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WARM SOILS ON HILLS, TABLELANDS AND MOUNTAINS

Gumble-Risley-Mahoon	
Well drained, shallow or moderately deep soils formed in residuum, and colluvium on hills and tablelands.	
Percentage of Survey Area:	3%
Elevation:	3,400 to 4,800 feet
Average Annual Precipitation:	9 to 12 inches
Temperature:	45 ° F. to 49 ° F.
Frost-Free Period:	80 to 100 days
Dominant Slopes	0 to 40%
Dominant Vegetation:	Wyoming big sagebrush, bluebunch wheatgrass, Thurber needlegrass, Sandberg bluegrass
Minor Components:	Porterfield, Torriorthents, and Cagle soils
Dominant Land Uses:	Livestock grazing
Major Limitations for Use:	Hazard of water erosion, soil depth, droughtiness

Felcher-Skedaddle	
Well drained, very shallow to moderately deep soils that formed in colluvium and residuum on mountains.	
Percentage of Survey Area:	4%
Elevation:	4,100 to 7,100 feet
Average Annual Precipitation:	8 to 12 inches
Temperature:	45 ° F. to 49 ° F.
Frost-Free Period:	80 to 100 days
Dominant Slopes	20 to 70%
Dominant Vegetation:	Wyoming big sagebrush, shadscale, bud sagebrush, Indian ricegrass, bluebunch wheatgrass, Thurber needlegrass, desert needlegrass
Minor Components:	Westbutte and Fitzwater soils
Dominant Land Uses:	Livestock grazing
Major Limitations for Use:	Hazard of water erosion, soil depth, steepness, droughtiness

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COOL SOILS ON TERRACES AND BASIN FLOORS

Fury-Skunkfarm-Housefield	
Somewhat poorly to very poorly drained, very deep soils formed in alluvium and lacustrine sediments on stream terraces, and lake terraces.	
Percentage of Survey Area:	4%
Elevation:	4,000 to 5,100 feet
Average Annual Precipitation:	8 to 10 inches
Temperature:	43 ° F. to 45 ° F.
Frost-Free Period:	50 to 80 days
Dominant Slopes	0 to 2%
Dominant Vegetation:	Nebraska sedge, Baltic rush, creeping wildrye, hardstem bulrush, broadfruit burreed, and spikerush
Minor Components:	Widowspring, Skidoosprings, Degarmo, Opie, McBain, Cumulic Haploxerolls and Jimgreen soils
Dominant Land Uses:	Livestock grazing, native hay production, and wetland wildlife habitat
Major Limitations for Use:	Hazard of ponding

Poujade-Ausmus-Swalesilver	
Moderately well and somewhat poorly drained, very deep soils formed in lacustrine sediments, and alluvium on middle lake terraces.	
Percentage of Survey Area:	5%
Elevation:	4,000 to 4,500 feet
Average Annual Precipitation:	8 to 12 inches
Temperature:	43 ° F. to 45 ° F.
Frost-Free Period:	50 to 80 days
Dominant Slopes	0 to 5%
Dominant Vegetation:	Basin big sagebrush, black greasewood, silver sagebrush, basin wildrye, inland saltgrass, creeping wildrye, Nevada bluegrass
Minor Components:	Skidoosprings, Crowcamp, The Narrows, Fury, Duckclub, Lolak, playas, and Opie soils
Dominant Land Uses:	Livestock grazing, irrigated alfalfa production, and wetland wildlife habitat
Major Limitations for Use:	Hazard of ponding, alkalinity, salinity

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Reallis-Vergas-Lawen

Well drained, very deep soils that formed in alluvium and eolian material on high lake terraces and fan terraces.

Percentage of Survey Area:	5%
Elevation:	4,000 to 6,000 feet
Average Annual Precipitation:	10 to 12 inches
Temperature:	43 ° F. to 45 ° F.
Frost-Free Period:	50 to 80 days
Dominant Slopes	0 to 8%
Dominant Vegetation:	Basin big sagebrush, Wyoming big sagebrush, Thurber needlegrass, needle-and-thread grass
Minor Components:	Carvix, Widowspring, Voltage, Swaler, Swalesilver and Sandgap soils
Dominant Land Uses:	Livestock grazing and irrigated alfalfa production
Major Limitations for Use:	Hazard of wind erosion

COLD SOILS ON MOUNTAINS

Baconcamp-Clamp-Rock Outcrop

Well drained, shallow or moderately deep soils formed in residuum, and colluvium.

Percentage of Survey Area:	5%
Elevation:	5,100 to 9,200 feet
Average Annual Precipitation:	12 to 40 inches
Temperature:	40 ° F. to 43 ° F.
Frost-Free Period:	30 to 50 days
Dominant Slopes	5 to 80%
Dominant Vegetation:	Mountain big sagebrush, antelope bitterbrush, Idaho fescue, rough fescue, tufted hairgrass, sheep fescue
Minor Components:	Hackwood, Duff, Krackle, Hapgood, Leemorris, Gilispie, Buckwilder, and Dickie soils
Dominant Land Uses:	Livestock grazing, wildlife habitat and recreation
Major Limitations for Use:	Steepness, rockiness, hazard or water erosion, short growing season

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COOL SOILS ON SHRUB AND GRASS COVERED TABLELANDS AND HILLS HAVING 8 TO 16 INCHES OF PRECIPITATION

Raz-Brace-Anawalt	
Well drained, shallow or moderately deep soils formed in residuum and colluvium on tablelands having 8 to 12 inches of precipitation.	
Percentage of Survey Area:	30%
Elevation:	4,100 to 6,200 feet
Average Annual Precipitation:	8 to 12 inches
Temperature:	43 ° F. to 45 ° F.
Frost-Free Period:	50 to 80 days
Dominant Slopes	0 to 30%
Dominant Vegetation:	Wyoming big sagebrush, low sagebrush, Thurber needlegrass, bluebunch wheatgrass, Indian ricegrass, needle-and-thread grass, Sandberg needlegrass
Minor Components:	Actem, Robson, Carryback, Lonely
Dominant Land Uses:	Livestock grazing
Major Limitations for Use:	Steepness, rockiness, droughtiness, hazard of water erosion

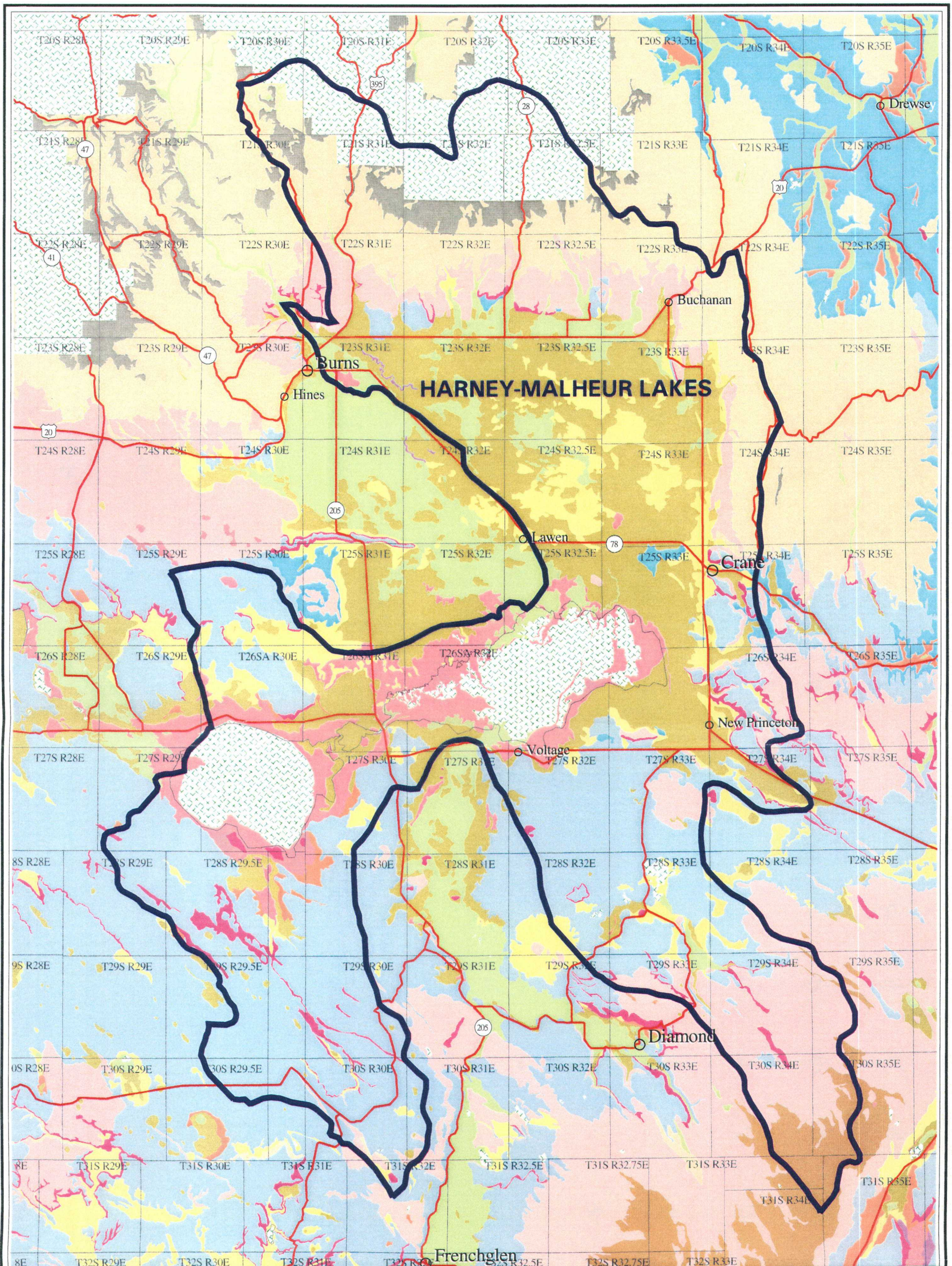
Ninemille-Westbutte-Carryback	
Well drained, shallow and moderately deep soils that formed in residuum and colluvium on tablelands and hills having 12 to 16 inches of precipitation.	
Percentage of Survey Area:	15%
Elevation:	3,900 to 7,500 feet
Average Annual Precipitation:	12 to 16 inches
Temperature:	43 ° F. to 45 ° F.
Frost-Free Period:	50 to 80 days
Dominant Slopes	0 to 70%
Dominant Vegetation:	Western juniper, low sagebrush, mountain big sagebrush, Idaho fescue
Minor Components:	Pernty, Reluctan, Lambring, Doyn, Teguro, Ateron, and Edemaps soils
Dominant Land Uses:	Livestock grazing
Major Limitations for Use:	Steepness of slope, rockiness, droughtiness, hazard of water erosion

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COOL SOILS ON FORESTED, AND SHRUB-AND-GRASS COVERED HILLS HAVING 12 TO 18 INCHES OF PRECIPITATION

Merlin-Observation-Lambring	
Well drained, shallow to very deep soils formed in residuum and colluvium on shrub and grass covered hills.	
Percentage of Survey Area:	10%
Elevation:	3,900 to 6,000 feet
Average Annual Precipitation:	12 to 16 inches
Temperature:	43 ° F. to 45 ° F.
Frost-Free Period:	50 to 80 days
Dominant Slopes	0 to 70%
Dominant Vegetation:	Western juniper, curleaf mountain mahogany, low sagebrush, mountain big sagebrush, antelope bitterbrush, Idaho fescue, one-spike oatgrass, basin wildrye
Minor Components:	Doyn, Teguro, and Vitale soils
Dominant Land Uses:	Livestock grazing
Major Limitations for Use:	Steepness, rockiness, hazard of water erosion

Gaib-Anatone-Royst	
Well drained, shallow or moderately deep soils formed in residuum and colluvium on forested hills, tablelands and canyon sides having 14 to 18 inches of precipitation.	
Percentage of Survey Area:	1%
Elevation:	4,000 to 6,000 feet
Average Annual Precipitation:	14 to 18 inches
Temperature:	43 ° F. to 45 ° F.
Frost-Free Period:	50 to 80 days
Dominant Slopes	2 to 60%
Dominant Vegetation:	Ponderosa pine, western juniper, curleaf mountain mahogany, low sagebrush, mountain big sagebrush, antelope bitterbrush, Idaho fescue, and one-spike oatgrass
Minor Components:	Observation, Egyptcreek, Klicker, Mound, Lambring, Merlin, and Teguro soils
Dominant Land Uses:	Livestock grazing and forest products
Major Limitations for Use:	Steepness, rockiness, hazard of water erosion



MAP #17 - HARNEY-MALHEUR LAKES SUBBASIN - GENERAL SOILS (NRCS)

- | | |
|------------------------------|---|
| 1 Alvodest-Droval-Playas | 8 Reallis-Vergas-Lawen |
| 2 Spangenburg-Enko-Catlow | 9 Baconcamp-Clamp-Rock outcrop |
| 3 Atlow-Tumtum-Deppy | 10 Raz-Brace-Anawalt |
| 4 Gumble-Risley-Mahoon | 11 Ninemile-Westbutte-Carryback |
| 5 Felcher-Skedaddle | 12 Merlin-Observation-Lambring |
| 6 Fury-Skunkfarm-Housefield | 13 Gaib-Anatone-Royst |
| 7 Poujade-Ausmus-Swalesilver | USFS and Out Areas
(No Data Available) |

0 1 2 3 4 5 6
MILES
Scale: 1 inch = 5.6 miles



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SECTION THREE

PROPER FUNCTIONING CONDITION

Proper Functioning Condition (PFC) is a methodology used by the U. S. Forest Service (USFS), Bureau of Land Management (BLM), Natural Resource Conservation Service (NRCS) and private individuals to assess the functionality of stream systems. PFC of a stream is determined relative to the stream's capability and potential given no political, social or economic constraints. PFC is identified as the minimum standard for streams. This method is beneficial because a wide variety of groups can compare like information, but it is controversial due to the lack of "hard numbers." There are five categories involved in this methodology: 1) PFC; 2) functional-at-risk with an upward trend; 3) functional-at-risk with a downward trend, 4) functional-at-risk—trend not apparent; and 5) non-functional. (See glossary.)

PFC for all stream miles managed by the BLM within the Harney-Malheur Lakes Sub-basin has been assessed. The USFS has determined PFC on many miles of their managed streams, but still have assessments to complete. PFC has not been completed along any streams on private land within the sub-basin. Proper Functioning Condition has been determined for 38.4 stream miles with 19.7 miles at PFC, 18.7 miles functioning at risk and 0 miles as non-functional (Map 18). All assessed stream miles are on BLM-administered lands. No data is available for stream miles on forest service-administered lands or for stream miles on private lands. *(See Appendix E for specific stream PFC. Note that total miles are not the same as shown on Map 18 due to map source data.)*

WATER QUALITY LIMITED STREAMS

Section 303(d) of the Clean Water Act requires the State Department of Environmental Quality (DEQ) to identify those waters that are "water quality" limited based on the requirements of the most sensitive designated beneficial use. Cold-water fish are generally the beneficial use that parameters are based upon in this area.

The majority of 303(d) listed streams in Eastern Oregon are placed on the list because they exceed the seven-day average of daily maximums for temperature during the summer months. Very few streams in this area meet the State Water Quality Standards during the summer months of July through September. It is debatable as to whether or not these temperature standards are realistic or achievable in most stream systems. The Oregon State University Range Department is conducting studies to determine the effect of stream width/depth/gradient ratio and vegetative shading on stream temperature mechanics.

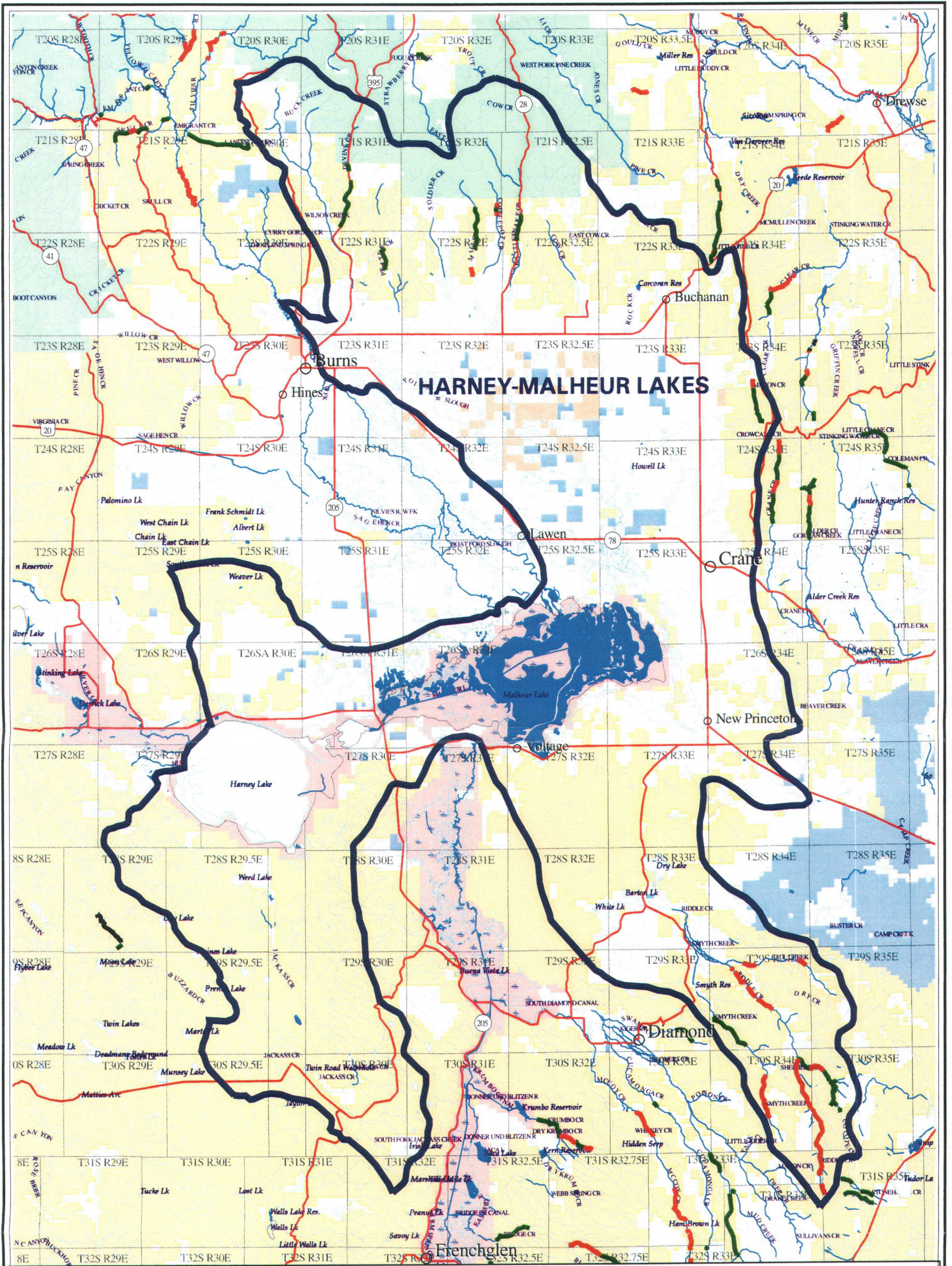
There are five streams in the Harney-Malheur Lakes Sub-basin, totaling 64.1 miles, that have been placed on the 303(d) list (Map 19). Many other streams are likely to be added in the future if the current temperature standard is used.

The streams in the north end of the sub-basin exceeding the temperature parameter are: Mill Creek from the headwaters south to meeting with Coffeepot Creek; Coffeepot

SECTION THREE

Creek from the headwaters south to meeting with Mill Creek, and Rattlesnake Creek from the headwaters of the west fork south to the main fork and continuing south approximately 1.5 miles above U. S. Highway 20. Rattlesnake Creek has one 303(d) in-stream water right for 17.94 acre feet on the first half of the stream reach and an identical amount on the second half of the stream reach.

The two streams in the southeastern corner of the sub-basin exceeding the temperature parameter are: Paul Creek from the headwaters west to meeting with Riddle Creek and, Riddle Creek from the headwaters west to approximately two miles above Dry Lake.

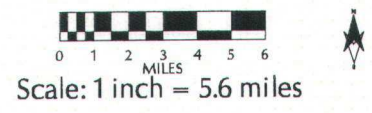


MAP #18 - HARNEY-MALHEUR LAKES SUBBASIN- RIPARIAN CONDITION

Riparian Condition Data for BLM Only.

- Proper Functioning Condition: 19.7 miles within Subbasin.
- Functioning at Risk: 18.7 miles within Subbasin.
- Non-Functioning: None in Subbasin
- Subbasin Boundary
- Major Roads
- Perennial Streams
- Intermittent Streams

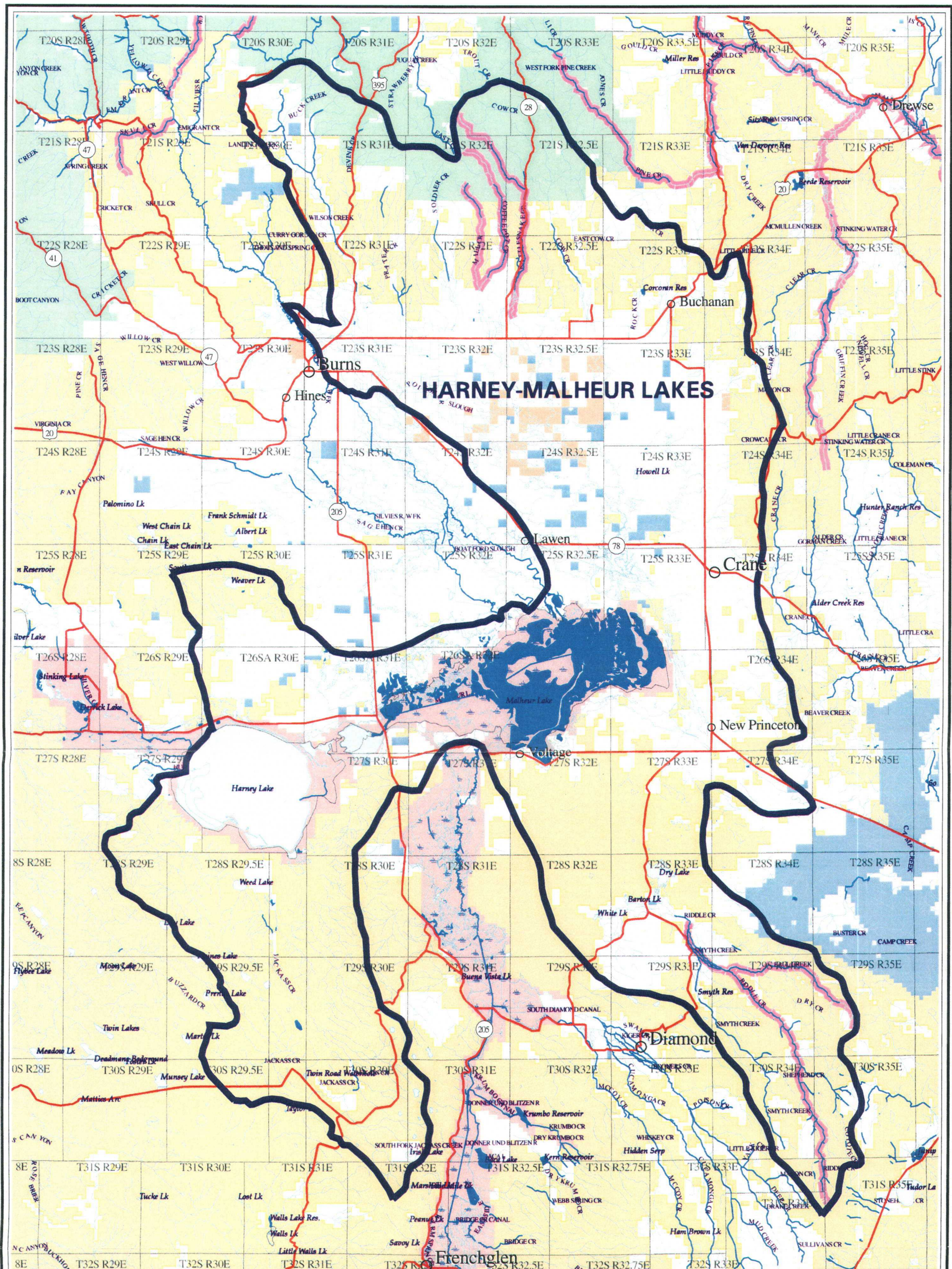
(note that miles are from 100K source; miles from 24K source will be higher)



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MAP #19 - HARNEY-MALHEUR LAKES SUBBASIN - 303D LISTED STREAMS - UPDATED 1998

303D Listed Streams.
Miles in Subbasin: 64.1

- Subbasin Boundary
- Major Roads
- Perennial Streams
- Intermittent Streams

Scale: 1 inch = 5.6 miles



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SECTION FOUR

ISSUES AND RECOMMENDATIONS

These issues and recommendations are not prioritized in any particular order.

Issue 1: Lowering of the water table due to an increase in the number of wells.

Recommendation: Educate the public as to the importance of establishing a database for the location of wells and baselines of seasonal/periodic fluctuations of ground water in those wells. Inventory historic wells.

Issue 2: Carp control.

Recommendation: Continue the development and use of selective carp management.

Issue 3: Weed control.

Recommendation:

- a) Educate the public as to the importance of their input to the existing databases of noxious weed areas.
- b) Recommend the continuance of government assistance for both riparian and upland weed control.
- c) Encourage interagency and private cooperation to increase efficiency in weed control programs.

Issue 4: Ecological balance of native plant communities.

Recommendation: Continue to manage for ecological balance through the density control of conifers, reduction of invasive juniper populations, prescribed burning and other management practices.

Issue 5: Roads density in the Harney-Malheur Sub-basin.

Recommendation: Create an inventory of the roads in the sub-basin and assess their affect on watershed condition.

Issue 6: Riparian condition throughout the sub-basin.

Recommendation: Protect existing aspen stands and other deciduous species. Reintroduce willows, cottonwood, and alder in areas where they have been depleted.

Issue 7: Water retention/stream bank stability.

Recommendation: Utilize the placement of large woody debris and other methods of slowing the rush of water during peak flows.

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Issue 8: Insufficient data exist on stream flows within the basin.

Recommendation: Encourage the collection of data by installing and monitoring gauging stations on both public and private lands.

APPENDICES

APPENDIX A

Following are terrestrial species that occur or have the potential to occur in the Harney-Malheur Lakes Sub-basin.

MAMMALS

COMMON NAME	SCIENTIFIC NAME
badger	<i>Taxidea taxus</i>
beaver	<i>Castor canadensis</i>
Belding's ground squirrel	<i>Spermophilus beldingi</i>
big brown bat	<i>Eptesicus fescus</i>
big freetail bat	<i>Tadarida brasiliensis</i>
black bear	<i>Ursas americanus</i>
black-tailed jackrabbit	<i>Eutamias minimus</i>
bobcat	<i>Felis rufus</i>
bushy-tailed wood rat	<i>Neotoma cinerea</i>
California myotis	<i>Myotis californicus</i>
canyon mouse	<i>Peromyscus crinitus</i>
chickaree	<i>Tamiasciurus douglasi</i>
cougar	<i>Felis concolor</i>
coyote	<i>Canis latrans</i>
dark kangaroo mouse	<i>Microdipodops megacephalus</i>
deer mouse	<i>Peromyscus maniculatus</i>
desert wood rat	<i>Neotoma lepida</i>
fringed myotis	<i>Myotis thysanodes</i>
golden-mantled squirrel	<i>Spermophilus lateralis</i>
Great Basin kangaroo rat	<i>Dipodomys microps</i>
Great Basin pocket mouse	<i>Perognathus parvosi</i>
hairy-winged myotis	<i>Myotis volans</i>
hoary bat	<i>Lasiurus cinereus</i>
house mouse	<i>Mus musculus</i>
least chipmunk	<i>Tamias minimus</i>
little brown myotis	<i>Myotis lucifugus</i>
long-eared myotis	<i>Myotis evotis</i>
long-tailed vole	<i>Microtus longicaudus</i>
long-tailed weasel	<i>Mustela frenata</i>
Merriam's shrew	<i>Sorex merriami</i>
mink	<i>Mustela vison</i>
montane meadow mouse	<i>Microtus montanus</i>
mule deer	<i>Odocoileus hemionus</i>
muskrat	<i>Ondatra zibethicus</i>
northern grasshopper mouse	<i>Onychomys leucogaster</i>
northern pocket gopher	<i>Thomomys talpoides</i>

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Nuttall's cottontail	<i>Sylvilagus nattalii</i>
Ord's kangaroo rat	<i>Dipodomys ordii</i>
pale western big-eared bat	<i>Corynorhinus townsendii</i> <i>pallescens</i>
pallid bat	<i>Antrozous pallidus</i>
porcupine	<i>Erethizon dorsatum</i>
Preble's shrew	<i>Sorex preblei</i>
pronghorn antelope	<i>Antilocapra americana</i>
pygmy rabbit	<i>Sylvilagus idahoensis</i>
raccoon	<i>Procyon lotor</i>
red fox	<i>Vulpes vulpes</i>
Rocky Mountain elk	<i>Cervus canadensis</i>
sagebrush vole	<i>Lagurus curtatus</i>
silver-haired bat	<i>Lasioonycteris noctivagans</i>
small-footed myotis	<i>Myotis ciliolabrum</i>
striped skunk	<i>Mephitis mephitis</i>
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>
Townsend's ground squirrel	<i>Spermophilus townsendii</i>
Townsend's pocket gopher	<i>Thomomys townsendii</i>
vagrant shrew	<i>Sorex vagrans</i>
water shrew	<i>Sorex palustris</i>
western harvest mouse	<i>Reithodontonys megalotis</i>
western jumping mouse	<i>Zapus princeps</i>
western pipistrelle	<i>Pipistrellus Hesperus</i>
western spotted skunk	<i>Spilogale gracilis</i>
white-tailed antelope squirrel	<i>Ammospermophilus leucurus</i>
white-tailed jackrabbit	<i>Lepus townsendii</i>
wild horse	
wolverine	<i>Gulo gulo luseus</i>
yellow pine chipmunk	<i>Tamias townsendii</i>
yellow-bellied marmot	<i>Marmota flaviventris</i>
Yuma myotis	<i>Myotis yumanensis</i>

BIRDS

COMMON NAME	SCIENTIFIC NAME
Loons, Grebes:	
Clark's grebe	<i>Aechmophorus clarkii</i>
common loon	<i>Gavia immer</i>
eared grebe	<i>Podiceps caspicus</i>
horned grebe	<i>Podiceps auritus</i>
pied-billed grebe	<i>Podilymbus podiceps</i>
western grebe	<i>Aechmophorus occidentalis</i>

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Pelicans, Cormorants:	
American white pelican	<i>Pelecanus erythrorhynchos</i>
double-crested cormorant	<i>Phalacrocorax auritus</i>
Bitterns, Herons and Egrets:	
American bittern	<i>Botaurus lentiginosus</i>
black-crowned night heron	<i>Nycticorax nycticorax</i>
cattle egret	<i>Bubulcus coromandus</i>
great blue heron	<i>Ardea herodias</i>
great egret	<i>Ardea alba</i>
least bittern	<i>Ixobrychus exilis</i>
snowy egret	<i>Egretta thula</i>
Storks, Ibis:	
white face ibis	<i>Plegadis chihi</i>
Waterfowl:	
American wigeon	<i>Anas americana</i>
Barrow's goldeneye	<i>Bucephala islandica</i>
blue-winged teal	<i>Anas discors</i>
bufflehead	<i>Bucephala albeola</i>
Canada goose	<i>Branta canadensis</i>
canvasback	<i>Aythya valisneria</i>
cinnamon teal	<i>Anas cyanoptera</i>
common golden eye	<i>Bucephala clangula</i>
common merganser	<i>Mergus merganser</i>
Eurasian wigeon	<i>Anas penelope</i>
gadwall	<i>Anas strepera</i>
greater scaup	<i>Aythya marila</i>
greater white-fronted goose	<i>Anser albifrons</i>
green-winged teal	<i>Anas crecca</i>
harlequin duck	<i>Histrionicus histrionicus</i>
hooded merganser	<i>Lophodytes cucullatus</i>
lesser scaup	<i>Aythya affinis</i>
mallard	<i>Anas platyrhynchos</i>
northern pintail	<i>Anas acuta</i>
northern shoveler	<i>Anas clypeata</i>
redhead	<i>Aythya americana</i>
ring-necked duck	<i>Aythya collaris</i>
Ross' goose	<i>Chen rossii</i>
ruddy duck	<i>Oxyura jamaicensis</i>
snow goose	<i>Chen caerulescens</i>
surf scoter	<i>Melanitta perspicillata</i>
trumpeter swan	<i>Olar buccinator</i>

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tundra swan	<i>Cygnus colubianus</i>
white-fronted goose	<i>Anser albifrons</i>
white-winged scoter	<i>Melanitta deglandi</i>
wood duck	<i>Aix sponsa</i>
Vultures, Hawks and Eagles:	
American kestrel	<i>Falco sparverius</i>
bald eagle	<i>Haliaeetus leucocephalus</i>
Cooper's hawk	<i>Accipiter cooperii</i>
Ferruginous hawk	<i>Buteo regalis</i>
golden eagle	<i>Aquila chrysaetos</i>
northern goshawk	<i>Accipiter gentiles</i>
northern harrier	<i>Circus cyaneus</i>
osprey	<i>Pandion haliaetus</i>
red-shouldered hawk	<i>Buteo lineatus</i>
red-tailed hawk	<i>Buteo jamaicensis</i>
rough-legged hawk	<i>Buteo lagopus</i>
sharp-skinned hawk	<i>Accipiter striatus</i>
Swainson's hawk	<i>Buteo swainsoni</i>
turkey vulture	<i>Cathartes aura</i>
Falcons:	
merlin	<i>Falco columbarius</i>
peregrine falcon	<i>Falco peregrinus anatum</i>
prairie falcon	<i>Falco mexicanus</i>
Grouse, Quail and Pheasants:	
blue grouse	<i>Dendragapus obscurus</i>
California quail	<i>Callipepla californica</i>
chukar	<i>Alectoris chukar</i>
gray partridge	<i>Perdix perdix</i>
greater sage grouse	<i>Centrocercus urophasianus</i>
mountain quail	<i>Oreortyx pictus</i>
ring-necked pheasant	<i>Phasianus colchicus</i>
ruffed grouse	<i>Bonasa umbellus</i>
wild turkey	<i>Meleagris gallopavo</i>
Cranes, Rails and Coots:	
American coot	<i>Fulica Americana</i>
greater sandhill crane	<i>Grus canadensis tabida</i>
lesser Sandhill crane	<i>Grus canadensis</i>
sora	<i>Porzana Carolina</i>
Virginia rail	<i>Rallus limicola</i>

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Shorebirds:	
American avocet	<i>Recurvirostra Americana</i>
Baird's sandpiper	<i>Erolia bairdii</i>
black-bellied plover	<i>Squatarola squatarola</i>
black-necked stilt	<i>Llimantopus mexicanus</i>
common snipe	<i>Gallinago gallinago</i>
dunlin	<i>Calidris alpina</i>
greater yellowlegs	<i>Tringa melanoleuca</i>
killdeer	<i>Charadrius veciferus</i>
least sandpiper	<i>Calidris minutilla</i>
lesser golden plover	<i>Pluvialis dominica</i>
lesser yellowlegs	<i>Tringa flavipes</i>
long-billed curlew	<i>Numenius americanus</i>
long-billed dowitcher	<i>Limnodromus scolopaceus</i>
marbled godwit	<i>Limosa fedoa</i>
red-necked phalarope	<i>Phalaropus lobatus</i>
ruddy turnstone	<i>Arenaria interpres</i>
sanderling	<i>Crocethia alba</i>
semi-palmated plover	<i>Charadrius semipalmatus</i>
snowy plover	<i>Charadrius alexandrinus</i>
solitary sandpiper	<i>Tringa solitaria</i>
spotted sandpiper	<i>Actitis macularia</i>
stilt sandpiper	<i>Micropalama himantopus</i>
western sandpiper	<i>Calidris pusilla</i>
whimbrel	<i>Numenius phaeopus</i>
willet	<i>Catoptrophorus semipalmatus</i>
Wilson's phalarope	<i>Phalaropus tricolor</i>
Gulls and Terns:	
black tern	<i>Chlidonias niger</i>
Bonaparte's gull	<i>Larus philadelphia</i>
California gull	<i>Larus californicus</i>
Caspian tern	<i>Sterna caspia</i>
common tern	<i>Sterna hirundo</i>
Forester's tern	<i>Sterna forsteri</i>
Franklin's gull	<i>Larus pipixcan</i>
herring gull	<i>Larus argentatus</i>
mew gull	<i>Larus canus</i>
ring-billed gull	<i>Larus delawarensis</i>
Pigeons and Doves:	
band-tailed pigeon	<i>Columbia fisciata</i>
mourning dove	<i>Zenaida macroura</i>
rock dove	<i>Columbia livia</i>

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Owls:	
barn owl	<i>Tyto alba</i>
barred owl	<i>Strix varia</i>
burrowing owl	<i>Athene cunicularia</i>
flamulated owl	<i>Otus flammeollus</i>
great gray owl	<i>Strix nebulosa</i>
great horned owl	<i>Bubo virginianus</i>
long-eared owl	<i>Asio otus</i>
n. saw-whet owl	<i>Aegolius acadicus</i>
northern pygmy owl	<i>Glaucidium gnoma</i>
short-eared owl	<i>Asio flammeus</i>
western screech owl	<i>Otus kennicottii</i>
Goatsuckers:	
common nighthawk	<i>Chordeiles acutipennis</i>
common poor-will	<i>Phalaenoptilus nuttallii</i>
Swifts and Hummingbirds:	
black swift	<i>Cypseloides niger</i>
black-chinned hummingbird	<i>Archilochus alexandri</i>
calliope hummingbird	<i>Stellula calliope</i>
rufous hummingbird	<i>Selasphorus rufus</i>
Vaux's swift	<i>Chaetura vauxi</i>
white-throated swift	<i>Aeronautes saxatalis</i>
Kingfishers:	
belted kingfisher	<i>Ceryle alcyon</i>
Woodpeckers:	
black-backed woodpecker	<i>Picoides arcticus</i>
downy woodpecker	<i>Picoides pubescens</i>
hairy woodpecker	<i>Picoides villosus</i>
Lewis' woodpecker	<i>Asyndesmus lewis</i>
northern flicker	<i>Colaptes auratus</i>
pileated woodpecker	<i>Dryocopus pileatus</i>
red-breasted sapsucker	<i>Sphyrapicus ruber</i>
red-naped sapsucker	<i>Sphyrapicus nuchalis</i>
three-toed woodpecker	<i>Picoides tridactylus</i>
white-headed woodpecker	<i>Picoides albolarvatus</i>
Williamson's sapsucker	<i>Sphyrapicus thyroideus</i>
Cuckoos and Roadrunners:	
yellow-billed cuckoo	<i>Coccyzus americanus</i>

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Flycatchers:	
ash-throated flycatcher	<i>Myiarchus cinerascens</i>
cordilleran flycatcher	<i>Empidonax occidentalis</i>
dusky flycatcher	<i>Empidonax oberholseri</i>
eastern kingbird	<i>Tyrannus tyrannus</i>
gray flycatcher	<i>Empidonax wrightii</i>
Hammond's flycatcher	<i>Empidonax hammondii</i>
least flycatcher	<i>Empidonax alnorum</i>
olive-sided flycatcher	<i>Contopus borealis</i>
Pacific slope flycatcher	<i>Empidonax difficilis</i>
Say's phoebe	<i>Sayornis saya</i>
western kingbird	<i>Tyrannus verticalis</i>
western wood pewee	<i>Contopus sordidulus</i>
willow flycatcher	<i>Empidonax traillii</i>
Swallows:	
bank swallow	<i>Riparia riparia</i>
barn swallow	<i>Hirundo rustica</i>
cliff swallow	<i>Petrochelidon pyrrhonota</i>
n. rough-winged swallow	<i>Stelgidopterys serripennis</i>
tree swallow	<i>Tachycineta bicolor</i>
violet-green swallow	<i>Tachycineta thalassina</i>
Larks:	
horned lark	<i>Eremophila alpestris</i>
Jays, Magpies and Crows:	
American crow	<i>Crovis brachyrhynchos</i>
black-billed magpie	<i>Pica pica</i>
bluejay	<i>Cyanocitta cristata</i>
Clark's nutcracker	<i>Nucifraga columbiana</i>
common raven	<i>Corvus corax</i>
gray jay	<i>Perisoreus canadensis</i>
pinyon jay	<i>Gymnorhinus cyanocephalus</i>
scrub jay	<i>Aphelocoma coerulescens</i>
Steller's jay	<i>Cyanocitta stelleri</i>
Chickadees and Nuthatches:	
black-capped chickadee	<i>Parus atricapillus</i>
brown creeper	<i>Certhia familiaris</i>
chestnut-back chickadee	<i>Parus rufescens</i>
mountain chickadee	<i>Parus gambeli</i>
pygmy nuthatch	<i>Sitta pygmaea</i>
red-breasted nuthatch	<i>Sitta canadensis</i>

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white-breasted nuthatch	<i>Sitta carolinensis</i>
Dippers, Bushtits and Wrens:	
American dipper	<i>Cinclus mexicanus</i>
bewick's wren	<i>Thryomanes bewickii</i>
bushtit	<i>Psaltiriparus minimus</i>
canyon wren	<i>Catherpes mexicanus</i>
house wren	<i>Troglodytes aedon</i>
long-billed marsh wren	<i>Telmatodytes palustris</i>
marsh wren	<i>Cistothorus palustris</i>
rock wren	<i>Salpinctes obsoletus</i>
winter wren	<i>Troglodytes troglodytes</i>
Thrashers:	
brown thrasher	<i>Toxostoma rufum</i>
gray catbird	<i>Dumetella carolinensis</i>
northern mockingbird	<i>Mimus polyglottos</i>
sage thrasher	<i>Oreoscoptes montanus</i>
Blackbirds, Meadowlarks and Orioles:	
bobolink	<i>Dolichonyx oryzivorus</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>
brown-headed cowbird	<i>Molothrus ater</i>
great-tailed grackle	<i>Quiscalus mexicanus</i>
hooded oriole	<i>Icterus cucullatus</i>
northern oriole	<i>Icterus galbula</i>
red-winged blackbird	<i>Agelaius phoeniceus</i>
tri-colored blackbird	<i>Agelaius tricolor</i>
western meadowlark	<i>Sturnella neglecta</i>
western tanager	<i>Piranga ludoviciana</i>
yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>
Kinglets, Bluebirds and Thrushes:	
American robin	<i>Turdus migratorius</i>
blue-gray gnat catcher	<i>Polioptila caerulea</i>
golden-crowned kinglet	<i>Regulus calendula</i>
hermit thrush	<i>Catharus guttatus</i>
mountain bluebird	<i>Sialia currucoides</i>
ruby-crowned kinglet	<i>Regulus calendula</i>
Swainson's thrush	<i>Hylocichla ustulata</i>
Townsend's solitaire	<i>Myadestes townsendii</i>
varied thrush	<i>Ixoreus naevius</i>
veery	<i>Catharus fuscescens</i>

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western bluebird	<i>Sialia mexicana</i>
Pipits and Waxwings:	
American pipit	<i>Anthus rubescens</i>
Bohemian waxwing	<i>Bombycilla garrulous</i>
cedar waxwing	<i>Bombycilla cedrorum</i>
Shrikes and Starlings:	
European starling	<i>Sturnus vulgaris</i>
loggerhead shrike	<i>Lanius ludovicianus</i>
northern shrike	<i>Lanius excubitor</i>
Vireos:	
red-eyed vireo	<i>Vireo olivaceus</i>
solitary vireo	<i>Vireo solitarius</i>
warbling vireo	<i>Vireo gilvus</i>
Warblers:	
American redstart	<i>Setophaga picta</i>
bay-breasted warbler	<i>Dendroica castanea</i>
black-and-white warbler	<i>Dendroica striata</i>
blackpoll warbler	<i>Dendroica striata</i>
black-throated blue warbler	<i>Dendroica caerulescens</i>
black-throated gray warbler	<i>Dendroica nigrescens</i>
cape may warbler	<i>Dendroica tigrina</i>
chestnut-sided warbler	<i>Dendroica pensylvanica</i>
common yellowthroat	<i>Geothlypis trichas</i>
hooded warbler	<i>Wilsonia citrina</i>
MacGillivray's warbler	<i>Oporornis tolmiei</i>
magnolia warbler	<i>Dendroica magnolia</i>
Nashville warbler	<i>Vermivora ruficapilla</i>
northern parula	<i>Parula Americana</i>
northern water thrush	<i>Seiurus noveboracensis</i>
orange-crowned warbler	<i>Vermivora celata</i>
ovenbird	<i>Seiurus aurocapillus</i>
Tennessee warbler	<i>Vermivora peregrina</i>
Townsend's warbler	<i>Dendroica townsendii</i>
Wilson's warbler	<i>Wilsonia pusilla</i>
yellow warbler	<i>Dendroica petechia</i>
yellow-breasted chat	<i>Icteria virens</i>
yellow-rumped warbler	<i>Dendroica coronata</i>
Finches:	
American goldfinch	<i>Carduelis tristis</i>

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black-headed grosbeak	<i>Pheucticus melanocephalus</i>
Cassin's finch	<i>Carpodacus cassinii</i>
common redpoll	<i>Acanthis flammea</i>
evening grosbeak	<i>Hesperiphona vespertina</i>
gray-crowned rosy finch	<i>Leucosticte tephrocotis</i>
house finch	<i>Carpodacus mexicanus</i>
Lazuli bunting	<i>Passcrina amoena</i>
lesser goldfinch	<i>Carduelis psaltcia</i>
pine grosbeak	<i>Pinicola enucleator</i>
pine siskin	<i>Spinus pinus</i>
purple finch	<i>Carpodacus purpureus</i>
red crossbill	<i>Loxia curvirostra</i>
rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>
white-winged crossbill	<i>Loxia leucoptera</i>
Towhees and Sparrows:	
American tree sparrow	<i>Spizella passerina</i>
black-throated sparrow	<i>Amphispiza bilineata</i>
Brewer's sparrow	<i>Spizella breweri</i>
chipping sparrow	<i>Spizella passerina</i>
dark-eyed junco	<i>Junco hyemalis</i>
fox sparrow	<i>Passerella iliaca</i>
golden-crowned sparrow	<i>Zonotrichia atricapilla</i>
grasshopper sparrow	<i>Ammodramus savannarum</i>
green-tailed towhee	<i>Pipilo chlorurus</i>
Harris sparrow	<i>Zonotrichia querula</i>
lapland longspur	<i>Calcarius lapponicus</i>
lark sparrow	<i>Chondestes grammacus</i>
Lincoln's sparrow	<i>Melospiza lincolnii</i>
sage sparrow	<i>Amphispiza belli</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
snow bunting	<i>Plectrophenax nivalis</i>
song sparrow	<i>Melospiza melodia</i>
spotted towhee	<i>Pipilo maculatus</i>
vesper sparrow	<i>Pooecetes gramineus</i>
violet-green swallow	<i>Tachycineta thalassina</i>
white-crowned sparrow	<i>Zonotrichia leucophrys</i>
white-throated sparrow	<i>Zonotrichia albicollis</i>
Weaver Finches:	
house sparrow	<i>Paser domesticus</i>

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REPTILES AND AMPHIBIANS

COMMON NAME	SCIENTIFIC NAME
boreal toad	<i>Bufo boreas</i>
Columbia spotted frog	<i>Rana luteiventris</i>
desert horned lizard	<i>Phrynosoma platyrhinos</i>
desert night snake	<i>Hypsiglena torquata</i>
desert striped whip snake	<i>Masticophis taeniatus</i>
e. long-toed salamander	<i>Ambystoma macrodactylum</i>
Great Basin fence lizard	<i>Sceloporus occidentalis</i>
Great Basin gopher snake	<i>Pituophis catenifer</i>
Great Basin spade foot toad	<i>Spea intermontana</i>
Great Basin whiptail	<i>Cnemidophorus tigris</i>
n. side-blotch lizard	<i>Utastans buriana</i>
northern sagebrush lizard	<i>Sceloporus graciosus</i>
Pacific tree frog	<i>Hyla regilla</i>
rubber boa	<i>Charina bottae</i>
sagebrush lizard	<i>Sceloporus graciosus</i>
short-horned lizard	<i>Phrynosoma douglassii</i>
valley garter snake	<i>Thamnophis sirtalis fitchi</i>
w. yellow-bellied racer	<i>Coluber constrictor mormon</i>
wandering garter snake	<i>Thamnophis elegans vagrans</i>
western fence lizard	<i>Sceloporus occidentalis</i>
western rattlesnake	<i>Crotalus viridis</i>
western skink	<i>Eumeces skiltonianus</i>

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APPENDIX B

Plants used by the Burns Paiute Indian Tribe (USFS, 1997)

COMMON NAME	SCIENTIFIC NAME	NORTHERN PAIUTE NAME
bare stem biscuit-root	<i>Lomatium nudicaule</i>	Unknown
beard tongue	<i>Penstemon spp.</i>	Namogot
big sagebrush	<i>Artemesia tridentate</i>	Sah wabi
big-head clover	<i>Trifolium macrocephalum</i>	Poziidapy
bitterroot	<i>Lewisia rediviva</i>	Kanicy
camas	<i>Camassia quamash</i>	Paazigo
Canby's biscuit-root	<i>Lomatium canbyi</i>	Canacuka
chokecherry	<i>Prunus virginiana</i>	Toosia bui
cous biscuit-root	<i>Lomatium cous</i>	Cuka
field mint	<i>Mentha arvensis</i>	Pakwana
Gairdner's yampah	<i>Perideridia bolanderi</i>	Yapa, yampa, payapa
German's biscuit-root	<i>Lomatium gotmanii</i>	Kwidapoo
golden currant	<i>Ribes aureum</i>	Poko pisa
juniper	<i>Juniperus occidentalis</i>	Waa pi
large-fruit biscuit-root	<i>Lomatium macrocarpum</i>	Haapi
Oregon yampah	<i>Perideridia oregana</i>	Pamahayapa
ponderosa pine	<i>Pinus ponderosa</i>	Ti bi
sagebrush mariposa lily	<i>Calochortus macrocarus</i>	Koogi
swamp onion	<i>Allium madicum</i>	Sii
taper-tip onion	<i>Allium acuminatum</i>	Kyyga
wormwood/prairie sagewort	<i>Artemesia frigida</i>	Na te zoowa
yarrow	<i>Achillea millefolium</i>	Waa da qusi
yellow bell	<i>Fritillaria pudica</i>	Winida

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APPENDIX C

Fish species of the Harney-Malheur Lakes Sub-Basin.

NATIVE FISH

COMMON NAME	SCIENTIFIC NAME
bridge lip sucker	<i>Catostomus columbianus</i>
chisel mouth	<i>Acrocheilus alutaceus</i>
largescale sucker	<i>Catostomus macrocheilus</i>
longnose dace	<i>Rhinichthys cataractae</i>
Malheur-mottled sculpin	<i>Cottus bairdi bairdi</i>
mottled sculpin	<i>Cottus bairdi</i>
northern squawfish	<i>Ptychocheilus oregonensis</i>
redband trout	<i>Oncorhynchus mykiss newberii</i>
redsided shiner	<i>Richardsonius balteatus</i>
speckled dace	<i>Rhinichthys asculus</i>

NON-NATIVE FISH

COMMON NAME	SCIENTIFIC NAME
bluegill	<i>Lepomis macrochirus</i>
brook trout	<i>Salvelinus fontinalis</i>
brown bullhead	<i>Ictalurus nebulosus</i>
common carp	<i>Cyprinus carpio</i>
largemouth bass	<i>Micropterus salmoides</i>
pumpkinseed	<i>Lepomis gibbosus</i>
rainbow trout	<i>Oncorhynchus mykiss</i>
smallmouth bass	<i>Micropterus dolomieu</i>
white crappie	<i>Pomoxis annularis</i>
yellow perch	<i>Perca flavescens</i>

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APPENDIX D

HARNEY COUNTY NOXIOUS WEEDS

A-Rated Weeds

(Infestations Are Subject to Eradication Where Found)

COMMON NAME	SCIENTIFIC NAME
black henbane	<i>Hyoscyamus niger</i>
diffuse knapweed	<i>Centaurea diffusa</i>
leafy spurge	<i>Euphorbia esula</i>
musk thistle	<i>Cardus nutans</i>
purple loosestrife	<i>Lythrum salicaria</i>
rush skeletonweed	<i>Ghondrilla juncea</i>
salt cedar	<i>Tamarix ramosissima</i>
scotch broom	<i>Cytisus scoparius</i>
spotted knapweed	<i>Centaurea maculosa</i>
squarrose knapweed	<i>Centaurea virgata</i>
tansy ragwort	<i>Senecio jacobaea</i>
yellow star thistle	<i>Centaurea solstitialis</i>
yellow toadflax	<i>Linaria vulgaris</i>

B-Rated Weeds

(Infestations Are Handled at County Discretion)

COMMON NAME	SCIENTIFIC NAME
dalmatian toadflax	<i>Linaria dalmatica</i>
Mediterranean sage	<i>Salvia aethiopis</i>
medusahead rye	<i>Taeniatherum caput-medusa</i>
perennial pepperweed	<i>Lepidium latifolium</i>
puncture vine	<i>Tribulus terrestris</i>
Russian knapweed	<i>Centaurea repens</i>
scotch thistle	<i>Onopordum acanthium</i>

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C-Rated Weeds (Infestations Are Handled at Landowner's Discretion)

COMMON NAME	SCIENTIFIC NAME
Canada thistle	<i>Cirsium arvense</i>
halogeton	<i>Halogeton spp.</i>
morning glory	<i>Convolvulus arvensis</i>
St. John's Wort (Klamath Weed)	<i>Hypericum perforatum</i>
white top	<i>Cardaria draba</i>

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APPENDIX E

Proper Functioning Condition (PFC) Information for Streams in Malheur-Harney Lake Sub-basin (BLM-Administered Stream Miles* Only)

Stream Name	Proper Functioning Condition	Functioning at Risk (Upward Trend)	Functioning at Risk (Downward Trend)	Functioning at Risk (Trend Not Apparent)	Non- Functioning
Mahon Creek	2.67	0.60			
Mill Creek	2.90	0.60			0.60
Paul Creek		1.33			
Rattlesnake Creek	2.67				
Riddle Creek	0.38	2.67		5.88	
Smyth Creek	2.86	2.86			
Prather Creek	1.52				
Coffeepot Creek	0.38		0.50		
Coyote Creek	4.20	1.00			
Devine Creek	4.19				

*PFC for stream miles on Malheur National Forest is not available as of May, 2001. No PFC for private land miles have been completed as of May, 2001.

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APPENDIX F

List of Recorded Wells in Harney-Malheur Lakes Sub-basin

Township	Range	No. of Water Wells
20 S	30 E	0
	31 E	1
	32 E	0
	33 E	0
21 S	30 E	0
	31 E	1
	32 E	0
	32.5 E	0
22 S	33 E	1
	30 E	0
	31 E	71
	32 E	50
	32.5 E	35
23 S	33 E	21
	34 E	1
	31 E	123
	32 E	106
	32.5 E	67
	33 E	68
24 S	34 E	31
	32 E	36
	32.5 E	29
	33 E	107
25 S	34 E	25
	29 E	0
	30 E	17
	31 E	0
	32 E	6
	32.5 E	17
26 S	33 E	39
	34 E	69
	30 E	37
	31 E	41
	32 E	13
27 S	33 E	37
	34 E	32
	29 E	2
	29.5 E	0
	30 E	15
	31 E	2
	32 E	5
	33 E	15
28 S	34 E	23
	29 E	0
	29.5 E	5

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	29.75 E	1
	30 E	2
	32 E	1
	33 E	10
	34 E	3
29 S	29.5 E	0
	29.75 E	0
	30 E	0
	32 E	0
	33 E	3
	34 E	1
30 S	29.5 E	0
	29.75 E	0
	30 E	4
	31 E	0
	34 E	0
	35 E	0
31 S	32 E	0
	34 E	0
	35 E	0
	TOTAL WELLS:	1,173

NOTE: List does not include any wells not filed with the Oregon Department of Water Resources and found in the Department's internet web site as of April 24, 2001. No monitoring or geologic wells are listed. No differentiation made between domestic and irrigation wells or wells in use or non-use.

GLOSSARY

Alluvial/Alluvium: Sand, clay, etc. deposited by flowing water, especially in a stream bed.

Aquifer: Water-bearing rock or stratum.

Cloning: Producing plants which are directly descended from a single individual as by shoots, budding or grafting.

Evapotranspiration: The release and movement of moisture through evaporation from water and soil surfaces, and loss from living vegetation.

Forb: Broad-leafed flowering plants as distinguished from grasses, sedges, etc.

Functional at Risk: Riparian-wetland areas that are in functional condition but an existing soil, water, or vegetation attribute makes them susceptible to degradation. (USDI Bureau of Land Management, 1995) An upward trend signifies that conditions are improving and moving towards PFC. A downward trend implies that conditions are worsening.

Hydroponic: Science of growing plants in solutions containing the necessary minerals instead of soil.

Lacustrine: Of or found in or on lakes.

Lenticular: Shaped like a lentil or double-convex lens.

Linear Aquifer: Water-bearing rock or stratum consolidated and extended in length from point-to-point; may be straight or serpentine.

Non-functional: Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows and thus are not reducing erosion, improving water quality, etc., as listed above. The absence of certain physical attributes such as floodplain where one should be are indicators of non-functioning conditions. (USDI Bureau of Land Management, 1995)

Pleistocene: Geologic time period characterized by the rise and receding of continental ice sheets; appearance of early man, epoch of time is 50,000 to 1,000,000 years ago.

Pliocene: Geologic time period during which plants and animals developed; epoch of time is 1,000,000 to 12,000,000 years ago.

Proper Functioning Condition (PFC): Riparian-wetland areas are functioning properly when adequate vegetation, land form, or large woody debris is present to dissipate stream energy associated with high water flows, thereby reducing erosion and

GLOSSARY

improving water quality; filter sediment, capture bed load, and aid floodplain development; improve flood-water retention and ground-water recharge; develop root masses that stabilize stream banks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding and other uses; and support greater biodiversity. The functioning condition of riparian-wetland areas is a result of interaction among geology, soil, water and vegetation. (USDI Bureau of Land Management, 1995)

Pyroclastic: Made up of rock material broken into fragments through volcanic or igneous action.

Riparian: Of, relating to, or living on the banks of a stream, lake, etc.

Sedimentary: Any rock or mass deposited by wind or water.

Tertiary: Geologic era composed of the Pleistocene (latest), Pliocene, Miocene, Oligocene, Eocene and Paleocene (earliest) epochs; era spans 12,000,000 to 60,000,000 years ago.

Tuff: Porous rock, usually stratified and formed by the consolidation of volcanic ash, dust, sand, etc. which are adhered together to form a solid mass.

Welded Tuff: A glass-rich volcanic rock that has been solidified by the welding of its glass shards through an action of heat and hot gas.

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