

## Deschutes Basin

### Description

The Deschutes River drains over 10,000 square miles, making its basin one of the largest in Oregon. The terrain of the basin varies markedly, from the east slope of the Cascades and the western edge of the Ochoco Mountains to the Deschutes Valley and the high plateau between the Deschutes and John Day rivers. The climate of the basin is slightly influenced by the Pacific Ocean, making it a little warmer, and a little moister, than most other east side drainages.

The Deschutes Basin straddles parts of three different ecoregions – the Columbia Basin, East Cascades and the Blue Mountains. Its vegetation is as varied as its climate and elevation, and many ecological systems are represented here. On the west side of the basin, coming down from the crest of the Cascades, the slopes are covered by conifer forests. To the east, in the Blue Mountains ecoregion, Western juniper is dominant. Prior to European settlement, basin big sagebrush, native grasslands and riparian woodlands were also widespread in this area. Today, irrigated agriculture occupies most of the valley bottoms and plains, while juniper has spread into many former shrub-steppe vegetation types. About half the basin is in public ownership.

The Deschutes River itself, fed by snowfields in the Cascades, flows through high-elevation wet meadows and lava plains before dropping through scenic canyons and shrub steppe to join the Columbia. The Deschutes supports one of the few remaining wild spring chinook populations in the Columbia Basin, as well as fall chinook and summer steelhead. Bull trout and steelhead are listed under the federal Endangered Species Act.

Conservation issues in the Deschutes Basin include habitat loss and fragmentation due to rapid population growth and urban development around Bend, Redmond and Madras, and to recreational development in both these and outlying areas. In the eastern part of the basin, concerns include loss of grasslands and shrub steppe due to juniper invasion, agricultural development, the spread of exotic plant species, historic livestock management practices, and reduced fire frequency. Loss and degradation of wetland and riparian habitats is a concern throughout the basin.

Acquisition priorities in the Deschutes reflect these issues and the current pattern of land ownership in the basin. Included are relatively rare and/or degraded ecological system types adversely affected by development pressures and not well-represented on public lands, such as oak woodlands. Also included are many riparian and wetland habitats.

Of note is the inclusion of old growth western juniper as a priority. In general, western juniper has become a problem species in the basin, but the scattered remnants of healthy old growth juniper woodlands are important for a number of wildlife species, and little of this particular type of juniper habitat is currently protected on public lands.

Also of note is the exclusion of Ponderosa pine systems as an acquisition priority in this basin. While Ponderosa pine woodlands have declined significantly from historic levels in the Deschutes, most remaining stands are found on public lands.

Projects that address important systems and species and also provide for flow improvements in the Upper Deschutes and Crooked River systems would have particularly high ecological benefit in this basin. Similar to other east side basins, peak flows in the Deschutes occur in the spring and lowest flows (and highest demand) in late summer. The upper Deschutes has been fully appropriated since 1913; a volume representing about one-third of the consumptive water rights issued in the basin is diverted from the Deschutes near Bend. The most even flows in the basin are found in the Metolius drainage, and the greatest variability is found in Crooked River flows (another third of the volume of consumptive water rights issued in the basin is diverted from the Crooked River). The lower Deschutes, fed by springs originating as snowmelt in the upper basin, is characterized by more uniform flows.

#### Priority Ecological Systems

- Alkaline wetlands
- Aspen forest and wetland
- Black greasewood
- Deciduous swamp
- Foothill and lower montane riparian woodland
- Freshwater emergent marsh
- Lowland riparian woodland and shrubland
- Montane riparian forest and shrubland
- Oak woodland
- Palouse prairie grassland
- Rigid sage, bluegrass and buckwheat scablands
- Subalpine or montane wet meadow
- Western juniper woodland (old growth only)
- Xeric mixed sagebrush shrubland

#### Rare or At-Risk Plant Communities

- Basin big sagebrush / basin wildrye
- Basin big sagebrush / Sandberg bluegrass - bluebunch wheatgrass Palouse
- Basin wildrye bottomlands
- Bitterbrush / Idaho fescue - (bluebunch wheatgrass)
- Bitterbrush / Sandberg bluegrass
- Black cottonwood - white alder
- Black cottonwood / black hawthorn
- Black cottonwood / coyote willow
- Black cottonwood / Pacific willow riparian
- Black hawthorn - Woods rose
- Bluebunch wheatgrass - Idaho fescue palouse

Bluebunch wheatgrass - Sandberg bluegrass Palouse  
Chokecherry  
Douglas-fir / common snowberry / Hawkweed  
Douglas-fir / mountain mahogany  
Douglas-fir / western fescue  
Grand fir - western red cedar / vanillaleaf  
Grand fir / golden chinquapin  
Idaho fescue - (common snowberry)  
Idaho fescue - (houndstongue hawkweed)  
Mockorange  
Mountain alder - western birch  
Ponderosa pine - Oregon white oak / arrowleaf balsamroot  
Ponderosa pine / blue wildrye  
Ponderosa pine / low sagebrush  
Ponderosa pine / woolly wyethia  
Quaking aspen / aquatic sedge  
Sand dropseed  
Sculer willow riparian  
Shrubby cinquefoil / tufted hairgrass meadow  
Silver sagebrush / Nevada bluegrass  
Western birch - mockorange  
Western juniper / curlleaf mountain mahogany / elk sedge  
White alder / chokecherry  
White alder / hackberry  
White alder / mockorange  
White alder / serviceberry  
White alder / water birch  
White alder / woods rose  
White oak / blue wildrye  
White oak / bluebunch wheatgrass  
White oak / poison oak / blue wildrye  
Wyoming big sagebrush / needle-and-thread  
White alder / hackberry  
White alder / mockorange  
White alder / serviceberry  
White alder / water birch  
White alder / woods rose  
White oak / blue wildrye  
White oak / bluebunch wheatgrass  
White oak / poison oak / blue wildrye

DRAFT - Deschutes Basin - Priority Species

<i>Fish</i>	<i>Birds</i>	<i>Mammals</i>	<i>Amphibians and Reptiles</i>	<i>Invertebrates</i>	<i>Plants</i>
Inland Rainbow Trout Pacific Lamprey Steelhead (Middle Columbia Winter Run and Lower Columbia Winter and Summer Run)	Ash-Throated Flycatcher Golden Eagle (nest sites only) Greater Sage Grouse Lewis's Woodpecker Loggerhead Shrike Long-Eared Owl (natural nest sites only) Pinyon Jay Townsend's Solitaire Yellow-Headed Blackbird	Pallid Bat Pygmy Rabbit Spotted Bat Townsend's Big-Eared Bat Western Gray Squirrel White-Tailed Jackrabbit	Columbia Spotted Frog Oregon Spotted Frog Striped Whipsnake Western Toad	<i>Anodonta californiensis</i> (California Floater) <i>Fisherola nuttalli</i> (Shortface Lanx) <i>Juga bulbosa</i> (Bulb Juga) <i>Juga hemphill Maupinensis</i> (Purple-Lipped (Deschutes) Juga) <i>Juga hemphill</i> ssp. nov. (Indian Ford Juga) <i>Juga</i> sp. nov. (Crooked River Juga) <i>Juga</i> sp. nov. (Purple Juga) <i>Monadenia fidelis</i> ssp. nov. (Deschutes Sideband Snail) <i>Monadensia fidelis minor</i> (Dalles Sideband Snail) <i>Orehelix variabilis</i> ssp. nov. (Deschutes Mountainsnail) <i>Oreohelix variabilis variabilis</i> (Dalles Mountainsnail) <i>Satyrrium sylvinum</i> (Sylvan Hairstreak)	<i>Astragalus tygensis</i> (Tygh Valley Milkvetch)

Deschutes Basin Priority Ecological Systems								
Ecological System Name	Existing (Ha)	Historic (Ha)	Protected (Ha)	Private (Ha)	% Loss (+/- =gain/loss)	% Public	Index	Comments
Palouse Prairie Grassland		16143.30			-100.0%	0.0%	-99.99	May no longer exist in basin
Alkaline Wetlands		257.13			-99.6%	0.0%	-99.61	May no longer exist in basin
Xeric Mixed Sagebrush Shrubland	1032.30	19971.09	327.78	209.97	-94.8%	79.6%	-63.10	Very large declines outweighs high representation on public land
Foothill and Lower Montane Riparian Woodland	533.52	1121.85	24.21	415.98	-52.4%	22.0%	-47.87	Wetland / Riparian priority not well mapped
Rigid Sage, Bluegrass, and Buckwheat Scablands	5828.22	10594.08	86.49	5157.54	-45.0%	11.5%	-43.50	
Black Greasewood	130.95	223.20	24.48	92.52	-41.1%	29.1%	-22.59	
Subalpine or Montane Wet Meadow	835.56	1079.10	236.79	491.49	-22.5%	41.1%	5.76	Wetland / Riparian priority not well mapped
Western Juniper Woodland	86654.34	65441.25	6890.76	43450.74	32.4%	49.9%	40.37	Only included as Old-Growth Juniper
Aspen Forest and Woodland	96.03		2.79	54.54	9603.0%	42.8%	9605.88	Riparian priority not well mapped - occurs as wetlands on public lands
Lowland Riparian Woodland and Shrubland	99.90		1.26	97.56	9990.0%	2.3%	9991.25	Wetland / Riparian priority not well mapped
Freshwater Emergent Marsh	284.49		1.80	272.16	28449.0%	4.3%	28449.63	Wetland / Riparian priority not well mapped
Oak Woodland	1606.23	331.74	76.5	1151.55	383.03%	28.29%	387.79	Increasing, but statewide priority
Deciduous Swamp								Wetland / Riparian priority unmapped
Montane Riparian Forest and Shrubland								Wetland / Riparian priority, may be too common on public lands

**Deschutes Priority Species**

Common Name	Scientific Name	Lists on Which Species Appears	Rationale for Identifying as Priority	Additional Comments
<b>BIRDS</b>				
Ash-throated Flycatcher		BCR priority, GAP priority, PIF focal species	Significant population declines; good opportunity for conservation of private land oak habitats and old juniper trees for nesting	
Golden Eagle (nest sites only)		TNC ecoregional target	Regionally declining species; subject to habitat loss and disturbance from urban sprawl and recreation; 25% of known nests on private lands good opportunity for conservation on private lands where cliff habitat occurs because of lack of value of this habitat	
Greater Sage-Grouse		BCR priority, GAP priority, TNC ecoregional target, PIF focal species	State Sensitive; historic range reductions; good opportunities to conserve degraded and good condition private lands, especially in se part of basin within checkerboard public ownership to connect conservation areas for this wide ranging species	
Lewis's Woodpecker		BCR priority, TNC ecoregional target, PIF focal species	State Sensitive; highly significant population declines in OR; local extirpations; good opportunity for conservation of private land oak and oak-pine forest and open pine at lower elevations	
Loggerhead Shrike		BCR priority, TNC ecoregional target, PIF focal species	State Sensitive; highly significant population declines in OR and rangewide; good opportunity for conservation of private open grassy rangelands with scattered shrubs/trees, especially old juniper	
Long-eared Owl (natural nest sites only)		TNC ecoregional target	Unknown status, but good opportunity for conservation of private lands with dense riparian woodlands	
Pinyon Jay		BCR priority, GAP priority	and older juniper at interface of ppine zone to connect conservation areas	
Townsend's Solitaire		BCR priority, TNC ecoregional target	Good opportunity for conservation of private inholdings and sites at interface of public lands with old juniper trees significant population declines	
Yellow-headed Blackbird		GAP priority, TNC ecoregional target	Scattered breeding populations in basin; good species to emphasize because of association with high quality wetlands with cattails and good opportunities for conservation of these wetlands because of their limited agricultural productivity	
<b>MAMMALS</b>				
Pallid bat		TNC ecoregional target	Roosting habitat (caves, mines) is limited	
Pygmy rabbit		TNC ecoregional target	Declining	
Spotted bat		GAP priority; TNC ecoregional target	Rare in Oregon, recently found at several sites in basin	
Townsend's big-eared bat		TNC ecoregional target	Roosting habitat (caves, mines) is limited	
Western gray squirrel		GAP priority; TNC ecoregional target	Declining; oak/pine habitat	
White-tailed jackrabbit		GAP priority	Declining; grassland habitat diminished and degraded	
<b>HERPS</b>				
Columbia spotted frog		TNC ecoregional target; Federal candidate	Declining with local extirpations	
Oregon spotted frog		TNC ecoregional target; Federal candidate	Declining with local extirpations	
Striped whipsnake		GAP priority; TNC ecoregional target	Northwestern edge of range; canyon shrubland habitats	
Western toad		TNC ecoregional target	Declining with local extirpations	
<b>FISH</b>				
Inland redband trout		Federally Threatened; State Critical; TNC Ecoregional Target Species	Declining	
Pacific lamprey		TNC ecoregional target	Declining - habitat degradation	
Steelhead, Middle Columbia River ESU		TNC Ecoregional Target Species	Declining	
<b>INVERTEBRATES</b>				
California floater	<i>Anodonta californiensis</i>	TNC ecoregional target	Declining with local extirpations	
shortface lanx	<i>Fisherola nuttalli</i>	ORNHIC priority (high ranked); TNC ecoregional target	One of few basins left to capture species	
bulb juga	<i>Juga bulbosa</i>	ORNHIC priority (high ranked); TNC ecoregional target	Only basin to capture this rare and declining taxon	
purple-lipped (=Deschutes) juga	<i>Juga hemphilli maupinensis</i>	ORNHIC priority (high ranked); TNC ecoregional target	Only basin to capture this rare and declining taxon	
Indian Ford juga	<i>Juga hemphilli ssp. nov.</i>	ORNHIC Priority (high ranked)	Only basin to capture this rare and declining taxon	
Crooked River juga	<i>Juga sp. nov.</i>	ORNHIC Priority (high ranked)	Only basin to capture this rare and declining taxon	
purple juga	<i>Juga sp. nov.</i>	ORNHIC Priority (high ranked)	Only basin to capture this rare and declining taxon	
Dalles sideband	<i>Monadenia fidelis minor</i>	ORNHIC priority (high ranked); TNC ecoregional target	One of few basins to capture rare and declining taxon	
Deschutes sideband	<i>Monadenia fidelis ssp. nov.</i>	ORNHIC priority (high ranked)	Only basin to capture this rare and declining taxon	
Dalles mountainsnail	<i>Oreohelix variabilis variabilis</i>	ORNHIC priority (high ranked); TNC ecoregional target	One of few basins to capture rare and declining taxon	
Deschutes mountainsnail	<i>Oreohelix variabilis ssp. nov.</i>	ORNHIC priority (high ranked)	Only basin to capture this rare and declining taxon	
sylvan hairstreak	<i>Satyrrium sylvinum</i>	TNC ecoregional target	Requires riparian/wetland habitats	
<b>PLANTS</b>				
Tygh Valley milk-vetch	<i>Astragalus tyghensis</i>	State Listed	G1-G2 and state listed	

### Deschutes Basin Priority Ecological System Analysis

Ecological System Name	Existing (Ha)	Historic (Ha)	Protected (Ha)	Private (Ha)	% Loss (+/- =gain/loss)	% Public	Index	Reason for Excluding as Priority System in Basin
Palouse Prairie Grassland		16143.30			-100.0%	0.0%	-99.99	
Alkaline Wetlands		257.13			-99.6%	0.0%	-99.61	
Chaparral	2.25	233.55		0.27	-98.6%	60.9%	-98.61	Not an important type in basin, important further south
Semi-Desert Shrub Steppe	3842.82	23411.34	37.44	1281.24	-83.6%	66.6%	-82.61	
Xeric Mixed Sagebrush Shrubland	1032.30	19971.09	327.78	209.97	-94.8%	79.6%	-63.10	
Big Sagebrush Steppe	45887.76	101491.74	2227.86	25277.85	-54.8%	44.9%	-49.93	Best Represented in Closed and other basins
Foothill and Lower Montane Riparian Woodland	533.52	1121.85	24.21	415.98	-52.4%	22.0%	-47.87	
Rigid sage, Bluegrass, and Buckwheat Scablands	5828.22	10594.08	86.49	5157.54	-45.0%	11.5%	-43.50	
Lodgepole Pine Forest and Woodland	25281.09	42732.36	4268.07	3528.09	-40.8%	86.0%	-23.96	Best Conserved on Public Land
Black Greasewood	130.95	223.20	24.48	92.52	-41.1%	29.1%	-22.59	
Ponderosa Pine Woodland	89187.12	123490.53	8244.72	33278.67	-27.8%	62.7%	-18.53	Best Conserved on Public Land
Low, Black and Early Sagebrush Steppe	15336.99	16033.05	107.19	8590.68	-4.3%	44.0%	-3.64	Better Represented in Closed and other basins, and best protected on Public Land
Subalpine or Montane Wet Meadow	835.56	1079.10	236.79	491.49	-22.5%	41.1%	5.76	
Eastern Oregon Grand Fir Forest and Woodland	2952.09	2596.05	378.18	329.04	13.7%	88.8%	26.52	Best Represented elsewhere and mostly on public land
Subalpine Fir - Englemann Spruce Forest	2603.97	5376.96	2104.11	186.12	-51.6%	92.8%	29.21	Best Represented elsewhere and mostly on public land
Western Juniper Woodland	86654.34	65441.25	6890.76	43450.74	32.4%	49.9%	40.37	Only included as Old-Growth Juniper
Alpine	1265.40	1685.97	1131.75	131.76	-24.9%	89.5%	64.44	Best Represented elsewhere and mostly on public land
Ice Field	276.03	274.77	196.65	79.38	0.5%	71.0%	71.44	Not a meaningful type
Bare Rock, Lava Flows and Cinder	2079.63	1795.50	1178.55	60.39	15.8%	97.0%	72.46	Not a meaningful type
Shasta Red Fir Forest	6147.27	4693.50	3030.66	477.63	31.0%	92.2%	80.26	Best Represented elsewhere and mostly on public land
Water	3629.07	2172.15	494.37	2558.61	67.0%	29.5%	80.66	Not a meaningful type
Mountain Hemlock Forest	16949.07	13020.12	13794.84	1242.54	30.2%	92.7%	111.56	Best Represented elsewhere and mostly on public land
Douglas-fir and Madrone Forest and Woodland	3534.93	1779.84	1394.82	1245.78	98.6%	64.7%	138.00	Mostly on Public Land and increasing
Mountain Big Sagebrush	25237.71	9765.36	541.44	9880.65	158.4%	60.8%	160.57	Best Represented elsewhere and mostly on public land
Western Hemlock-Douglas fir dry	7248.87	2656.53	2159.37	3105.72	172.8%	57.1%	202.59	Best Represented elsewhere and mostly on public land
Foothill and Canyon Dry Grassland	58555.35	15670.35	2599.83	37611.72	273.7%	35.8%	278.09	Well Protected and not at risk
Oak Woodland	1606.23	331.74	76.50	1151.55	383.0%	28.3%	387.79	Increasing with fire suppression, better protected elsewhere
Eastern Oregon Douglas-fir Forest and Woodland	33546.33	5919.75	3861.00	15343.02	466.6%	54.3%	478.12	Not a meaningful type
Burn	15.84		6.48		1584.0%	94.1%	1622.48	Not a meaningful type
Subalpine and Montane Pine Woodland	38.34		18.09	0.99	3834.0%	94.9%	3879.98	Public Land



## Deschutes Basin Priority Rare Communities

Scientific name	Common name
<i>Artemisia tridentata</i> ssp. <i>tridentata</i> / <i>Leymus cinereus</i>	basin big sagebrush / basin wildrye
<i>Artemisia tridentata</i> ssp. <i>tridentata</i> / <i>Poa secunda</i> - <i>Pseudoroegneria spicata</i>	basin big sagebrush / Sandberg bluegrass - bluebunch wheatgrass Palouse
<i>Leymus cinereus</i>	basin wildrye bottomlands
<i>Purshia tridentata</i> / <i>Festuca idahoensis</i> - ( <i>Pseudoroegneria spicata</i> )	bitterbrush / Idaho fescue - (bluebunch wheatgrass)
<i>Purshia tridentata</i> / <i>Poa secunda</i>	bitterbrush / Sandberg bluegrass
<i>Populus balsamifera</i> ssp. <i>trichocarpa</i> - <i>Alnus rhombifolia</i>	black cottonwood - white alder
<i>Populus balsamifera</i> ssp. <i>trichocarpa</i> / <i>Crataegus douglasii</i>	black cottonwood / black hawthorn
<i>Populus balsamifera</i> ssp. <i>trichocarpa</i> / <i>Salix exigua</i>	black cottonwood / coyote willow
<i>Populus balsamifera</i> ssp. <i>trichocarpa</i> / <i>Salix lucida</i> ssp. <i>caudata</i>	black cottonwood / Pacific willow riparian
<i>Crataegus douglasii</i> - <i>Rosa woodsii</i>	black hawthorn - Woods rose
<i>Pseudoroegneria spicata</i> - <i>Festuca idahoensis</i> palouse	bluebunch wheatgrass - Idaho fescue palouse
<i>Pseudoroegneria spicata</i> - <i>Poa secunda</i> Palouse	bluebunch wheatgrass - Sandberg bluegrass Palouse
<i>Prunus virginiana</i>	chokecherry
<i>Festuca idahoensis</i> - ( <i>Symphoricarpos albus</i> )	Idaho fescue - (common snowberry)
<i>Festuca idahoensis</i> - ( <i>Hieraceum cynoglossoides</i> )	Idaho fescue - (houndstongue hawkweed)
<i>Philadelphus lewisii</i>	mockorange
<i>Alnus incana</i> - <i>Betula occidentalis</i>	mountain alder - western birch
<i>Pinus ponderosa</i> - <i>Quercus garryana</i> / <i>Balsamorhiza sagittata</i>	ponderosa pine - Oregon white oak / arrowleaf balsamroot
<i>Pinus ponderosa</i> / <i>Elymus glaucus</i>	ponderosa pine / blue wildrye
<i>Pinus ponderosa</i> / <i>Artemisia arbuscula</i>	ponderosa pine / low sagebrush
<i>Pinus ponderosa</i> / <i>Wyethia mollis</i>	ponderosa pine / woolly wyethia
<i>Salix scouleriana</i>	Scouler willow riparian
<i>Potentilla fruticosa</i> / <i>Deschampsia cespitosa</i>	shrubby cinquefoil / tufted hairgrass meadow
<i>Betula occidentalis</i> - <i>Philadelphus lewisii</i>	western birch - mockorange
<i>Alnus rhombifolia</i> / <i>Prunus virginiana</i>	white alder / chokecherry
<i>Alnus rhombifolia</i> / <i>Celtis laevigata</i> var. <i>reticulata</i>	white alder / hackberry
<i>Alnus rhombifolia</i> / <i>Philadelphus lewisii</i>	white alder / mockorange
<i>Alnus rhombifolia</i> / <i>Amelanchier alnifolia</i>	white alder / serviceberry
<i>Alnus rhombifolia</i> / <i>Betula occidentalis</i>	white alder / water birch
<i>Alnus rhombifolia</i> / <i>Rosa woodsii</i>	white alder / woods rose
<i>Quercus garryana</i> / <i>Elymus glaucus</i>	white oak / blue wildrye
<i>Quercus garryana</i> / <i>Pseudoregnaria spicata</i>	white oak / bluebunch wheatgrass
<i>Quercus garryana</i> / <i>Toxicodendron diversilobum</i> / <i>Elymus glaucus</i>	white oak / poison oak / blue wildrye