Attachment A

Scientific Names of Species Identified in this Report

Common Name	Scientific Name
Amphibians	
American Bullfrog	*Lithobates catesbeianus*
Long-toed Salamander	*Ambystoma macrodactylum*
Northern Red-legged Frog	*Rana aurora*
Northwestern Salamander	*Ambystoma gracile*
Pacific Treefrog	*Pseudacris regilla*
Western Toad	*Anaxyrus boreas*
Aquatic Invertebrates	
Oregon floater (mussel)	*Anodonta oregonensis*
Western floater (mussel)	*Anodonta kennerlyi*
Western pearlshell mussel	*Margaritifera falcatata*
Western ridged mussel	*Gonidea angulata*
Birds	
American Bittern	*Botaurus lentiginosus*
American Coot	*Fulica americana*
American Crow	*Corvus brachyrhynchos*
American Dipper	*Cinclus mexicanus*
American Goldfinch	*Carduelis tristis*
American Kestrel	*Falco sparverius*
American Pipit	*Anthus rubescens*
American Redstart	*Setophaga ruticilla*
American Robin	*Turdus migratorius*
American Tree Sparrow	*Spizella arborea*
American White Pelican	*Pelecanus erythrorhynchos*
American Wigeon	*Anas americana*
Anna's Hummingbird	*Calypte anna*
Ash-throated Flycatcher	*Myiarchus cinerascens*
Baird's Sandpiper	*Calidris bairdii*
Bald Eagle	*Haliaeetus leucocephalus*
Baltimore Oriole	*Icterus galbula*
Band-tailed Pigeon	*Patagioenas fasciata*
Bank Swallow	*Riparia riparia*
Barn Owl	*Tyto alba*
Barn Swallow	*Hirundo rustica*
Barred Owl	*Strix varia*
Barrow's Goldeneye	*Bucephala islandica*
Belted Kingfisher	*Megaceryle alcyon*
Bewick's Wren	*Thryomanes bewickii*
Black Scoter	*Melanitta nigra*
Black Swift	*Cypseloides niger*
Black Tern	*Chlidonias niger*
Black-capped Chickadee	*Poecile atricapillus*
Black-headed Grosbeak	*Pheucticus melanocephalus*
Black-throated Gray Warbler	*Dendroica nigrescens*
Blue-gray Gnatcatcher	*Polioptila caerulea*
Blue-winged Teal	*Anas discors*
Bohemian Waxwing	*Bombycilla garrulus*
Bonaparte's Gull	*Chroicocephalus philadelphia*
Brant	*Branta bernicla*
Brewer's Blackbird	*Euphagus cyanocephalus*
Brewer's Sparrow	*Spizella breweri*
Brown Creeper	*Certhia americana*
Brown Pelican	*Pelecanus occidentalis*
Brown-headed Cowbird	*Molothrus ater*
Buff-breasted Sandpiper	*Tryngites subruficollis*
Bufflehead	*Bucephala albeola*
Bullock's Oriole	*Icterus bullockii*
Burrowing Owl	*Athene cunicularia*
Bushtit	*Psaltriparus minimus*
Cackling Goose	*Branta hutchinsii*
California Gull	*Larus californicus*
California Quail	*Callipepla californica*
Canada Goose	*Branta canadensis*
Canvasback	*Aythya valisineria*
Caspian Tern	*Hydroprogne caspia*
Cassin's Finch	*Carpodacus cassinii*
Cassin's Vireo	*Vireo cassinii*
Cattle Egret	*Bubulcus ibis*
Cedar Waxwing	*Bombycilla cedrorum*
Chestnut-backed Chickadee	*Poecile rufescens*
Chipping Sparrow	*Spizella passerina*
Cinnamon Teal	*Anas cyanoptera*
Clay-colored Sparrow	*Spizella pallida*
Cliff Swallow	*Petrochelidon pyrrhonota*
Common Goldeneye	*Bucephala clangula*
Common Loon	*Gavia immer*
Common Merganser	*Mergus merganser*
Common Nighthawk	*Chordeiles minor*
Common Poorwill	*Phalaenoptilus nuttallii*
Common Raven	*Corvus corax*

Common Name	Scientific Name
Common Redpoll	*Carduelis flammea*
Common Tern	*Sterna hirundo*
Common Yellowthroat	*Geothlypis trichas*
Cooper's Hawk	*Accipiter cooperii*
Dark-eyed Junco	*Junco hyemalis*
Double-crested Cormorant	*Phalacrocorax auritus*
Downy Woodpecker	*Picoides pubescens*
Dunlin	*Calidris alpina*
Eared Grebe	*Podiceps nigricollis*
Eastern Kingbird	*Tyrannus tyrannus*
Eurasian Collared-dove	*Streptopelia decaocto*
Eurasian Wigeon	*Anas penelope*
European Starling	*Sturnus vulgaris*
Evening Grosbeak	*Coccothraustes vespertinus*
Fox Sparrow	*Passerella iliaca*
Franklin's Gull	*Leucophaeus pipixcan*
Gadwall	*Anas strepera*
Glaucous Gull	*Larus hyperboreus*
Glaucous-winged Gull	*Larus glaucescens*
Golden-crowned Kinglet	*Regulus satrapa*
Golden-crowned Sparrow	*Zonotrichia atricapilla*
Gray Catbird	*Dumetella carolinensis*
Gray-crowned Rosy-finch	*Leucosticte tephrocotis*
Great Blue Heron	*Ardea herodias*
Great Egret	*Ardea alba*
Great Horned Owl	*Bubo virginianus*
Greater Scaup	*Aythya marila*
Greater White-fronted Goose	*Anser albifrons*
Greater Yellowlegs	*Tringa melanoleuca*
Green Heron	*Butorides virescens*
Green-winged Teal	*Anas crecca*
Hairy Woodpecker	*Picoides villosus*
Hammond's Flycatcher	*Empidonax hammondii*
Harlequin Duck	*Histrionicus histrionicus*
Hermit Thrush	*Catharus guttatus*
Herring Gull	*Larus argentatus*
Hooded Merganser	*Lophodytes cucullatus*
Horned Grebe	*Podiceps auritus*
House Finch	*Carpodacus mexicanus*
House Sparrow	*Passer domesticus*
House Wren	*Troglodytes aedon*
Hutton's Vireo	*Vireo huttoni*
Killdeer	*Charadrius vociferus*
Lapland Longspur	*Calcarius lapponicus*
Lark Sparrow	*Chondestes grammacus*
Lazuli Bunting	*Passerina amoena*
Least Flycatcher	*Empidonax minimus*
Least Sandpiper	*Calidris minutilla*
Lesser Goldfinch	*Carduelis psaltria*
Lesser Scaup	*Aythya affinis*
Lesser Yellowlegs	*Tringa flavipes*
Lewis's Woodpecker	*Melanerpes lewis*
Lincoln's Sparrow	*Melospiza lincolnii*
Loggerhead Shrike	*Lanius ludovicianus*
Long-billed Dowitcher	*Limnodromus scolopaceus*
Long-eared Owl	*Asio otus*
Long-tailed Jaeger	*Stercorarius longicaudus*
MacGillivray's Warbler	*Oporornis tolmiei*
Mallard	*Anas platyrhynchos*
Marbled Murrelet	*Brachyramphus marmoratus*
Marsh Wren	*Cistothorus palustris*
Merlin	*Falco columbarius*
Mew Gull	*Larus canus*
Mountain Bluebird	*Sialia currucoides*
Mountain Chickadee	*Poecile gambeli*
Mourning Dove	*Zenaida macroura*
Nashville Warbler	*Vermivora ruficapilla*
Northern Flicker	*Colaptes auratus*
Northern Goshawk	*Accipiter gentiliis*
Northern Harrier	*Circus cyaneus*
Northern Mockingbird	*Mimus polyglottos*
Northern Pintail	*Anas acuta*
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
Northern Saw-whet Owl	*Aegolius acadicus*
Northern Shoveler	*Anas clypeata*
Northern Shrike	*Lanius excubitor*
Northern Waterthrush	*Seiurus noveboracensis*
Olive-sided Flycatcher	*Contopus cooperi*
Orange-crowned Warbler	*Vermivora celata*
Osprey	*Pandion haliaetus*
Pacific Loon	*Gavia pacifica*
Pacific wren	*Troglodytes troglodytes*

Common Name	Scientific Name
Pacific-slope Flycatcher	*Empidonax difficilis*
Parasitic Jaeger	*Stercorarius parasiticus*
Pectoral Sandpiper	*Calidris melanotos*
Peregrine Falcon	*Falco peregrinus*
Pied-billed Grebe	*Podilymbus podiceps*
Pileated Woodpecker	*Dryocopus pileatus*
Pine Siskin	*Carduelis pinus*
Purple Finch	*Carpodacus purpureus*
Purple Martin	*Progne subis*
Red Crossbill	*Loxia curvirostra*
Red-breasted Nuthatch	*Sitta canadensis*
Red-breasted Sapsucker	*Sphyrapicus ruber*
Red-eyed Vireo	*Vireo olivaceus*
Redhead	*Aythya americana*
Red-naped Sapsucker	*Sphyrapicus nuchalis*
Red-necked Grebe	*Podiceps grisegena*
Red-shouldered Hawk	*Buteo lineatus*
Red-tailed Hawk	*Buteo jamaicensis*
Red-winged Blackbird	*Agelaius phoeniceus*
Ring-billed Gull	*Larus delawarensis*
Ring-necked Duck	*Aythya collaris*
Ring-necked Pheasant	*Phasianus colchicus*
Rock Pigeon	*Columba livia*
Rock Wren	*Salpinctes obsoletus*
Rough-legged Hawk	*Buteo lagopus*
Ruby-crowned Kinglet	*Regulus calendula*
Ruddy Duck	*Oxyura jamaicensis*
Ruffed Grouse	*Bonasa umbellus*
Rufous Hummingbird	*Selasphorus rufus*
Sage Thrasher	*Oreoscoptes montanus*
Sagebrush Sparrow	*Amphispiza belli*
Sandhill Crane	*Grus canadensis*
Savannah Sparrow	*Passerculus sandwichensis*
Say's Phoebe	*Sayornis saya*
Scissor-tailed Flycatcher	*Tyrannus forficatus*
Semipalmated Plover	*Charadrius semipalmatus*
Semipalmated Sandpiper	*Calidris pusilla*
Sharp-shinned Hawk	*Accipiter striatus*
Short-eared Owl	*Asio flammeus*
Smith's Longspur	*Calcarius pictus*
Snow Bunting	*Plectrophenax nivalis*
Snow Goose	*Chen caerulescens*
Snowy Owl	*Bubo scandiacus*
Solitary Sandpiper	*Tringa solitaria*
Song Sparrow	*Melospiza melodia*
Sora	*Porzana carolina*
Spotted Owl	*Strix occidentalis*
Spotted Sandpiper	*Actitis macularius*
Spotted Towhee	*Pipilo maculatus*
Steller's Jay	*Cyanocitta stelleri*
Streaked Horned Lark	*Eremophila alpestris strigata*
Surf Scoter	*Melanitta perspicillata*
Swainson's Hawk	*Buteo swainsoni*
Swainson's Thrush	*Catharus ustulatus*
Swamp Sparrow	*Melospiza georgiana*
Thayer's Gull	*Larus thayeri*
Townsend's Solitaire	*Myadestes townsendi*
Townsend's Warbler	*Dendroica townsendi*
Tree Swallow	*Tachycineta bicolor*
Tropical Kingbird	*Tyrannus melancholicus*
Trumpeter Swan	*Cygnus buccinator*
Tundra Swan	*Cygnus columbianus*
Turkey Vulture	*Cathartes aura*
Varied Thrush	*Ixoreus naevius*
Vaux's Swift	*Chaetura vauxi*
Vesper Sparrow	*Pooecetes gramineus*
Violet-green Swallow	*Tachycineta thalassina*
Virginia Rail	*Rallus limicola*
Warbling Vireo	*Vireo gilvus*
Western Grebe	*Aechmophorus occidentalis*
Western Gull	*Larus occidentalis*
Western Kingbird	*Tyrannus verticalis*
Western Meadowlark	*Sturnella neglecta*
Western Sandpiper	*Calidris mauri*
Western Screech-owl	*Megascops kennicottii*
Western Scrub-jay	*Aphelocoma californica*
Western Tanager	*Piranga ludoviciana*
Western Wood-pewee	*Contopus sordidulus*
Whimbrel	*Numenius phaeopus*
White-crowned Sparrow	*Zonotrichia leucophrys*
White-throated Sparrow	*Zonotrichia albicollis*
White-winged Scoter	*Melanitta fusca*

Common Name	Scientific Name
Willow Flycatcher	*Empidonax traillii*
Wilson's Snipe	*Gallinago delicata*
Wilson's Warbler	*Wilsonia pusilla*
Wood Duck	*Aix sponsa*
Yellow Warbler	*Dendroica petechia*
Yellow-billed Cuckoo	*Coccyzus americanus*
Yellow-breasted Chat	*Icteria virens*
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*
Yellow-rumped Warbler	*Dendroica coronata*

Fish

Bluegill	*Lepomis macrochirus*
Brown Bullhead Catfish	*Ameriurus nebulosus*
Bull Trout	*Salvelinus confluentus*
Chinook Salmon	*Oncorhynchus tshawytscha*
Chum Salmon	*Oncorhynchus keta*
Coho Salmon	*Oncorhynchus kisutch*
Cutthroat Trout	*Oncorhynchus clarkii*
Dace	*Rhinichthys* spp.
Green Sunfish	*Lepomis cyanellus*
Kokanee Salmon	*Oncorhynchus nerka*
Largemouth Bass	*Micropterus salmoides*
Largescale Sucker	*Catostomus macrocheilus*
Northern Pikeminnow	*Ptychocheilus oregonensis*
Pacific Lamprey	*Entosphenus tridentata*
Peamouth	*Mylocheilus caurinus*
Pink Salmon	*Oncorhynchus gorbuscha*
Pumpkinseed	*Lepomis gibbosus*
Rainbow Trout	*Oncorhynchus mykiss*
River Lamprey	*Lampetra ayresi*
Sculpin	*Cottus* spp.
Smallmouth Bass	*Micropterus dolomieui*
Sockeye Salmon	*Oncorhynchus nerka*
Steelhead	*Oncorhynchus mykiss*
Threespine Stickleback	*Gaterosteus aculeatus*
Whitefish	*Prosopium* spp.
Yellow Perch	*Perca flavescens*

Mammals

American Beaver	*Castor canadensis*
American Black Bear	*Ursus americanus*
American Mink	*Neovison vison*
American Shrew-mole	*Neurotrichus gibbsii*
Big Brown Bat	*Eptesicus fuscus*
Black-tailed Deer	*Odocoileus hemionus columbianus*
Bobcat	*Lynx rufus*
Coyote	*Canis latrans*
Deermouse	*Peromyscus maniculatus*
Douglas' Squirrel	*Tamiasciurus douglasii*
Eastern Cottontail	*Sylvilagus floridanus*
Eastern Gray Squirrel	*Sciurus carolinensis*
Elk	*Cervus elaphus*
Long-tailed Vole	*Microtus longicaudus*
Long-tailed Weasel	*Mustela frenata*
Marten	*Martes americana*
Mountain Beaver	*Aplodontia rufa*
Mountain Goat	*Oreamnos americanus*
Muskrat	*Ondatra zibethicus*
Myotis (Mouse-eared) Bats	*Myotis* spp.
North American Wolverine	*Gulo gulo luscus*
Northern Flying Squirrel	*Glaucomys sabrinus*
Northern Raccoon	*Procyon lotor*
Northern River Otter	*Lontra canadensis*
Northwestern Deermouse	*Peromyscus keeni*
Nutria	*Myocastor coypus*
Pika	*Ochotona princeps*
Townsend's Big-eared Bat	*Corynorhinus townsendii*
Townsend's Chipmunk	*Tamias townsendii*
Townsend's Mole	*Scapanus townsendii*
Townsend's Vole	*Microtus townsendii*
Virginia Opossum	*Didelphis virginiana*
Water Vole	*Microtus richardsoni*

Plants

American Vetch	*Vicia americana*
Bentgrass	*Agrostis* sp.
Bigleaf Maple	*Acer macrophyllum*
Bird's-foot Trefoil	*Lotus corniculatus*
Black Cottonwood	*Populus trichocarpa* (also, *Populus balsamifera* ssp. *trichocarpa*)
Bluegrass	*Poa* sp.
Bull Thistle	*Cirsium vulgare*
Cattail	*Typha latifolia*

Common Name	Scientific Name
Colonial Bentgrass	*Agrostis capillaris*
Common Rush	*Juncus effusus*
Common Snowberry	*Symphoricarpos albus*
Common Spikerush	*Eleocharis palustris*
Common Velvetgrass	*Holcus lanatus*
Creeping Buttercup	*Ranunculus repens*
Cutleaf Blackberry	*Rubus laciniatus*
Douglas-fir	*Pseudotsuga menziesii*
English Ivy	*Hedera helix*
Eurasian Water Milfoil	*Myriophyllum spicatum*
Giant Horsetail	*Equisetum telmateia*
Grand Fir	*Abies grandis*
Himalayan Blackberry	*Rubus armeniacus*
Incense Cedar	*Calocedrus decurrens*
Kentucky Bluegrass	*Poa pratensis*
Large-leaf Avens	*Geum macrophyllum*
Nootka Rose	*Rosa nutkana*
Norway Maple	*Acer platanoides*
Oneseed Hawthorn	*Crataegus monogyna*
Oregon Ash	*Fraxinus latifolia*
Pacific Ninebark	*Physocarpus capitatus*
Pacific Willow	*Salix lasiandra* (also, *Salix lucida* ssp. *lasiandra*)
Paper Birch	*Betula papyrifera*
Piggy-back Plant	*Tolmiea menziesii*
Red Alder	*Alnus rubra*
Redosier Dogwood	*Cornus sericea*
Reed Canarygrass	*Phalaris arundinacea*
Rose Spirea	*Spiraea douglasii*
Salmonberry	*Rubus spectabilis*
Scouler's Willow	*Salix scouleriana*
Sitka Spruce	*Picea sitchensis*
Sitka Willow	*Salix sitchensis*
Slough Sedge	*Carex obnupta*
Soft-stem Bulrush	*Schoenoplectus tabernaemontani*
Western Red cedar	*Thuja plicata*
Willow	*Salix* sp.

Reptiles

Common Gartersnake	*Thamnophis sirtalis*
Northern Painted Turtle	*Chrysemys picta*
Slider	*Trachemys scripta*
Western Fence Lizard	*Sceloporus occidentalis*

Attachment B

Wildlife Species Known or Expected to be Present in the Study Area

Amphibians, Reptiles, and Mammals That Have Been Observed in the Downtown Redmond Link Extension Study Area

Volunteers conducting bird surveys in Marymoor Park have also kept records of incidental observations of other animals (Friends of Marymoor Park 2016). The lists below are not exhaustive, nor have the species identifications been vetted by experts. Nevertheless, the observations are the product of hundreds of hours of effort by persons familiar with local flora and fauna and, as such, represent a valuable record of species that are known or expected to use habitats in and near the study area.

Amphibians and Reptiles

Pacific Treefrog
American Bullfrog
Northwestern Salamander
Long-toed Salamander
Northern Painted Turtle
Slider
Common Gartersnake

Mammals

Order: Artiodactyla (Even-toed Ungulates)

Family: Cervidae (Deer)
- Black-tailed Deer

Order: Carnivora (Carnivores)

Family: Canidae (Dogs)
- Coyote

Family: Felidae (Cats)
- Bobcat

Family: Mustelidae (Weasels, Badgers, Otters)
- Northern River Otter
- Long-tailed Weasel
- American Mink

Family: Procyonidae (Ringtail, Raccoon, Coati)
- Northern Raccoon

Family: Ursidae (Bears)
- American Black Bear

Order: Chiroptera (Bats)

Family: Vespertilionidae (Vesper Bats)*

Order: Didelphimorphia (Opossums)

Family: Didelphidae (Opossums)
- Virginia Opossum

Order: Insectivora (Shrews, Moles, Hedgehogs)†

Family: Talpidae (Moles)
- American Shrew-mole
- Townsend's Mole

Order: Lagomorpha (Rabbits, Hares, Pikas)

Family: Leporidae (Rabbits and Hares)
- Eastern Cottontail

Order: Rodentia (Rodents)

Family: Aplodontidae (Mountain Beaver)
- Mountain Beaver

Family: Castoridae (Beaver)
- American Beaver

Family: Muridae (Rats, Mice, Voles, Lemmings)
- Long-tailed Vole
- Water Vole
- Townsend's Vole
- Muskrat
- Deermouse
- Black Rat

Family: Myocastoridae (Nutrias)
- Nutria

Family: Sciuridae (Squirrels, Chipmunks, Etc.)
- Northern Flying Squirrel
- Townsend's Chipmunk
- Douglas' Squirrel
- Eastern Gray Squirrel

* Bats have been observed but not identified to species.
† Shrews and/or moles other than those listed here have been observed but not identified to species.

Bird Species Known or Expected to Occur in the Downtown Redmond Link Extension Study Area

The following bird species have been sighted in Marymoor Park, based on data from eBird (2017). Many of these species use habitats in other portions of the DRLE study area. Based on the diversity of habitat types in Marymoor Park, combined with the extent to which bird surveys have been conducted in the park, this list probably encompasses all species that may be present in the study area.

Bold typeface indicates species that are known or expected to breed in the nine-square-mile survey block that contains Marymoor Park and the DRLE study area, as reported in the *Breeding Bird Atlas of Island, King, Kitsap, and Kittitas Counties, Washington* (Opperman et al. 2006). Underlining indicates species identified as possible breeders by Opperman et al. (2006).

Italics indicate occasional visitors, defined as species with an average sighting frequency no greater than 0.5 percent in any particular season.

Ducks, Geese & Swans (Family Anatidae)

Greater White-fronted Goose
Snow Goose
Brant
Cackling Goose
Canada Goose
Trumpeter Swan
Tundra Swan
Wood Duck
Gadwall
Eurasian Wigeon
American Wigeon
Mallard
Blue-winged Teal
Cinnamon Teal
Northern Shoveler
Northern Pintail
Green-winged Teal
Canvasback
Redhead
Ring-necked Duck
Greater Scaup
Lesser Scaup
Surf Scoter
Bufflehead
Common Goldeneye
Barrow's Goldeneye
Hooded Merganser
Common Merganser
Ruddy Duck

Pheasants & Allies (Family Phasianidae)

Ring-necked Pheasant
Ruffed Grouse

New World Quail (Family Odontophoridae)

California Quail

Loons (Family Gaviidae)

Pacific Loon
Common Loon

Grebes (Family Podicipedidae)

Pied-billed Grebe
Horned Grebe
Red-necked Grebe
Eared Grebe
Western Grebe

Pelicans (Family Pelecanidae)

American White Pelican
Brown Pelican

Cormorants,Shags (Family Phalacrocoracidae)

Double-crested Cormorant

Herons, Bitterns (Family Ardeidae)

American Bittern
Great Blue Heron
Great Egret
Cattle Egret
Green Heron

New World Vultures (Family Cathartidae)

Turkey Vulture

Kites, Hawks & Eagles (Family Accipitridae)

Osprey
Bald Eagle
Northern Harrier
Sharp-shinned Hawk
Cooper's Hawk
Red-shouldered Hawk
Swainson's Hawk
Red-tailed Hawk
Rough-legged Hawk

Falcons (Family Falconidae)

American Kestrel
Merlin
Peregrine Falcon

Rails, Crakes & Coots (Family Rallidae)

Virginia Rail
Sora
American Coot

Cranes (Family Gruidae)

Sandhill Crane

Plovers (Family Charadriidae)

Semipalmated Plover
Killdeer

Sandpipers, Snipes (Family Scolopacidae)

Spotted Sandpiper
Solitary Sandpiper
Greater Yellowlegs
Lesser Yellowlegs

Whimbrel
Semipalmated Sandpiper
Western Sandpiper
Least Sandpiper
Baird's Sandpiper
Pectoral Sandpiper
Dunlin
Buff-breasted Sandpiper
Long-billed Dowitcher
Wilson's Snipe

Gulls, Terns, and Skimmers (Family Laridae)

Bonaparte's Gull
Franklin's Gull
Mew Gull
Ring-billed Gull
Western Gull
California Gull
Herring Gull
Thayer's Gull
Glaucous-winged Gull
Glaucous Gull
Caspian Tern
Black Tern
Common Tern

Skuas (Family Stercorariidae)

Parasitic Jaeger
Long-tailed Jaeger

Pigeons, Doves (Family Columbidae)

Rock Pigeon
Band-tailed Pigeon
Eurasian Collared-Dove
Mourning Dove

Barn Owls (Family Tytonidae)

Barn Owl

Owls (Family Strigidae)

Western Screech-Owl
Great Horned Owl
Snowy Owl
Burrowing Owl
Barred Owl
Long-eared Owl
Short-eared Owl
Northern Saw-whet Owl

Nightjars (Family Caprimulgidae)

Common Nighthawk
Common Poorwill

Swifts (Family Apodidae)

Black Swift
Vaux's Swift

Hummingbirds (Family Trochilidae)

Anna's Hummingbird
Rufous Hummingbird

Kingfishers (Family Alcedinidae)

Belted Kingfisher

Woodpeckers (Family Picidae)

Lewis's Woodpecker
Red-naped Sapsucker
Red-breasted Sapsucker
Downy Woodpecker
Hairy Woodpecker
Northern Flicker
Pileated Woodpecker

Tyrant Flycatchers (Family Tyrannidae)

Olive-sided Flycatcher
Western Wood-Pewee
Willow Flycatcher
Least Flycatcher
Hammond's Flycatcher
Pacific-slope Flycatcher
Say's Phoebe
Ash-throated Flycatcher
Tropical Kingbird
Western Kingbird
Eastern Kingbird
Scissor-tailed Flycatcher

Shrikes (Family Laniidae)

Loggerhead Shrike
Northern Shrike

Vireos and allies (Family Vireonidae)

Cassin's Vireo
Hutton's Vireo
Warbling Vireo
Red-eyed Vireo

Crows, Jays (Family Corvidae)

Steller's Jay
Western Scrub-Jay
American Crow
Common Raven

Larks (Family Alaudidae)

Horned Lark

Swallows, Martins (Family Hirundinidae)

Purple Martin
Tree Swallow
Violet-green Swallow
Northern Rough-winged Swallow
Bank Swallow
Cliff Swallow
Barn Swallow

Tits, Chickadees (Family Paridae)

Black-capped Chickadee
Mountain Chickadee
Chestnut-backed Chickadee

Bushtits (Family Aegithalidae)

Bushtit

Nuthatches (Family Sittidae)

Red-breasted Nuthatch

Treecreepers (Family Certhiidae)

Brown Creeper

Wrens (Family Troglodytidae)

Rock Wren
Bewick's Wren
House Wren
Pacific wren
Marsh Wren

Dippers (Family Cinclidae)

American Dipper

Goldcrests, Kinglets (Family Regulidae)

Golden-crowned Kinglet
Ruby-crowned Kinglet

Sylviid Babblers (Family Sylviidae)

Blue-gray Gnatcatcher

Thrushes (Family Turdidae)

Mountain Bluebird
Townsend's Solitaire
Swainson's Thrush
Hermit Thrush
American Robin
Varied Thrush

Mockingbirds, Thrashers (Family Mimidae)

Gray Catbird

Northern Mockingbird
Sage Thrasher

Starlings (Family Sturnidae)

European Starling

Wagtails, Pipits (Family Motacillidae)

American Pipit

Waxwings (Family Bombycillidae)

Bohemian Waxwing
Cedar Waxwing

New World Warblers (Family Parulidae)

Orange-crowned Warbler
Nashville Warbler
Yellow Warbler
Yellow-rumped Warbler
Black-throated Gray Warbler
Townsend's Warbler
American Redstart
Northern Waterthrush
MacGillivray's Warbler
Common Yellowthroat
Wilson's Warbler
Yellow-breasted Chat

Tanagers (Family Thraupidae)

Western Tanager

Buntings, New World Sparrows, and allies (Family Emberizidae)

Spotted Towhee
American Tree Sparrow
Chipping Sparrow
Clay-colored Sparrow
Brewer's Sparrow
Vesper Sparrow
Lark Sparrow
Sagebrush Sparrow
Savannah Sparrow
Fox Sparrow
Song Sparrow
Lincoln's Sparrow
Swamp Sparrow
White-throated Sparrow
White-crowned Sparrow
Golden-crowned Sparrow
Dark-eyed Junco
Lapland Longspur
Smith's Longspur
Snow Bunting

Cardinals, Grosbeaks, and allies (Family Cardinalidae)

Black-headed Grosbeak
Lazuli Bunting

Orioles and Blackbirds (Family Icteridae)

Red-winged Blackbird
Western Meadowlark
Yellow-headed Blackbird
Brewer's Blackbird
Brown-headed Cowbird
Bullock's Oriole
Baltimore Oriole

Finches (Family Fringillidae)

Gray-crowned Rosy-Finch
Purple Finch
House Finch
Red Crossbill
Common Redpoll
Pine Siskin
Lesser Goldfinch
American Goldfinch
Evening Grosbeak

Old World Sparrows (Family Passeridae)

House Sparrow

Attachment C

Wetland and Stream Delineation Report

Downtown Redmond Link Extension Attachment C - Wetland and Stream Delineation Report

August 2018

Prepared for

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ACRONYMS AND ABBREVIATIONS

ACIS	Applied Climate Information System
cfs	cubic feet per second
Corps	U.S. Army Corps of Engineers
Ecology	Washington State Department of Ecology
FGDC	Federal Geographic Data Committee
HGM	hydrogeomorphic
KCC	King County Code
NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	ordinary high water mark
PHS	Priority Habitats and Species
PEM	palustrine emergent
PFO	palustrine forested
PSS	palustrine scrub-shrub
RCW	Revised Code of Washington
RZC	Redmond Zoning Code
SEPA	State Environmental Policy Act
SMP	Shoreline Management Program
Sound Transit	Central Puget Sound Regional Transit Authority
SR	State Route
TMDL	Total Maximum Daily Load
UPL	upland
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation

1. INTRODUCTION

Wetland and stream resources in the Downtown Redmond Link Extension Project vicinity were mapped and characterized to accurately provide updated information for preliminary engineering of the project and environmental analysis in compliance with National Environmental Policy Act (NEPA) and State Environmental Policy Act (SEPA) requirements. This report provides a thorough inventory of wetlands, streams, buffers, and their conditions in the project area that can be used for: (1) determining the project's temporary construction impacts, (2) quantifying permanent operational impacts on wetlands and streams, and (3) describing measures to avoid, minimize, or compensate for project impacts. A mitigation plan for the Proposed Design Refinements will be prepared as this project progresses and will contain the wetland impact analysis and mitigation measures.

1.1 Project Footprint

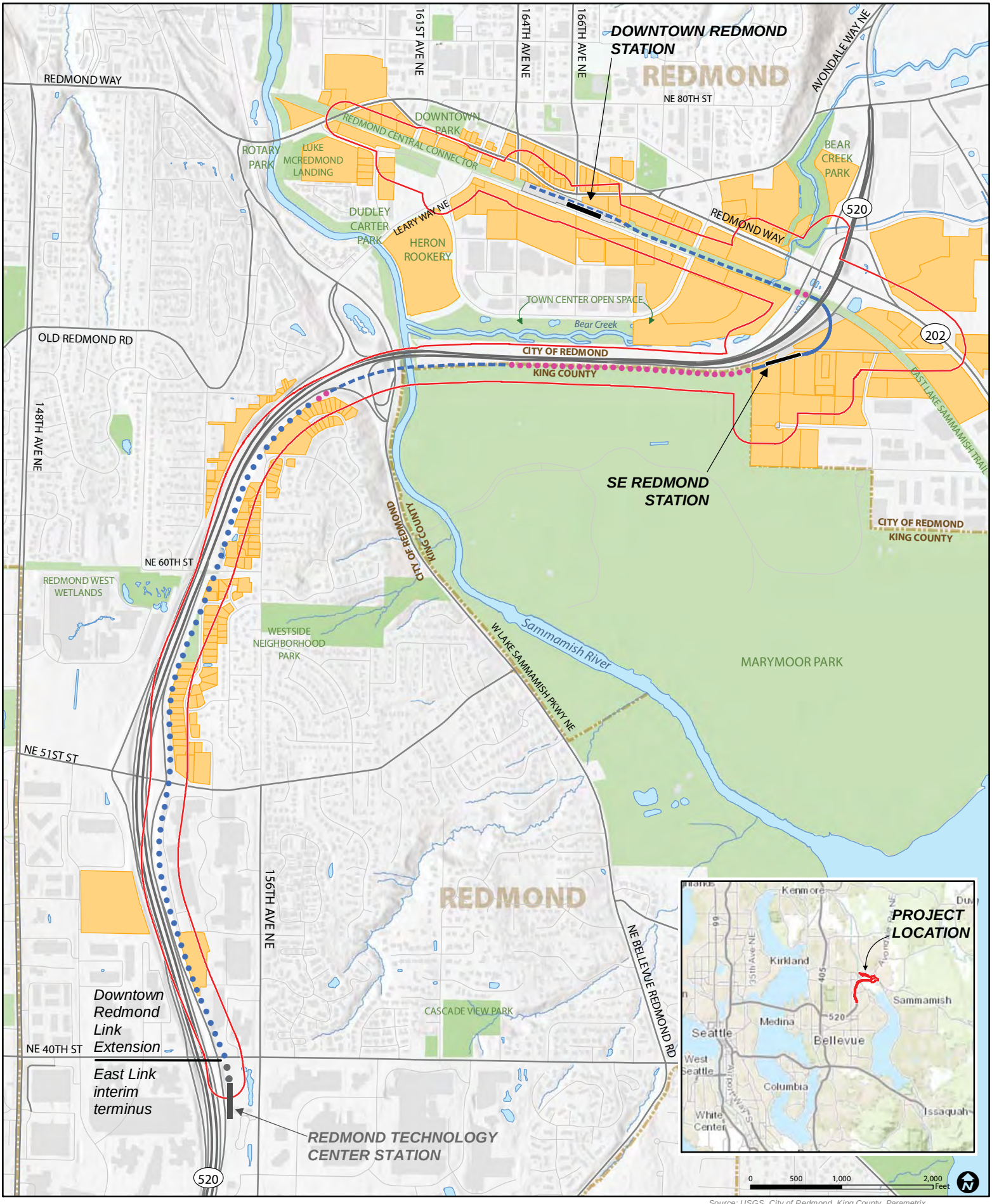
The Downtown Redmond Link Extension will add 3.4 miles of light rail and two new light rail stations from the interim terminus of the Redmond Technology Center Station (formerly called the Overlake Transit Center Station) to downtown Redmond. For the wetland and stream assessment, the project footprint is defined as the construction limits (i.e., the maximum extents within which clearing, grading, and the operation of construction machinery will occur) for this light rail extension. The footprint includes the extents of the following features:

- Alignment route
- Areas within the vicinity of stations, traction power substations, and other infrastructure
- Park-and-ride lots and roadway widening associated with the project

1.2 Study Area

The study area for wetland and stream assessments is located in the city of Redmond and in unincorporated King County, Washington, in Sections 11, 12, 13, 14, and 23, Township 25N, Range 05E, Willamette Meridian. Consistent with the requirements of the King County and City of Redmond critical areas codes, the study area for wetlands and aquatic habitats (including streams) extends 300 feet from the limits of the project footprint. On-the-ground delineations were conducted within 200 feet of the project footprint limits, with wetland and stream resource conditions estimated beyond that area. Figure 1-1 shows the study area, including parcels within which property access was granted and on-the-ground delineations were conducted. In those areas that were not accessed, wetland and stream resources were estimated. In areas without property access, estimates of wetland extent and ratings were based on aerial photography, topographic maps, and other background sources, as well as attributes visible from publicly accessible areas.

Much of the study area consists of developed urban areas, including commercial and residential areas, as well as State Route (SR) 520. Patches of less-developed areas occur in Marymoor Park, forested areas along SR 520, and the Bear Creek and Sammamish River riparian corridors. The western portion of the study area drains to the Sammamish River, while the eastern portion drains to Bear Creek, a tributary to the Sammamish River. Both portions are in Water Resource Inventory Area (WRIA) 8, Lake Washington/Cedar/Sammamish.



Alignment
- At-Grade
- Elevated
- Retained Fill
- Retained Cut

- Station Platform
- Station Area
- Study Area
- Private Parcels (No Access)

Source: USGS, City of Redmond, King County, Parametrix

Figure 1-1
Vicinity Map
Downtown Redmond Link Extension

2. METHODS

This environmental analysis is based on data obtained through a review of existing information and during field investigations. The goal of these efforts was to document existing information to reflect current site conditions and to collect new information necessary to assess wetland and stream boundaries.

2.1 Existing Information

Prior to field investigations, Parametrix reviewed public resource information including, but not limited to, the following sources:

- Aerial photography of the project corridor (including the King County aerial photography database and Google Earth database)
- Critical area maps from local jurisdictions (City of Redmond 2005a, 2005b, and 2017; King County 2017a)
- Critical area codes for local jurisdictions (City of Redmond 2017; King County 2017b)
- National Wetlands Inventory (NWI) data (U.S. Fish and Wildlife Service [USFWS] 2017)
- Wetland and stream mapping by King County (King County 2017a)
- Priority Habitats and Species (PHS) data (Washington Department of Fish and Wildlife [WDFW] 2017a)
- Natural Resources Conservation Service (NRCS) Web soil survey (NRCS 2017)
- Stream flow data from the King County Hydrologic Information Center (King County 2017c)
- Climate data for King County as measured at the Seattle Sand Point Station (Applied Climate Information System [ACIS] 2017)

2.2 Wetland Identification and Delineation

Parametrix biologists used the methods specified in the U.S. Army Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987) and the indicators described in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (U.S. Army Corps of Engineers [Corps] 2010) to delineate on-site wetlands.

Wetlands are defined as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. An area must meet these three criteria or exhibit at least one positive field indicator of wetland vegetation, soils, and hydrology to be considered a wetland. Wetland determination data forms from the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Corps 2010) were recorded for each wetland.

2.2.1 Project-Specific Methods

The field investigation period was adjusted to respond to property access and weather-related issues. Field work was initiated based on property access schedules. Delineations in Marymoor Park and near Bear Creek began in February 2017, with follow-up hydrology assessments in March and April (due to above-average precipitation in February and March). Some private property (Microsoft campus) was also

delineated during this period. City of Redmond properties were delineated in April, May, and August. Areas within the Washington State Department of Transportation (WSDOT) right-of-way were delineated in May and June.

2.2.2 Vegetation

During the field investigations, the biologists observed the dominant plant species and recorded each on data forms for each sample plot. They evaluated dominant plants and their wetland indicator status to determine whether the vegetation was hydrophytic. Hydrophytic vegetation is generally defined as vegetation adapted to prolonged saturated soil conditions. To meet the hydrophytic vegetation criterion, more than 50 percent of the dominant plants must be Facultative, Facultative Wetland, or Obligate, based on the plant indicator status category assigned to each plant species by the Corps (Lichvar et al. 2012; Lichvar et al. 2016).

Scientific and common plant names follow currently accepted nomenclature. Most names are consistent with Flora of the Pacific Northwest (Hitchcock and Cronquist 1973), Plants of the Pacific Northwest Coast (Pojar and MacKinnon 1994), and the USDA PLANTS Database (USDA 2017). However, scientific names listed in the 2016 National Plant List (Lichvar et al. 2016) were used as the final authority in preparing data forms and determining species indicator status.

2.2.3 Soils

Generally, an area must have hydric soils to be a wetland. Hydric soil forms when soils are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper layers. Biological activities in saturated soil result in reduced oxygen concentrations that create a preponderance of organisms using anaerobic processes for metabolism. Over time, anaerobic biological processes produce certain color patterns in mineral soils and/or enhance accumulation of organic soils (e.g., peat), which are used as field indicators of hydric soil. Typically, low-chroma colors are formed in the soil matrix. Bright-colored redoximorphic features form within the matrix under a fluctuating water table. Other important hydric soil indicators include organic matter accumulations in the surface horizon, reduced sulfur odors, and organic matter staining in the subsurface. Soils were examined by excavating sample plots to a depth of 16 inches or more, wherever feasible, to observe soil profiles, colors, and textures. Munsell® color charts (Munsell® Color 2015) were used to describe soil colors and the Field Book for Describing and Sampling Soils (Schoenebergerm, Wysocki, and Benham 2012) was used to describe the soil texture class.

2.2.4 Hydrology

The study area was examined for evidence of hydrology. An area is considered to have wetland hydrology when soils are ponded or saturated consecutively for 12.5 percent of the growing season (Environmental Laboratory 1987). The growing season generally occurs from late February (February 27) to late November (November 21) (based on Seattle Sand Point station climate data). Therefore, ponding or saturation must be present for approximately 33 consecutive days within the growing season. Wetland hydrology is determined by the identification of specific indicators described in the regional supplement (Corps 2010). The observation of one primary indicator or two secondary indicators is a positive indication of wetland hydrology. The project is located in Major Land Use Area 2, within Land Resource Region A (Corps 2010; NRCS 2006). Within these regions, primary and secondary indicators of hydrology are described by group and comprise:

- Group A (Observation of Surface Water or Saturated Soils): Surface inundation, high water table, and saturated soils
- Group B (Evidence of Recent Saturation): Water marks, sediment and drift deposits, algal mats, iron deposits, surface soil cracks, inundation visible on aerial imagery, sparsely vegetated concave surfaces, salt crusts, and aquatic invertebrates. *Secondary*: Water-stained leaves and drainage patterns
- Group C (Evidence of Current or Recent Soil Saturation): Hydrogen sulfide odor, oxidized rhizospheres along living roots, presence of reduced iron, and recent iron reduction in tilled soils. *Secondary*: Dry-season water table and saturation evident on aerial imagery.
- Group D (Evidence from Other Site Conditions or Data): Stunted or stressed plants. *Secondary*: geomorphic position, shallow aquitard, vegetation Facultative-neutral test, raised ant mounds, and frost-heave hummocks

2.2.5 Wetland Classification and Rating

Delineated wetlands were classified according to the USFWS Classification of Wetlands and Deepwater Habitats of the United States (Federal Geographic Data Committee [FGDC] 2013; Cowardin et al. 1979) and Hydrogeomorphic (HGM) Approach (Brinson 1993). Wetlands were also classified and rated according to local critical area ordinances (King County 2017b; City of Redmond 2017). In addition, within the entire study area, wetland ratings and functions were assessed by applying the Washington State Wetland Rating System for Western Washington—Revised (Hruby 2004) and the 2014 Update (Hruby 2014). These rating systems assign a relative wetland category based on level of functions provided by the wetland as follows:

- Category I: Unique or rare wetland type, more sensitive to disturbance than most wetlands, relatively undisturbed, and contain ecological attributes that are impossible to replace within a human lifetime, or provide a high level of functions
- Category II: High level of some functions
- Category III: Moderate level of functions
- Category IV: Lowest level of functions

Wetlands within the city of Redmond are classified using the Washington State Wetland Rating System for Western Washington: 2014 Update (Hruby 2014), in accordance with the Redmond Zoning Code (RZC) 21.64.030(A). Buffer widths are assigned based on these classifications (RZC Table 21.64.030(A)). Wetlands in King County are classified using the Washington State Wetland Rating System for Western Washington—Revised (Hruby 2004), according to the King County Code (KCC) 21A.24.318(A). Buffer widths are assigned based on these classifications (KCC 21A.24.325(A)(1)).

2.3 Streams

The ordinary high water mark (OHWM) was determined and mapped for all streams in the study area. Streams were then classified according to criteria in local ordinances.

2.3.1 Ordinary High Water Determination

The OHWM, line, and elevation in streams were evaluated for compliance with criteria detailed in the Shoreline Management Act (Revised Code of Washington [RCW] 90.58.030(2)(b), Washington Administrative Code [WAC] 173-22-030(5), and Hydraulic Code Rules [WAC 220-110-020(31)]). Biologists trained in the use of ordinary high water determination methods developed by the Washington State

Department of Ecology (Ecology) (Stockdale et al. 2016) reviewed stream gauge data recorded over several years to determine typical annual to biannual high flows (1- to 2-year return interval). The field crew observed a range of high flows during the late winter of 2017 and compared these water elevations to real-time stream gauging to establish the extents and elevation of ordinary high water. These locations were flagged by the field staff and mapped by professional land survey crews.

2.3.2 Stream Classification and Rating

The state of Washington uses an interim water typing system to classify and characterize streams (WAC 222-16-031). This system uses five classes to describe streams:

- Type 1 Waters: Shorelines of the State
- Type 2 Waters: Segments of natural waters, which are not classified as Type 1 Water and have a high fish, wildlife, or human use. Channel is 20 feet or wider; gradient is less than 4 percent; the waterbody is connected to a fish-bearing stream at some time of year; and it is used by fish for off-channel habitat that is accessible with a less than 5 percent gradient.
- Type 3 Waters: Segments of natural waters, which are not classified as Type 1 or 2 Water and have moderate to slight fish, wildlife, or human use. Channel is 2 feet or wider and gradient is less than 16 percent (or between 16 and 20 percent if the contributing basin size is greater than 50 acres).
- Type 4 Waters: All segments of natural waters with defined channels that are perennial non-fish habitat streams.
- Type 5 Waters: All segments of natural waters that are not Type 1, 2, 3, or 4 Water. The streams are seasonal non-fish habitat streams for which surface flow is not present for some portion of the year and are not located downstream of Type 4 Water. Type 5 Waters must be physically connected by an aboveground channel to Type 1, 2, 3, or 4 Water.

The Redmond Zoning Code (RZC 21.64.020(A)(2)(d), Riparian Stream Corridors) classifies natural streams into four classes:

- Class I: Streams identified as Shorelines of the State under the City of Redmond Shoreline Master Program
- Class II: Natural streams that are not Class I and are either perennial or intermittent and have salmonid fish use or the potential for salmonid fish use
- Class III: Natural streams that are not Class I or Class II and are either perennial or intermittent and either (1) have non-salmonid fish use or the potential for non-salmonid fish use, or (2) are headwater streams with a surface water connection to salmon-bearing or potentially salmon-bearing streams (Class I or II)
- Class IV: Natural streams that are not Class I, Class II, or Class III, are either perennial or intermittent, do not have fish or the potential for fish, and are non-headwater streams

Buffer widths are assigned based on these classifications (RZC Table 21.64.020.).

King County Code (KCC 21A.24.355, Aquatic Areas—Water Types) classifies streams into the following classes:

- Type S: All aquatic areas inventoried as "shorelines of the state" under King County's Shoreline Master Program (KCC Title 25) in accordance with chapter 90.58 RCW, including segments of

streams where the mean annual flow is more than 20 cubic feet per second, and marine shorelines and lakes are 20 acres in size or larger

- Type F: All segments of aquatic areas that are not Type S waters and that contain fish or fish habitat, including waters diverted for use by a federal, state, or tribal fish hatchery from the point of diversion for 1,500 feet or the entire tributary if the tributary is highly significant for protection of downstream water quality
- Type N: All segments of aquatic areas that are not Type S or F waters and that are physically connected to Type S or F waters by an aboveground channel system, stream, or wetland
- Type O: All segments of aquatic areas that are not Type S, F, or N waters and that are not physically connected to Type S, F, or N waters by an aboveground channel system, pipe, or culvert, stream, or wetland

Buffer widths are assigned based on these classifications, and whether the stream is located inside or outside the King County Urban Growth Area (KCC 21A.24.358, Aquatic Areas—Buffers).

3. RESULTS

3.1 Summary of Existing Information

Project biologists compiled and analyzed the existing project information. The following sections describe the historical site conditions that affect wetland determinations, previously mapped wetlands, soil survey information, and climate data (precipitation data and water level gauging on streams) in the study area.

3.1.1 Historical Conditions

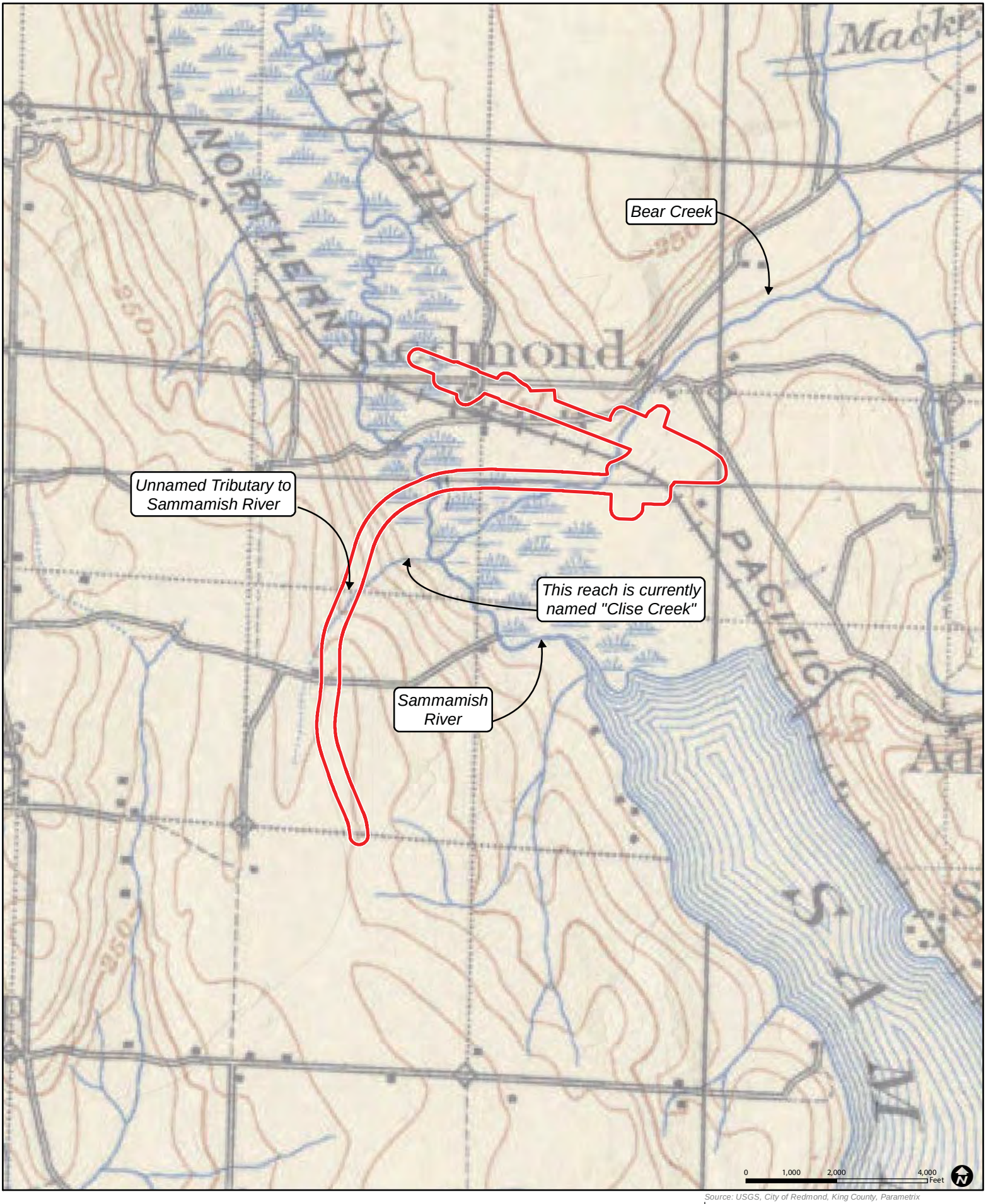
The study area has been highly modified by human development since European settlement approximately 150 years ago. Before European settlement of the region, the Sammamish River was twice as long as it is now and had a complex, highly sinuous, meandering channel with abundant associated forested wetlands. Figure 3-1 shows the landscape conditions in 1897, as represented on U.S. Geological Survey (USGS) maps. Figure 3-1 shows extensive wetlands throughout the floodplain of the Sammamish River from Lake Sammamish into the city of Redmond, as well as the original meandering alignment of the river. It also shows the original alignment of Bear Creek and the location of a tributary to the Sammamish River that met the river directly across from the Bear Creek confluence. This is important because the original alignment of Bear Creek coincides with a series of wetlands in Marymoor Park, with a localized water table that was observed to be closer to the surface in this corridor than adjacent areas of similar elevation.

By the early 1900s, the landscape had been extensively modified to support agricultural development. The area was logged from the 1870s through the early 20th century. Before construction of the Lake Washington Ship Canal and subsequent lowering of water levels in Lake Washington, this reach of the Sammamish River was likely part of Lake Sammamish (U.S. Army Corps of Engineers and King County 2002).

When Lake Washington was lowered by 10 feet in 1916, the overall gradient in the Sammamish River was increased accordingly and many wetland areas were drained. The Sammamish River and Bear Creek channels were straightened and leveed and the wetlands in the floodplain drained as part of the development of Marymoor Farm and adjacent agricultural areas. These changes are evident in aerial photography from 1935 (Figure 3-2). As agriculture expanded in the Sammamish Valley, more wetlands were drained and converted into farmed fields. Farmers began to straighten the channel around 1911 (U.S. Army Corps of Engineers and King County 2002). In 1962, the Corps deepened and channelized the river to its present location. When the river was dredged and neighboring lands were cleared, all large woody debris was removed, as were riparian trees.

These alterations to streams and hydrology are noteworthy because the soils that occur in the floodplain have been drained and isolated from overbank river flows, requiring careful scrutiny of current hydrologic conditions during delineations to distinguish between active and relict hydric soils.

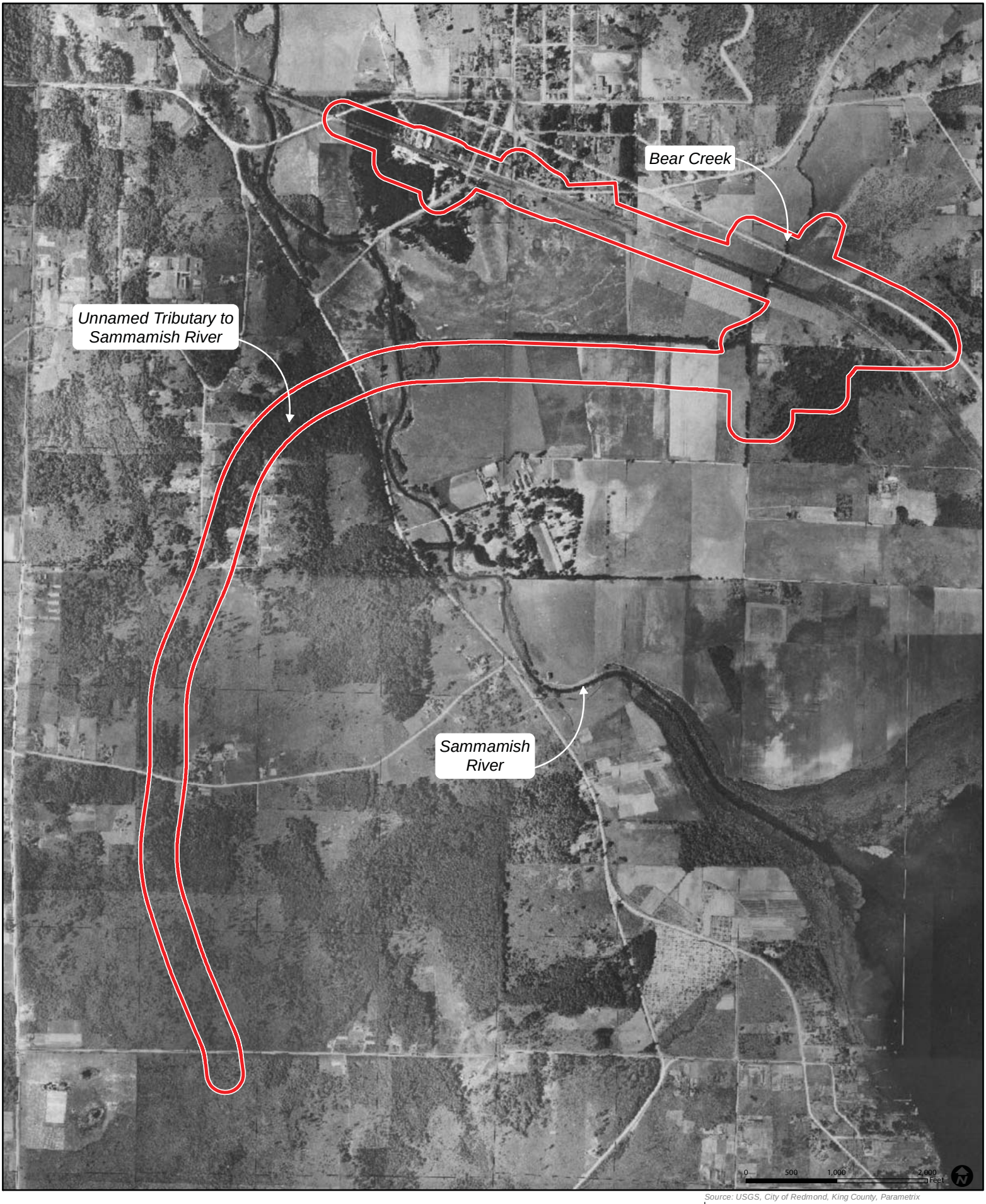
The construction of SR 520 in the 1970s, and reconstruction work in the 1990s and 2000s, extensively modified conditions in the study area. Road grading appears to have intercepted the upper reaches of an unnamed tributary to the Sammamish River (see Figure 3-1) (now called Clise Creek by the City of Redmond) that continued through a forested ravine (Figure 3-2) before flowing into the Sammamish River. The extensive cut and fill activities have obliterated the native soil profiles, creating challenging soil assessment conditions (see discussion in Sections 3.1.3 and 3.2.1). The installation and operation of stormwater management systems that have been in place for decades (including drainage networks and stormwater infiltration areas) further complicate the evaluation of jurisdictional hydrology (see discussion in Section 3.2.1).



Source: USGS, City of Redmond, King County, Parametrix

Study Area

Figure 3-1
Historical USGS Topo (1895)
Downtown Redmond Link Extension



Source: USGS, City of Redmond, King County, Parametrix

Study Area

Figure 3-2
Historical Aerial (1936)
Downtown Redmond Link Extension

3.1.2 Previously Mapped Wetlands and Streams

USFWS, King County (201), and the City of Redmond (2017) identify multiple seasonally flooded palustrine forested, scrub-shrub, or emergent wetlands within the study area (Figure 3-3). These sources and USGS (2018) map Bear Creek and the Sammamish River (Figure 3-3). In addition, USGS (2018), WDFW (2018), WDNR (2018), and King County (2017a) map an unnamed tributary to Bear Creek (LLID 1221079476713) and an unnamed tributary to the Sammamish River (LLID 1221262476704). However, King County (2017a) maps the unnamed tributary to the Sammamish River on the opposite side of SR 520.

The study area is bisected by the Sammamish River. The shoreline zone within the boundaries of Marymoor Park falls within the shoreline management jurisdiction of King County. North of the park, the shoreline zone falls within the shoreline management jurisdiction of the City of Redmond. Within Redmond, the Sammamish River is designated as a Fish and Wildlife Habitat Conservation Area and Class I stream. The Sammamish River has one unnamed tributary within the study area (as described in the paragraph above). The stream origin is mapped to the north of NE 40th Street. The stream then flows to the north parallel to SR 520 before discharging to the Sammamish River (Figure 3-3).

East of the Sammamish River, Bear Creek is located approximately 500 feet to the north of the study area and runs for about 3 miles. It is then crossed by the study area as the light rail alignment transitions from following SR 520 to Redmond Way. Bear Creek is designated by the City of Redmond as a Fish and Wildlife Habitat Conservation Area and Class I stream. The shoreline zone falls within the shoreline management jurisdiction of the City of Redmond.

There is one unnamed tributary to Bear Creek (LLID No. LLID 1221079476713) located to the North of Redmond Way (WDNR 2018). This tributary originates off site before flowing underground towards the Bear Creek floodplain. The stream resurfaces and flows south parallel to NE 76th Street before discharging to Bear Creek (King County 2017a).

3.1.3 Soils

Table 3-1 lists the soil types found within the study area. The predominant soil types mapped within the study area are Indianola loamy sand (0 to 5 percent slopes), Earlmont silt loam, Alderwood gravelly sandy loam, and Everett gravelly sandy loam (see Table 3-1 and Figure 3-4).

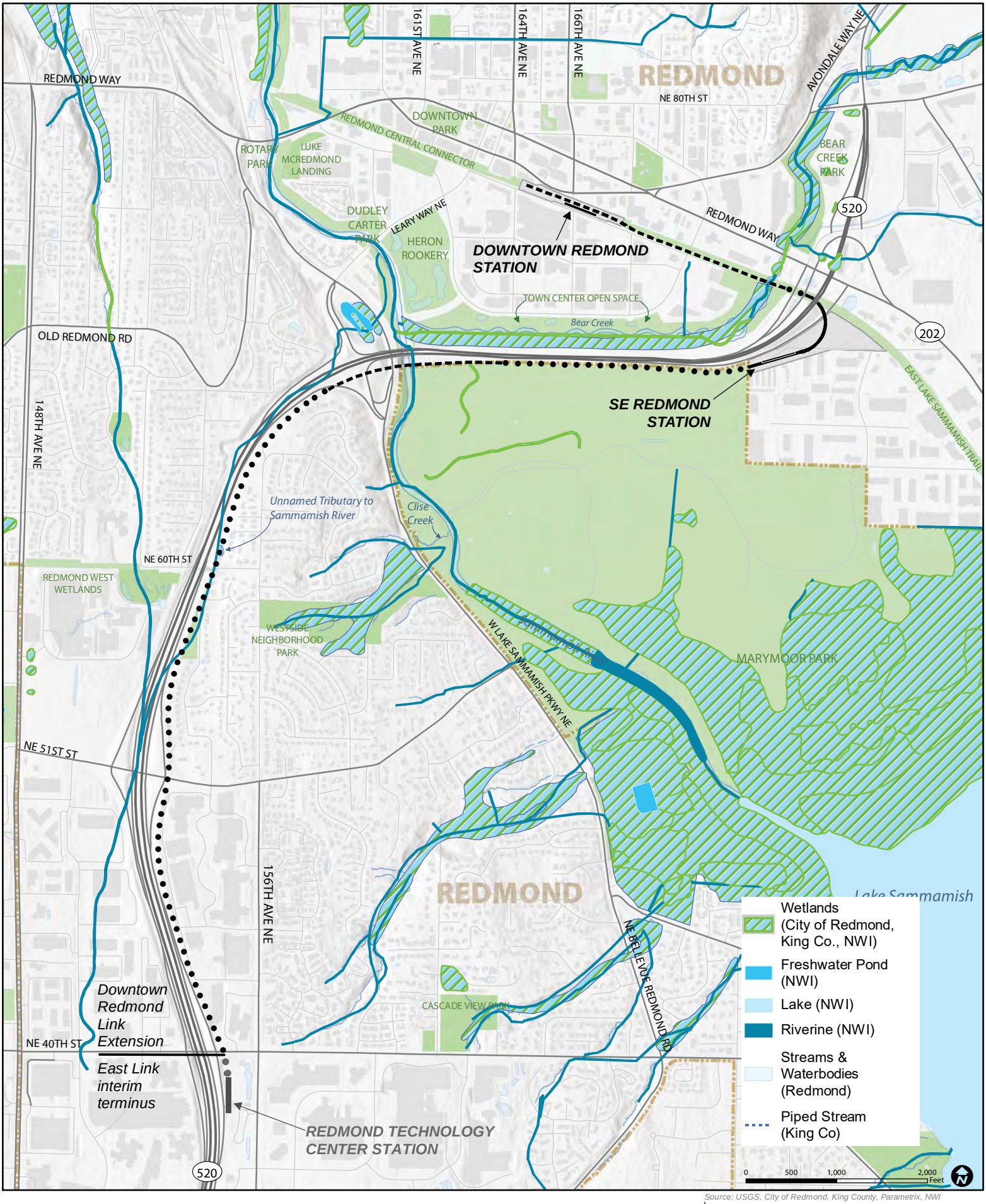
Table 3-1. Soil Types within the Wetland and Stream Study Area

Map Unit Symbol	Map Unit Name	Hydric Soil Rating[a]	Acres within Study Area (Percent of Total)
AgB	Alderwood gravelly sandy loam, 0 to 6 percent slopes	1-32%	54.2 (16)
AgC	Alderwood gravelly sandy loam, 6 to 15 percent slopes	1-32%	41.4 (13)
AmB	Arents, Alderwood material, 0 to 6 percent slopes	<1%	3.3 (1)
Ea	Earlmont silt loam	66-99%	61.3 (19)
EvB	Everett gravelly sandy loam, 0 to 5 percent slopes	0%	28 (8)
InA	Indianola loamy fine sand, 0 to 4 percent slopes	1-32%	107.6 (33)
KpC	Kitsap silt loam, 8 to 15 percent slopes	1-32%	21 (6)
Pc	Pilchuck loamy fine sand	1-32%	8.3 (3)
Su	Sultan silt loam	1-32%	4.6 (1)
W	Water	0%	1.0 (<1)

[a] NRCS (2017)

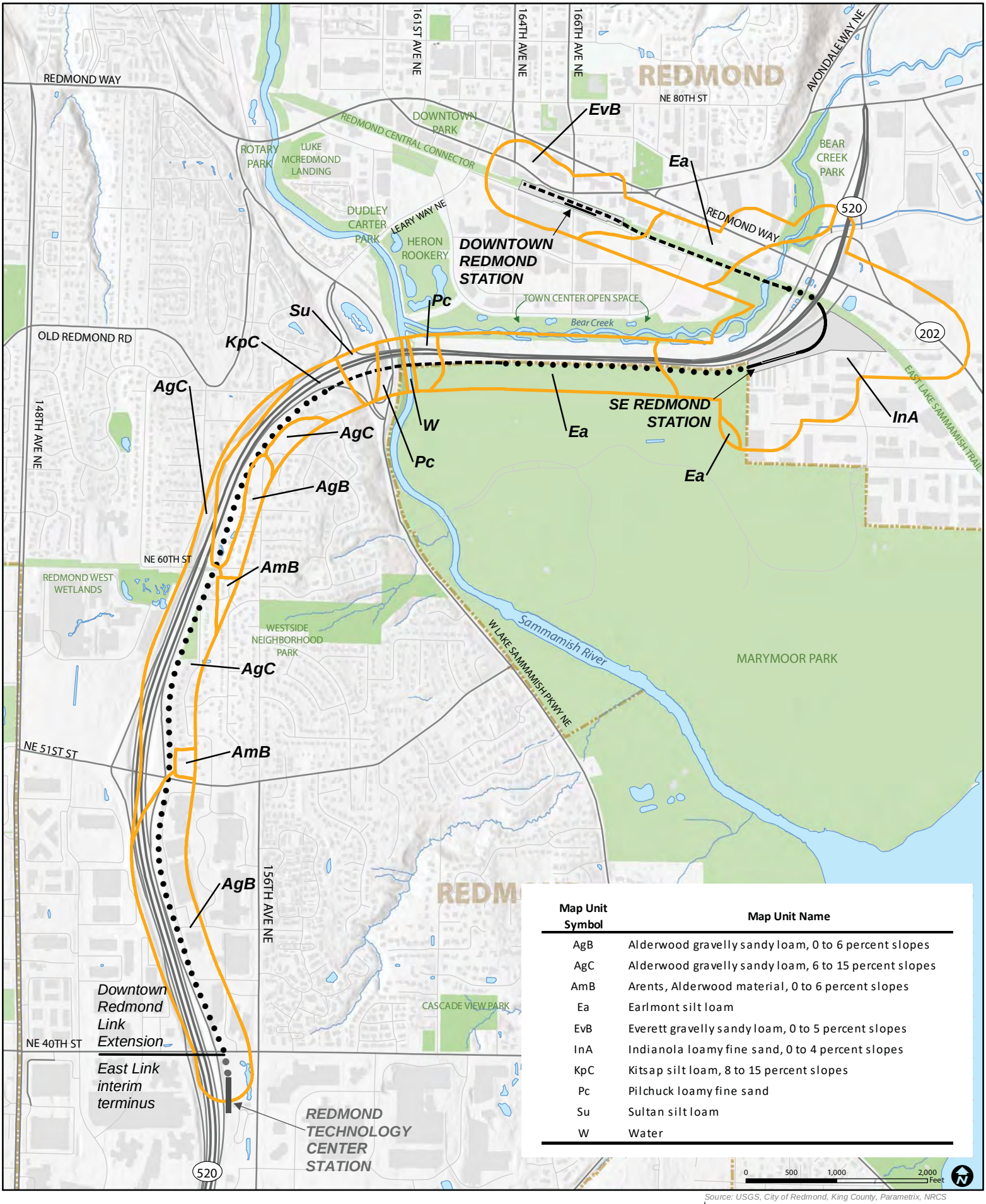
The Indianola series consists of very deep, somewhat excessively drained soils formed in sandy glacial drift located on hills, terraces, terrace escarpments, eskers, and kames of drift or outwash plains at elevations of near sea level to 1,000 feet (NRCS 2017). This soil type typically does not have hydric soil conditions unless associated with a water body or localized depression.

The Earlmont series consists of very deep, somewhat poorly drained soils formed in diatomaceous earth. It is listed as a soil with a high likelihood of hydric soil conditions. However, this portion of the soil series is indicated as having been drained (NRCS 2017).



Source: USGS, City of Redmond, King County, Parametrix, NWI

Figure 3-3
Previously Mapped Wetlands
Downtown Redmond Link Extension



Map Unit Symbol	Map Unit Name
AgB	Alderwood gravelly sandy loam, 0 to 6 percent slopes
AgC	Alderwood gravelly sandy loam, 6 to 15 percent slopes
AmB	Arents, Alderwood material, 0 to 6 percent slopes
Ea	Earlmont silt loam
EvB	Everett gravelly sandy loam, 0 to 5 percent slopes
InA	Indianola loamy fine sand, 0 to 4 percent slopes
KpC	Kitsap silt loam, 8 to 15 percent slopes
Pc	Pilchuck loamy fine sand
Su	Sultan silt loam
W	Water

Alignment
- At-Grade
- Elevated
- Retained Cut/Fill

Station Platform
Station Area
Soils

Source: USGS, City of Redmond, King County, Parametrix, NRCS

Figure 3-4
Mapped Soils
Downtown Redmond Link Extension

The Alderwood series comprises moderately well-drained soils located on glacially modified hills and ridges.

The Everett series consists of very deep, somewhat excessively drained soils that formed in gravelly and sandy glacial outwash (NRCS 2017).

Other soil types mapped within the study area are Arents, Alderwood material (0 to 6 percent slopes), Kitsap silt loam (8 to 15 percent slopes), Pilchuck loamy fine sand, and Sultan silt loam (see Figure 3-4). Arents, Alderwood material consists of moderately well-drained basal till located on till planes. The Kitsap series comprises very deep, moderately well-drained soils formed in lacustrine sediments located on terraces and terrace escarpments. The Pilchuck series comprises very deep, excessively drained and somewhat excessively drained soils formed in gravelly and sandy alluvium located on floodplains. The Sultan series comprises very deep, moderately well-drained soils formed in recent alluvium on floodplains at elevations of near sea level to 120 feet (NRCS 2017). None of the soils listed above is considered hydric (NRCS 2017).

Soils are disturbed in much of the study area. Along the southern end of the project corridor, extensive grading associated with the building of SR 520 has removed the original soil profile. The soils were affected by cut and fill activities. Within Marymoor Park, historical hydric soils have been drained for many decades, originally to support agriculture.

3.1.4 Climate Data

Precipitation and stream gauging data were compiled and analyzed to characterize conditions observed in the field. Precipitation data were used to understand the hydrologic conditions observed in wetlands in comparison to typical conditions. Wetland delineations are calibrated to identify typical conditions (Environmental Laboratory 1987). Stream gauging data were used to identify ordinary high water for streams. The results of the analysis are presented in the subsections below.

3.1.4.1 Precipitation

Precipitation during early 2017 was well above average (see Figure 3-5), with the city of Redmond receiving over 200 percent of average annual rainfall during February and March (see Figure 3-5). In addition, snowfall in late January and early February was followed by warm rain-on-snow events that further elevated groundwater and surface water elevations well above typical conditions. As such, the evaluation of hydrology included observations later in the spring to differentiate hydrology resulting from excessive precipitation compared to typical conditions.

Precipitation in 2018 has been variable, with January and April receiving over 175 percent of average annual rainfall and March and May receiving less than 75 percent of average annual rainfall. February, on the other hand, was close to 100 percent of the normal amount of rainfall. Overall, the hydrology observed during 2018 was normal. Figure 3-5 shows the amount of precipitation recorded prior to (November, December, and January) and throughout the wetland investigations.

3.1.4.2 Stream Gauging

Stream gauging data collected by King County are presented in Figures 3-6 (Sammamish River) and 3-7 (Bear Creek). These data were used in conjunction with observations of water levels and high water indicators to estimate the OHWM extent and elevations of the streams in the study area. Stream gauge data suggest an ordinary high water flow discharge of approximately 1,000 cubic feet per second (cfs)

for the Sammamish River and approximately 650 cfs for Bear Creek, typical of an approximately 2-year return interval flow.

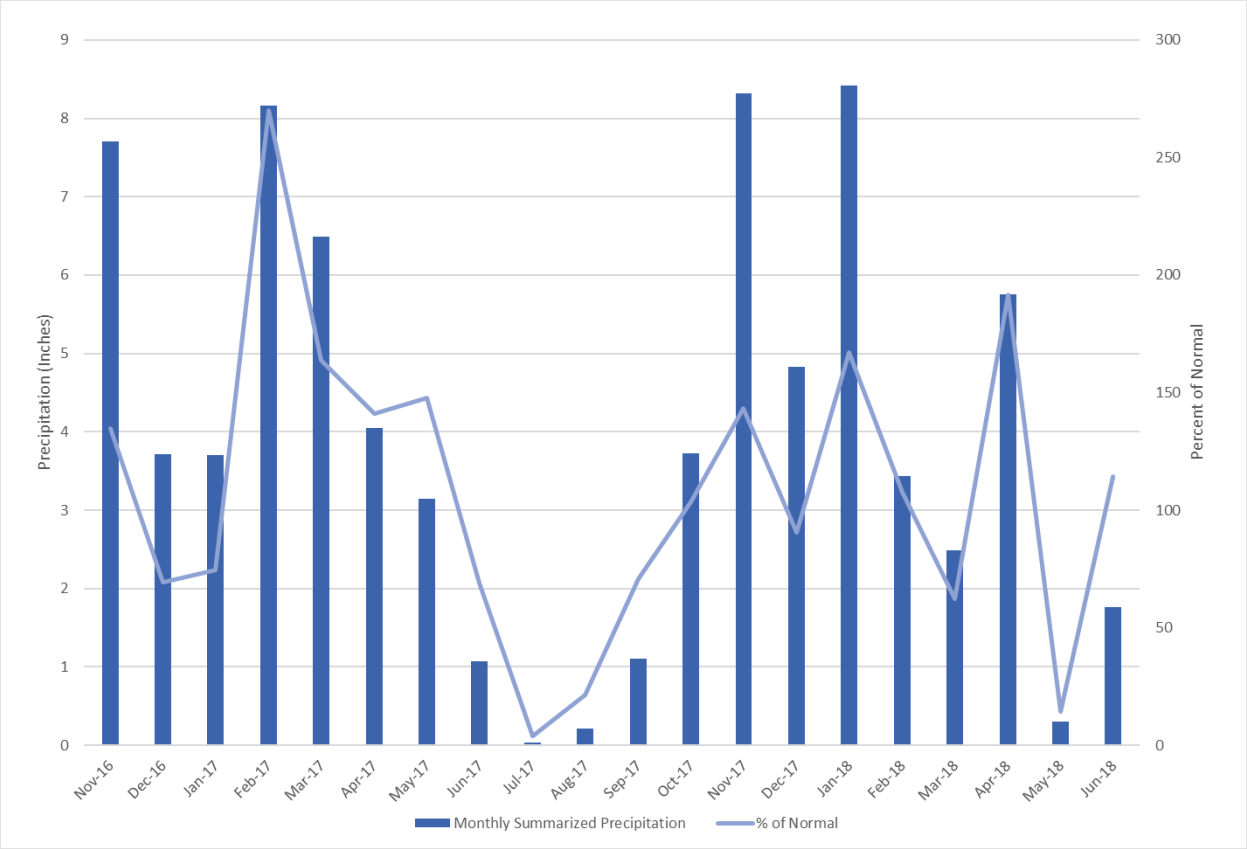


Figure 3-5. Precipitation Conditions during Wetland Surveys, 2017 and 2018

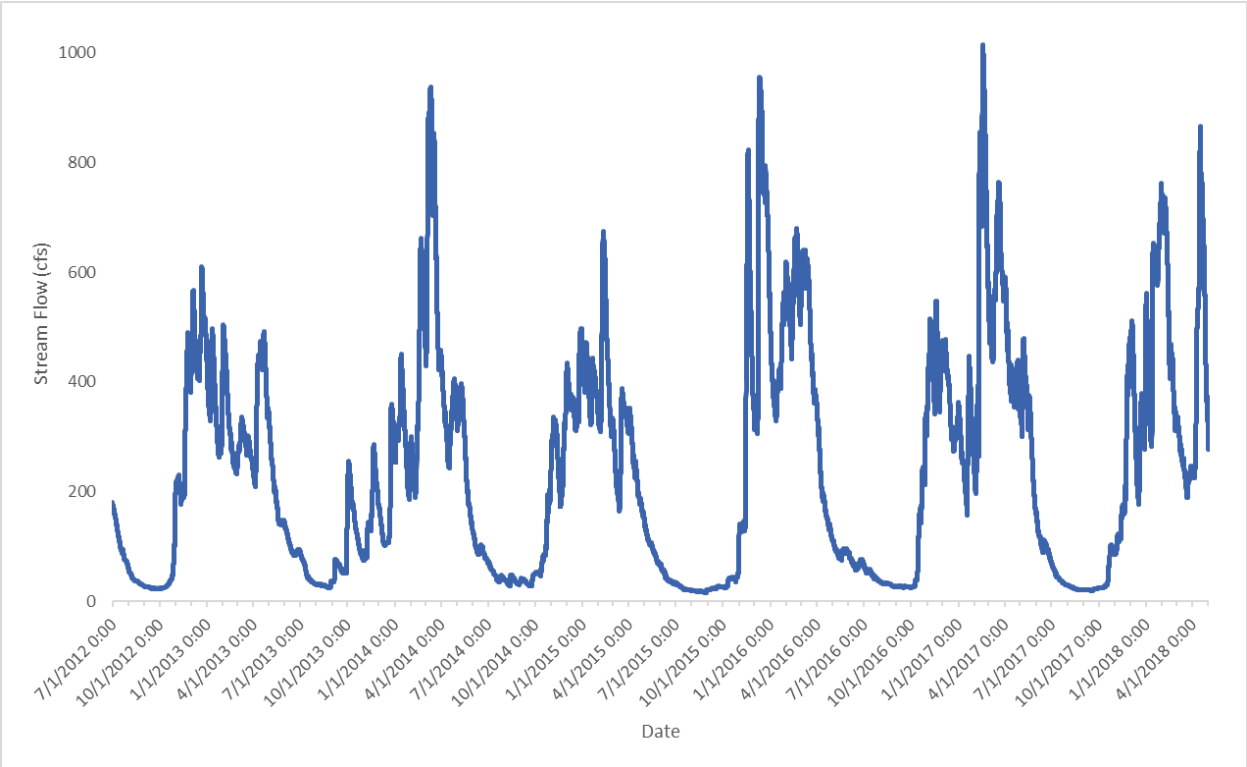


Figure 3-6. Sammamish River Stream Gauging Data 2012 through 2018 (King County)

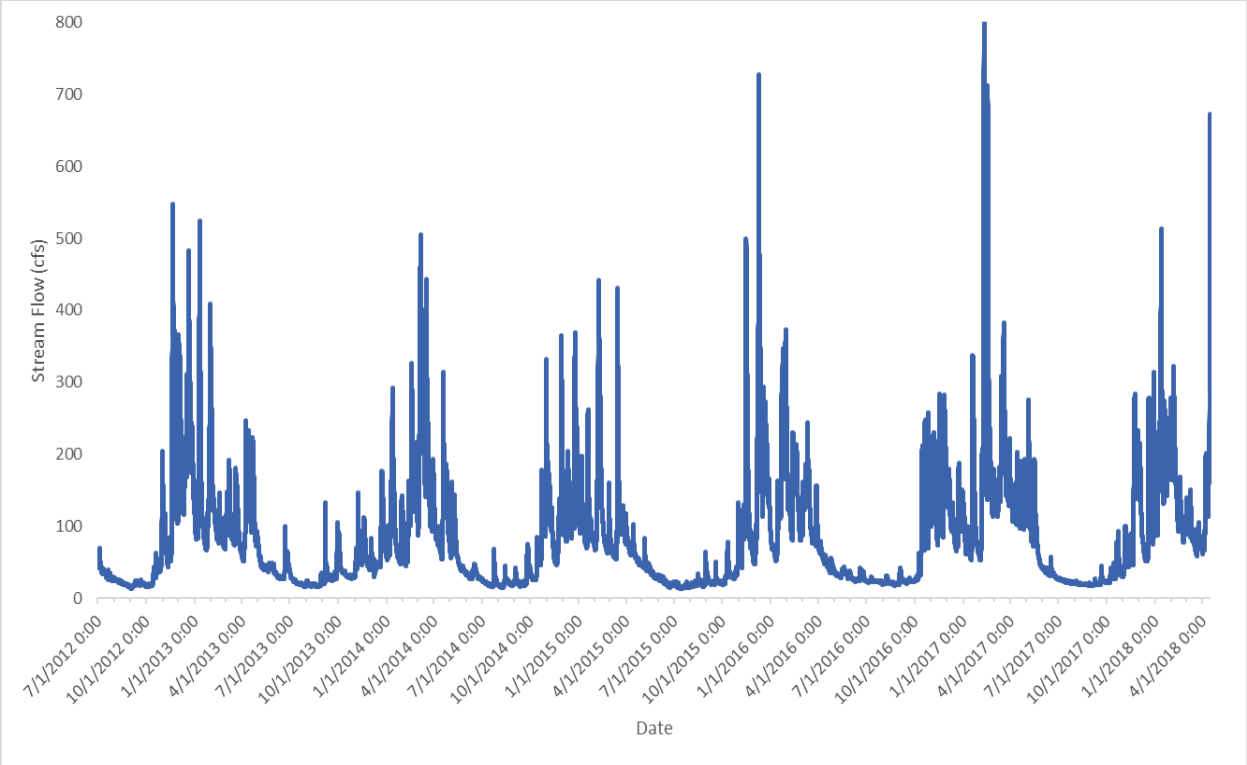


Figure 3-7. Bear Creek Stream Gauging Data 2012 through 2018 (King County)

3.2 Field Investigation

Eleven wetlands and four streams were delineated and surveyed (Tables 3-2 and 3-3; Figures 3-8A, 3-8B, 3-8C, and 3-8D). A detailed discussion of wetland and stream conditions is presented in the sections that follow.

In comparison to previously mapped wetlands (see Figure 3-3), wetlands that were delineated are similar in the Bear Creek corridor, very different in Marymoor Park, and hydrologically similar (but altered) along SR 520, west of the Sammamish River. In Marymoor Park, a narrow palustrine emergent wetland was previously mapped by NWI about 700 feet east of the Sammamish River. There are sections of swales in this area, some over 3 feet deeper than the surrounding area, but they lacked wetland hydrology, even during very wet periods in early spring. A large wetland in the park (named WKC-3 in this report) was not previously mapped.

Along SR 520 west of the Sammamish River, hydrologic and soil conditions are complicated by the construction and reconstruction of the highway and associated stormwater systems. Previously mapped streams currently express as a small section of stream (named unnamed tributary to the Sammamish River in this report) that has not been piped. A network of ditches and swales that meet wetland technical criteria occur in this area. However, the highly modified landscape in which they occur, large volumes of cut and fill material, a lack of mapped hydric soils, and uncertainties regarding previously existing conditions complicate determinations in this area, and are discussed separately (Section 3.2.1).

Table 3-2. Summary of Wetlands in the Study Area

Wetland	Area (acres)	USFWS Classification[a]	HGM Classification[b]	Ecology Rating (2004)[c]	Ecology Rating (2014)[d]	Local Jurisdiction Category	Standard Buffer Width (feet)
WRE-1	0.02	PEM	Slope	N/A	IV	IV[e]	50[f]
WRE-2	0.01	PSS	Slope	N/A	IV	IV[e]	50[f]
WRE-3	0.03	PFO	Depressional	N/A	IV	IV[e]	50[f]
WRE-4	0.08	PEM	Depressional	N/A	III	III[e]	80[f]
WKC-1	0.01	PSS	Riverine	III	III	III[g]	75[h]
WKC-2	0.01	PSS	Riverine	III	III	III[g]	75[h]
WKC-3	5.05	PFO/SS/EM	Depressional	III	III	III[g]	125[h]
WRE-5	>10	PFO/SS/EM	Riverine	N/A	I	I[e]	150[f]
WRE-6	0.43	PFO/SS	Riverine	N/A	I	I[e]	150[f]
WRE-7	>5	PFO/SS/EM	Riverine	N/A	I	I[e]	150[f]
WRE-8	1.01	PFO/SS/EM	Depressional	N/A	II	II[e]	150[f]
WRE-9	0.01	PFO	Depressional	N/A	III	III[e]	80[f]

[a] FGDC 2013; Cowardin et al. 1979

[b] Brinson 1993

[c] Hruby 2004

[d] Hruby 2014

[e] RZC 21.64.030(A)

[f] RZC Table 21.64.030(A)

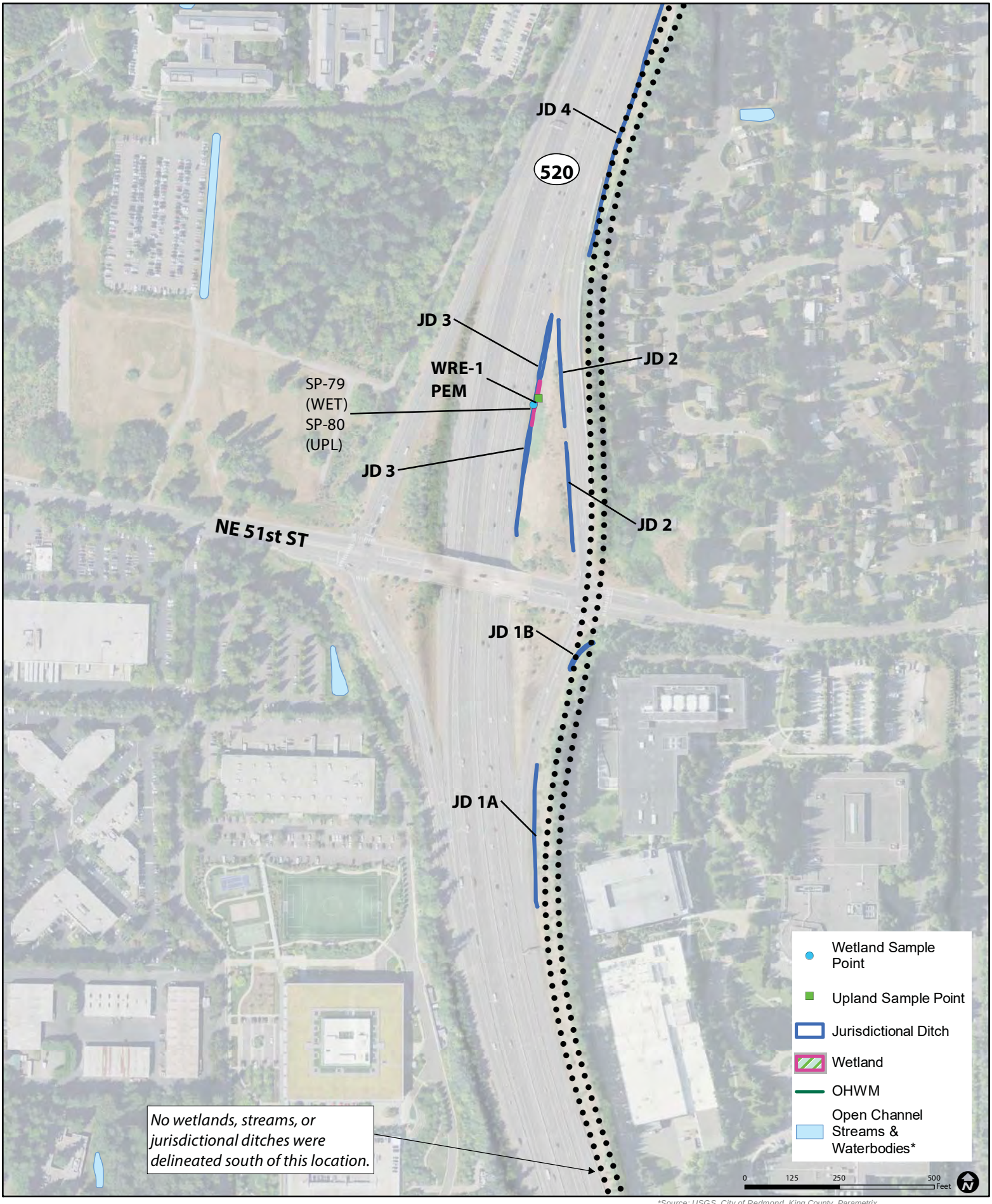
[g] KCC 21A.24.318(A)

[h] KCC 21A.24.325(A)(1)

PEM = palustrine emergent; PFO = palustrine forested; PSS = palustrine scrub-shrub

Table 3-3. Summary of Wetland Functions in the Study Area as Assessed by the Ecology 2004 and 2014 Rating Systems

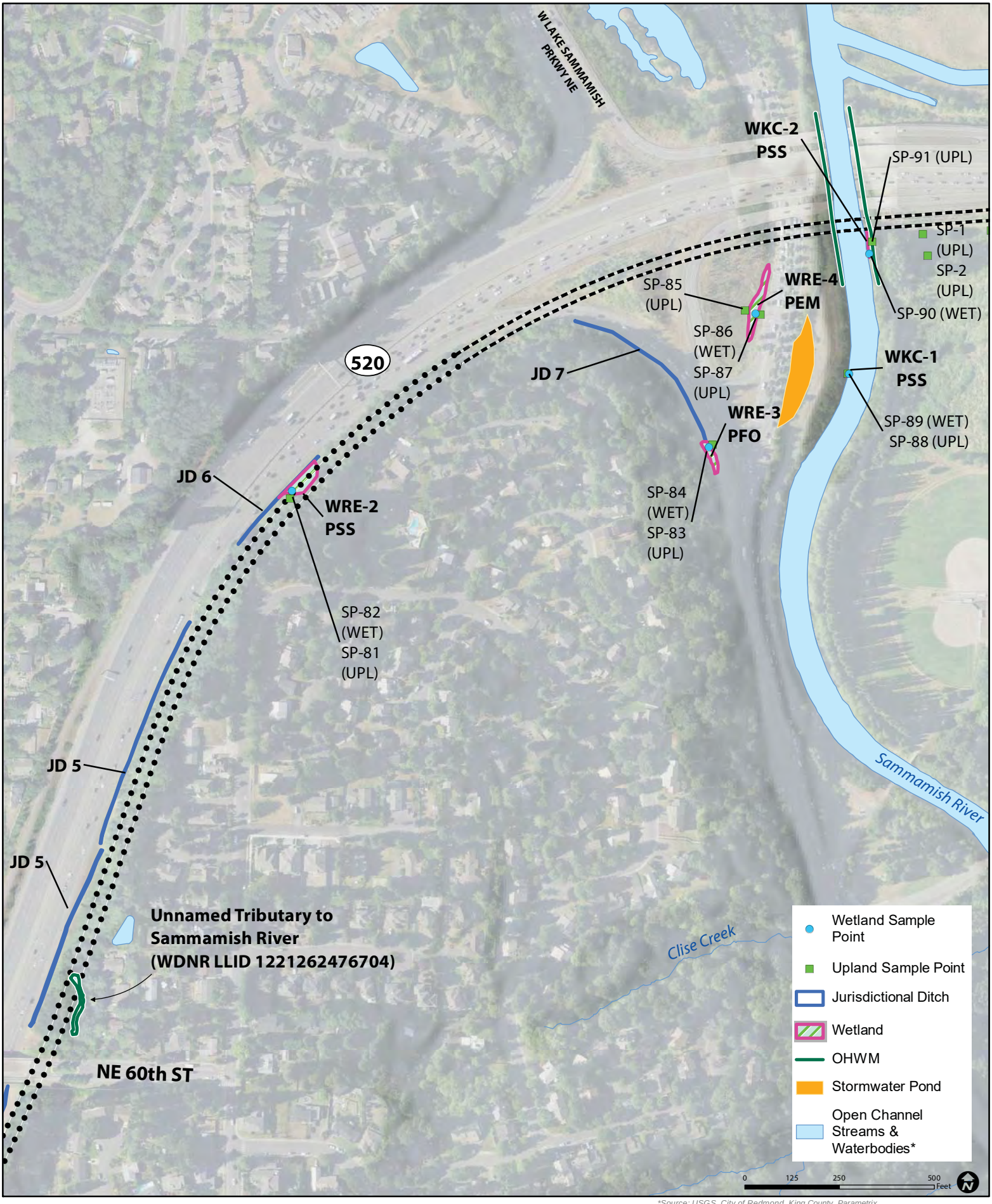
Wetland	Water Quality Functions (2004)	Water Quality Functions (2014	Hydrologic Functions (2004)	Hydrologic Functions (2014)	Habitat Functions (2004)	Habitat Functions (2014)	Overall Functions (2004)	Overall Functions (2014)
WRE-1	n/a	Medium (6)	n/a	Low (4)	n/a	Low (4)	n/a	Low (14 = Category IV)
WRE-2	n/a	Medium (6)	n/a	Low (4)	n/a	Low (3)	n/a	Low (13 = Category IV)
WRE-3	n/a	Medium (6)	n/a	Medium (5)	n/a	Low (4)	n/a	Low (15 = Category IV)
WRE-4	n/a	Medium (7)	n/a	Medium (5)	n/a	Low (4)	n/a	Medium-Low (16 = Category IIII)
WKC-1	Medium (16)	High (8)	Medium (16)	Medium (6)	Medium (13)	Low (5)	Medium (45 = Category III)	Medium-Low (19 = Category III)
WKC-2	Medium (16)	High (8)	Medium (16)	Medium (6)	Medium (13)	Low (5)	Medium (45 = Category III)	Medium-Low (19 = Category III)
WKC-3	Medium-High (18)	High (7)	Medium (10)	Medium (6)	Medium-High (22)	Medium (6)	Medium (50 = Category III)	Medium-Low (19 = Category III)
WRE-5	n/a	High (9)	n/a	High (8)	n/a	Medium (7)	n/a	High (24 = Category I)
WRE-6	n/a	High (9)	n/a	High (8)	n/a	Medium (7)	n/a	High (24 = Category I)
WRE-7	n/a	High (8)	n/a	High (8)	n/a	Medium (7)	n/a	High (23 = Category I)
WRE-8	n/a	Medium (7)	n/a	High (8)	n/a	Medium (6)	n/a	Medium-High (21 = Category II)
WRE-9	n/a	Medium (6)	n/a	Medium (5)	n/a	Medium (6)	n/a	Medium-low (17=Category III)



*Source: USGS, City of Redmond, King County, Parametrix

Alignment
- At-Grade
- Elevated
- Retained Cut/Fill
- Station Platform

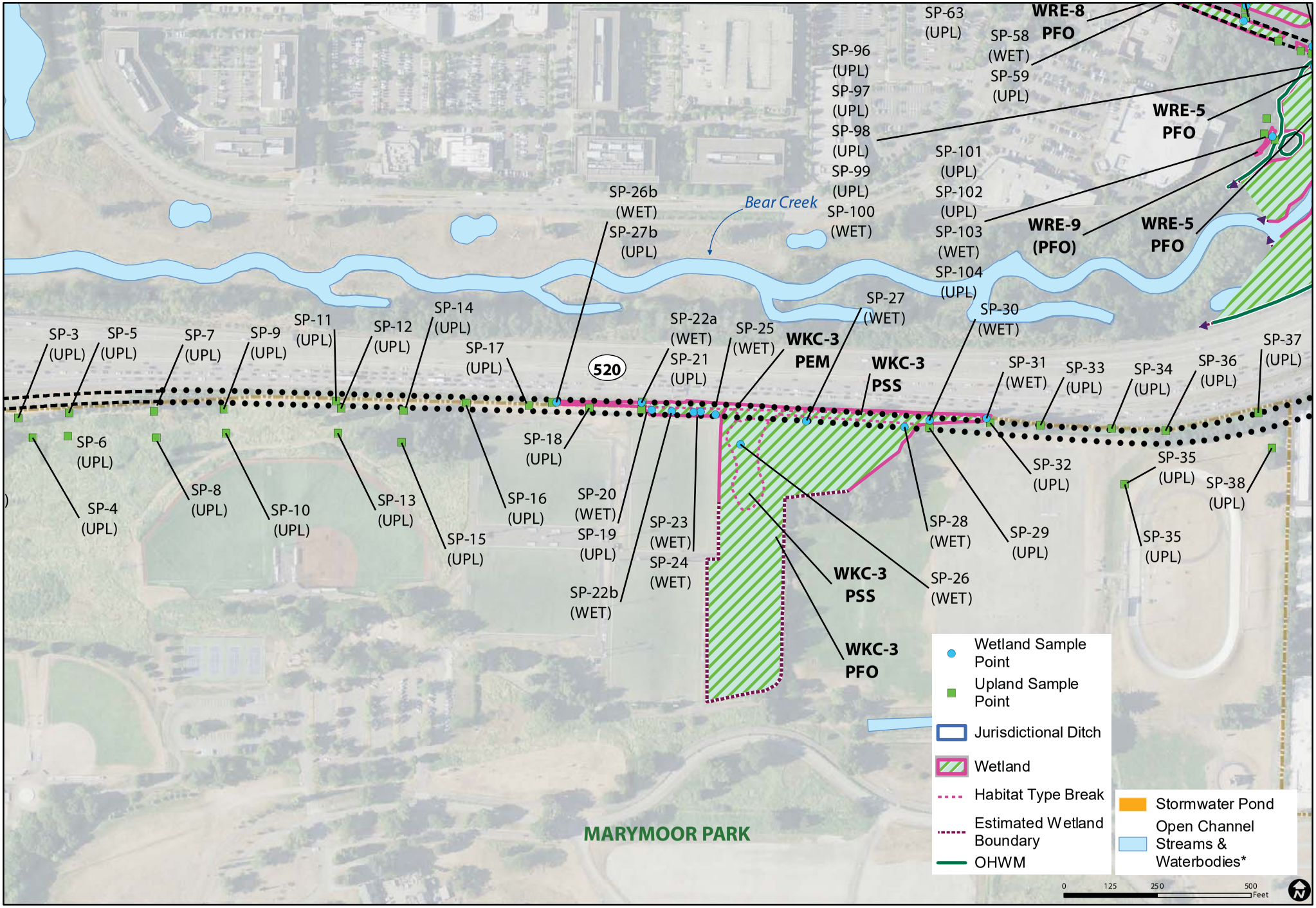
Figure 3-8A
Delineated Wetlands and Stream OHWM
Downtown Redmond Link Extension



*Source: USGS, City of Redmond, King County, Parametrix

Alignment
- At-Grade
- Elevated
- Retained Cut/Fill
- Station Platform

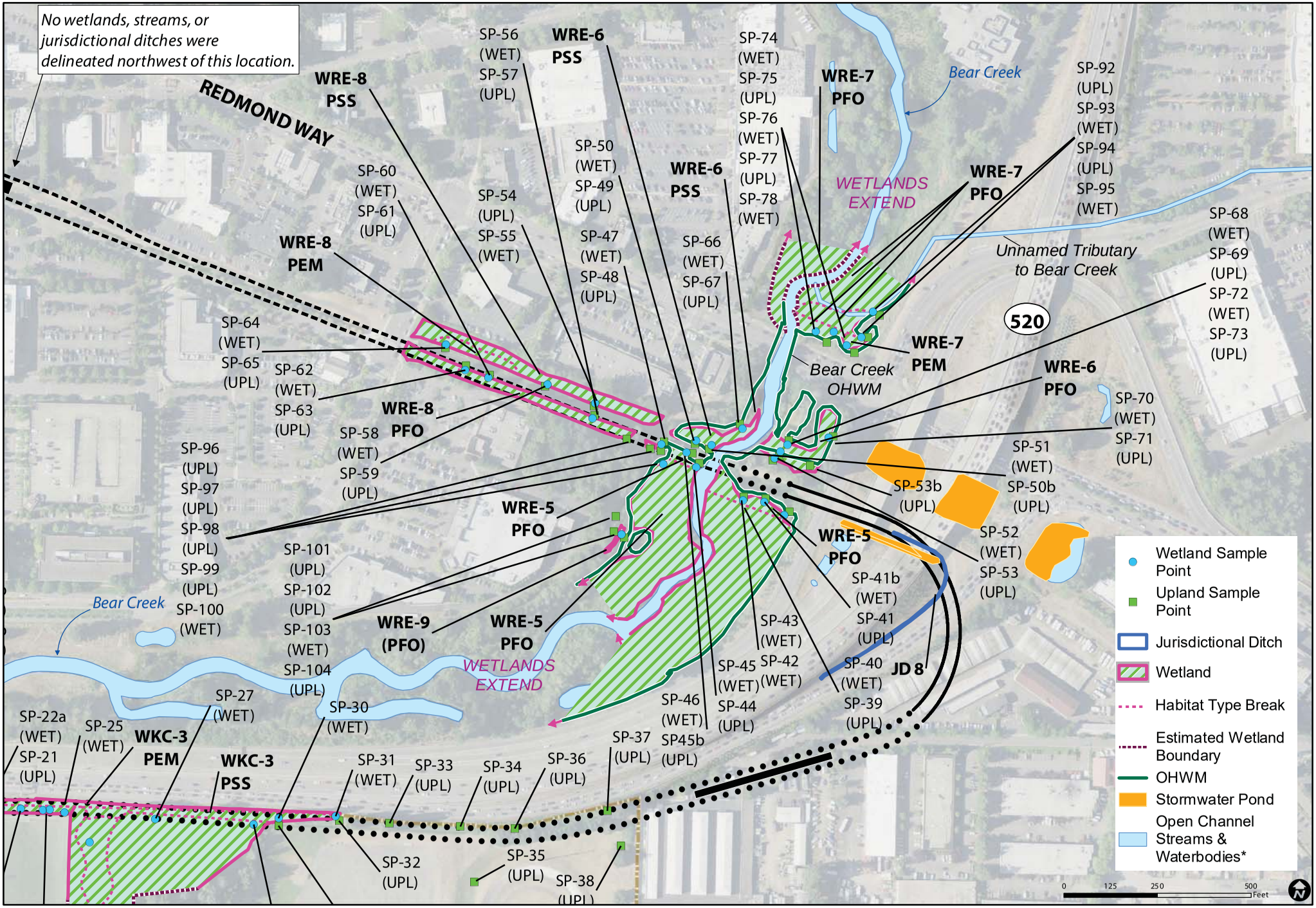
Figure 3-8B
Delineated Wetlands and Stream OHWM
Downtown Redmond Link Extension



Alignment
- At-Grade
- Elevated
- Retained Cut/Fill
- Station Platform

*Source: USGS, City of Redmond, King County, Parametrix

Figure 3-8C
Delineated Wetlands and Stream OHWM
Downtown Redmond Link Extension



Alignment
- At-Grade
- Elevated
- Retained Cut/Fill

Station Platform

*Source: USGS, City of Redmond, King County, Parametrix

Figure 3-8D
Delineated Wetlands and Stream OHWM
Downtown Redmond Link Extension

3.2.1 Stormwater Features and Ditches Associated with SR 520

Numerous ditches, swales, ponds, and stormwater infiltration features have been installed as part of the original construction and subsequent reconstructions of SR 520 in the study area. Many of these features were clearly designed to function as traditional stormwater features, such as maintained ponds and swales. Large features, such as stormwater ponds, are mapped as such in Figure 3-8B. In addition, there is an extensive network of ditches along the southern side of SR 520 from the Overlake Transit Center to the Sammamish River crossing that both convey stormwater and intercept groundwater seepages from the slopes to the south. Many of these areas met technical criteria for wetlands based on vegetation, soil color, and hydrology that were more persistent than stormwater flows and had significant groundwater inputs.

These features, at a minimum, meet the criteria for jurisdictional ditches under criteria provided by the Corps (see Figure 3-8B and the Jurisdictional Ditch Memorandum, Attachment C.4). A thorough analysis of SR 520 construction and reconstruction drawings would be beneficial to establishing the jurisdictional status of these features.

3.2.2 Wetlands

Attributes of the delineated wetlands are summarized in Table 3-2 and described in the subsections that follow. Wetland ratings and functional assessments are presented in Table C.2-1 in Attachment C.2. Details of the wetland sample plots are provided in Attachment C.1. Wetland Determination Forms are provided in Attachment C.2. Wetland Rating Form figures are included in Attachment C.3. A jurisdictional ditch analysis is presented in Attachment C.4. A list of plant species identified in this report, with the scientific names, is provided in Attachment C.5.

3.2.2.1 Wetland WRE-1

Size: 0.02 acre
USFWS Classification: Palustrine Emergent
HGM Classification: Slope
Local Jurisdiction: City of Redmond
Local Rating: Category IV
Sample Plots: SP-79 (WET), SP-80 (UPL)

Wetland WRE-1 is located east of eastbound SR 520 and north of NE 51st Street (see Figure 3-8A). The wetland is positioned in a roadside ditch (PJD 3) and extends approximately 10 feet upslope to the east before transitioning to uplands. This wetland boundary is defined by the extent of seeps and an expression of groundwater. Water from the wetland discharges to a roadside ditch (PJD 3).

Wetland hydrology is supported by groundwater expression and seeps as well as overland flow. Water generally moves through the wetland from east to west before discharging to PJD 3. Soil saturation and a high water table were observed in the wetland.

Wetland WRE-1 is vegetated with an emergent plant community. Vegetation within the wetland includes cattail, soft rush, giant horsetail, colonial bentgrass, and bird's-foot trefoil (Figure 3-9).

Soil was examined to a depth of 16 inches and consists of three layers. The top layer is a 3-inch very dark grayish brown (10YR 3/2) loam. The middle layer is a 4-inch dark grayish brown (2.5Y 4/2) loam with brown (7.5YR 4/4) and dark yellowish brown (10YR 4/6) redoximorphic features. Below 7 inches, the soil is gray (2.5Y 5/1) clay loam with strong brown (7.5YR 4/6) and gray (N 5/) redoximorphic features. Soils meet the *depleted matrix* hydric soil indicator. Soils in the wetland are mapped as Alderwood gravelly sandy loam by the NRCS (USDA 2017).

The vegetated component of the buffer surrounding Wetland WRE-1 is a mix of non-native vegetation including colonial bentgrass, Himalayan blackberry, common velvetgrass, giant horsetail, Kentucky bluegrass, cut-leaf geranium, and bird's foot trefoil.

Wetland WRE-1 is classified as palustrine emergent under the USFWS system and slope under the HGM system. Wetland WRE-1 scored 14 points using Ecology's 2014 rating system and therefore is rated a Category IV according to the City of Redmond (RZC 21.64.030) and Ecology (see Attachment C.2 and Table C.2-1). The City of Redmond requires a 50-foot buffer for Category IV wetlands with high impact land uses (RZC 21.64.030 (B)).

Functions provided by the wetland are low overall, as assessed by the Ecology Rating System, with 14 total points. Wetland WRE-1 scored 6 points (medium) for water quality functions. This steeply sloping wetland has a limited ability to detain and treat water. However, the dense herbaceous plants covering over half of the wetland intercept runoff and provide some treatment. The site is in proximity to pollutant sources such as SR 520. Because Wetland WRE-1 drains into a 303(d) list water body (the Sammamish River), the site has potential to improve water quality downstream. The wetland scored 4 points (medium) for hydrologic function. Wetland WRE-1 is located near a runoff source that increases flood control potential, and the site contains insufficient rigid vegetation to reduce surface flow. Flooding downstream of Wetland WRE-1 is not recognized as an issue and the site is not included in a flood control plan. Wetland WRE-1 has a low habitat function score of 4 points. The site has only an emergent vegetation class and a saturation water regime; therefore, it has little habitat complexity. No special habitat features were observed at the site and the proximity to major roads limits habitat connectivity.

Figure 3-9. Wetland WRE-1 photographed adjacent to SR 520, north of NE 51st Street

3.2.2.2 Wetland WRE-2

Size: 0.01 acre
USFWS Classification: Palustrine Scrub-Shrub
HGM Classification: Slope
Local Jurisdiction: City of Redmond
Local Rating: Category IV
Sample Plots: SP-82 (WET), SP-81 (UPL)

Wetland WRE-2 is located at the toe of a steep slope east of SR 520, north of NE 60th Street (see Figure 3-8B). Groundwater springs emerge approximately 20 feet above the toe of slope. The wetland boundary is defined by the limits of groundwater expression and the presence of hydric soils. Uphill and laterally from the wetland, soils lack hydric characteristics and there is no wetland hydrology. Downhill of the wetland, water discharges into a non-wetland roadside ditch (PJD 6).

Groundwater expression supports the wetland hydrology. The wetland outlets to a ditch along SR 520 (PJD 6). A high water table and soil saturation was observed in the wetland.

Wetland WRE-2 is vegetated with a scrub-shrub plant community. Vegetation within the wetland includes Nootka rose, red alder saplings, Himalayan blackberry, lady fern, giant horsetail, and creeping buttercup (Figure 3-10).

Soil was examined to a depth of 16 inches and consists of two layers. The top layer is a 5-inch very dark brown (10YR 2/2) loam. The lower layer is a dark gray (2.5Y 4/1) gravelly sandy clay loam with dark grayish brown (2.5Y 4/2) and dark yellowish brown (10YR 3/6) redoximorphic features. Soils meet the *depleted matrix* hydric soil indicator. Soils in the wetland are mapped as Kitsap silt loam by NRCS (USDA 2017).

The vegetated component of the buffer surrounding Wetland WRE-2 is a mix of forest, shrubs, and herbaceous vegetation including red alder, big-leaf maple, snowberry, vine maple, beaked hazelnut, Himalayan blackberry, Robert geranium, and periwinkle.

Wetland WRE-2 is classified as palustrine scrub-shrub under the USFWS system and slope under the HGM system. Wetland WRE-2 scored 13 points using Ecology's 2014 rating form and, therefore, is rated a Category IV according to the City of Redmond (RZC 21.64.030) and Ecology (see Attachment C.2 and Table C.2-1). The City of Redmond requires a 50-foot buffer for Category IV wetlands with high impact land uses (RZC 21.64.030 (B)).

Functions provided by the wetland are low overall, as assessed by Ecology's Rating System, with 13 total points. Wetland WRE-2 scored 6 points (medium) for water quality functions. This seep wetland is located near the base of a gradual slope and is adjacent to SR 520. The site intercepts surface water runoff and discharges directly into a 303(d) list water body (the Sammamish River), thus offering potential water quality improvements downstream. Wetland WRE-2 has a low hydrologic function score of 4 points. The site contains some rigid vegetation to slow surface flow velocity, and downstream areas are not recognized as having flood problems. For habitat function, Wetland WRE-2 scored a low 3 points. The site consists of only a single scrub-shrub vegetation class and saturation water regime, with no special habitat features. Habitat connectivity is limited by adjacent residential housing and SR 520.

Figure 3-10. Wetland WRE-2 photographed adjacent to SR 520

3.2.2.3 Wetland WRE-3

Size: 0.03 acre
USFWS Classification: Palustrine Forested
HGM Classification: Depressional
Local Jurisdiction: City of Redmond
Local Rating: Category IV
Sample Plots: SP-84 (WET), SP-83 (UPL)

Wetland WRE-3 is positioned in a depression between SR 520 road fill and a steep slope, south of the SR 520 eastbound off-ramp to West Lake Sammamish Parkway NE (see Figure 3-8B). The wetland boundary is defined to the north and northeast (uphill to roadway) by the limits of the road fill prism, and by a shift to upland soils and lack of wetland hydrology to the south and west. Vegetation also changes along these boundaries from a dominance of hydrophytes to a community dominated by upland species (e.g., big-leaf maple, Douglas-fir, and sword fern).

Wetland hydrology is supported by seeps, localized overland flow, and discharge from a roadside ditch (PJD 7) into the wetland. The discharge from the roadside ditch has resulted in small areas of channelized flow in the wetland. The outlet is a grated, partially constricted drainage system at the southern extent of the wetland. A high water table, shallow inundation, and soil saturation were observed in the wetland.

Wetland WRE-3 is vegetated with a forested plant community. Vegetation within the wetland includes western red cedar, red alder, salmonberry, Himalayan blackberry, giant horsetail, and lady fern (Figure 3-11).

Soil was examined to a depth greater than 18 inches and consists of one layer. The examined layer is a very dark brown (10YR 2/2) silty clay loam with gray (5Y 5/1), strong brown (7.5YR 4/6), and gray (N 5/) redoximorphic features. Soils meet the *redox dark surface* hydric soil indicator. Soils in the wetland are mapped as Pilchuck loamy fine sand by the NRCS (USDA 2017).

The vegetated component of the buffer surrounding Wetland WRE-3 is primarily forested with red alder, Douglas-fir, and big-leaf maple, with an understory comprising snowberry, vine maple, Himalayan blackberry, beaked hazelnut, and sword fern.

Wetland WRE-3 is classified as palustrine forested under the USFWS system and depressional under the HGM system. Wetland WRE-3 scored 15 points using Ecology's 2014 rating system and is rated a Category IV according to the City of Redmond (RZC 21.64.030) and Ecology (see Attachment C.2 and Table C.2-1). The City of Redmond requires a 50-foot buffer for Category IV wetlands with high impact land uses (RZC 21.64.030 (B)).

Functions provided by the wetland are moderate overall, as assessed by the Ecology Rating System, with 15 total points. Wetland WRE-3 scored 6 points (moderate) for water quality functions. Discharges of untreated stormwater from West Lake Sammamish Parkway NE and the proximity of urban development increase the potential for water quality improvement. The site has intermittently ponds, but persistent ungrazed vegetation covers over half of the wetland and assists in water treatment. Wetland WRE-3 scored 5 points (moderate) for hydrologic functions. Contributions of Wetland WRE-3 to flood storage in the landscape are low; the site has low ponding capabilities and encompasses a small portion of its watershed. Wetland WRE-3 does provides some hydrologic function by intercepting stormwater discharges and potentially reducing flooding downstream. The habitat functional score for the site is 4 points (low). Wetland WRE-3 contains only a forest vegetation community and a saturation water regime with large woody debris habitat features. Proximity to major roads and residential housing

limits habitat contiguity; however, a wide vegetated corridor connects Wetland WRE-3 to a large forested open area that provides good connectivity to diverse habitats.

Figure 3-11. WRE-3 photographed to the east and south of SR 520, and west of West Lake Sammamish Parkway NE

3.2.2.4 Wetland WRE-4

Size: 0.08 acre
USFWS Classification: Palustrine Emergent
HGM Classification: Depressional
Local Jurisdiction: City of Redmond
Local Rating: Category III
Sample Plots: SP-85 (UPL), SP-86 (WET), SP-87 (UPL)

Wetland WRE-4 is in a linear depression positioned in the SR 520 interchange with West Lake Sammamish Parkway NE (see Figure 3-8B). The wetland extends from toe-slope seeps down to the road fill associated with West Lake Sammamish Parkway NE, where water impounds against the fill prism.

Wetland hydrology is supported by seeps and surface flow from the adjacent roadways and slope. The outlet is a catch basin that allows 1 to 2 feet of impoundment in the wetland during storms. A high water table, shallow inundation and sheet flow, and soil saturation were observed in the wetland.

Wetland WRE-4 is vegetated with an emergent community. Vegetation within the wetland is composed of meadow foxtail, reed canarygrass, Himalayan blackberry, and common rush (Figure 3-12).

Soil was examined to a depth greater than 16 inches and consists of two layers. The topsoil is a 4-inch thick layer of black (10YR 2/1) sandy loam. This lies over a subsoil at least 12 inches thick composed of gray (2.5Y 5/1) gravelly sandy loam with dark yellowish brown (10YR 4/6) redoximorphic features. Soils meet the *depleted matrix* and *depleted below dark surface* hydric soil indicators. Soils in the wetland are mapped as Pilchuck loamy fine sand and Sultan silt loam by the NRCS (USDA 2017).

The vegetated component of the buffer surrounding Wetland WRE-4 is a mix of shrubs and herbaceous vegetation including incense cedar, vine maple, beaked hazelnut, snowberry, Nootka rose, giant horsetail, common nipplewort, narrow-leaf plantain, common bedstraw, a variety of non-native grasses, and Robert geranium.

Wetland WRE-4 is classified as palustrine emergent under the USFWS system and depressional under the HGM system. Wetland WRE-4 scored 16 points on Ecology's 2014 rating system; therefore, it is rated a Category III according to the City of Redmond (RZC 21.64.030) and Ecology (see Attachment C.2 and Table C.2-1). The City of Redmond requires an 80-foot buffer for Category III wetlands with high impact land uses (RZC 21.64.030 (B)).

Functions provided by the wetland are low overall, as assessed by Ecology's Rating System, with 16 total points. Wetland WRE-4 scored 7 points (moderate) for water quality functions. The constricted outlet of the site contributes to seasonal ponding of a quarter of the total wetland area, slowing the water and allowing for treatment time. Major roads surround Wetland WRE-4 on all sides and discharge surface water runoff into the wetland providing opportunities for treatment. Hydrologic functions of Wetland WRE-4 scored 5 points (moderate). The site has high potential for surface water runoff catchment and retention; however, marks of ponding were observed at less than 0.5 feet even though the wetland could store 1 to 2 feet of water. Only an emergent vegetation class with less than five species is present at the site. Low plant diversity, lack of habitat features, and lack of connectivity contribute to a low habitat score of 4 for Wetland WRE-4.

Figure 3-12. Wetland WRE-4 photographed to the west of West Lake Sammamish Parkway NE

3.2.2.5 Wetland WKC-1

Size: 0.01 acre
USFWS Classification: Palustrine Scrub-Shrub
HGM Classification: Riverine
Local Jurisdiction: King County
Local Rating: Category III
Sample Plots: SP-88 (UPL), SP-89 (WET)

Wetland WKC-1 is located on a riverine bench on the west (left) bank of the Sammamish River in Marymoor Park (see Figure 3-8B). It is part of a restoration area completed by WSDOT related to SR 520 improvement projects. The wetland boundary is defined on the uphill (west) side by a change in soil and loss of wetland hydrology that coincides with the steep slopes of the riverbank. The east boundary is defined by a scoured river channel while the north and south boundary are defined by the end of the topographic bench the wetland is located upon.

Wetland hydrology is supported by seasonal high flows and an elevated water table associated with the Sammamish River. Oxidized rhizospheres were observed along living roots at and below 7 inches of the soil surface. The soil was saturated to the surface during sample plot data collection. It was observed to be flooded on several other occasions during March and April 2017.

Wetland WKC-1 is a scrub-shrub plant community. Vegetation within the wetland includes Scouler's willow, Himalayan blackberry, and reed canarygrass (Figure 3-13).

Soil was examined to a depth of 16 inches and consists of two layers. The top layer is a 2-inch very dark brown (10YR 2/2) silty clay loam. The middle layer is a gray (2.5Y 6/1) silty clay loam with strong brown (7.5YR 5/6) redoximorphic features. Soils meet the *depleted matrix* hydric soil indicator. Soils in the wetland are mapped as Pilchuck loamy fine sand by the NRCS (USDA 2017).

The vegetated component of the buffer surrounding Wetland WKC-1 is dominated by Himalayan blackberry. Wetland WKC-1 is classified as palustrine scrub-shrub under the USFWS system and riverine under the HGM system. Wetland WKC-1 was rated according to the 2004 Washington State Wetland Rating System for Western Washington—Revised (Hruby 2004), as specified in KCC 21A.24.318(A) and the 2014 Rating System (see Attachment C.2 and Table C.2-1). The wetland scored 45 points using the Ecology 2004 method, thereby qualifying as a Category III wetland (see Attachment C.2 and Table C.2-1). The KCC requires a wetland buffer width of 75 feet for Category III wetlands with habitat scores of 20 points or less (KCC 21A.24.325(A)(1)).

Functions provided by the wetland are moderate overall, as assessed by Ecology's Rating System, with 45 total points. The very small size of the wetland is below the calibration threshold for the rating system (Hruby 2004). Wetland WKC-1 scored 16 points (moderate) for water quality functions. No surface depressions are present on this riverine bench but a high proportion of shrubs assist with sediment trapping and erosion control. The site has the potential to improve water quality due to the proximity of 303(d)-listed Sammamish River and discharges from developed areas. Hydrologic functions for the site scored moderately with 16 points. A low stream-to-wetland ratio for the site limits overbank storage potential, but the high proportion of trees and shrubs assists in slowing floodwaters. The site has a high opportunity to reduce flooding and erosion downstream because protection is needed for human structures and natural resources downstream. Habitat functions scored a moderate 13 points for the site. The scrub-shrub vegetation community with low plant richness provides little habitat interspersion. Special habitat features include large undercut banks, and stable steep banks for denning. Buffers and wildlife corridors for Wetland WKC-1 are limited by buildings and paved surfaces.

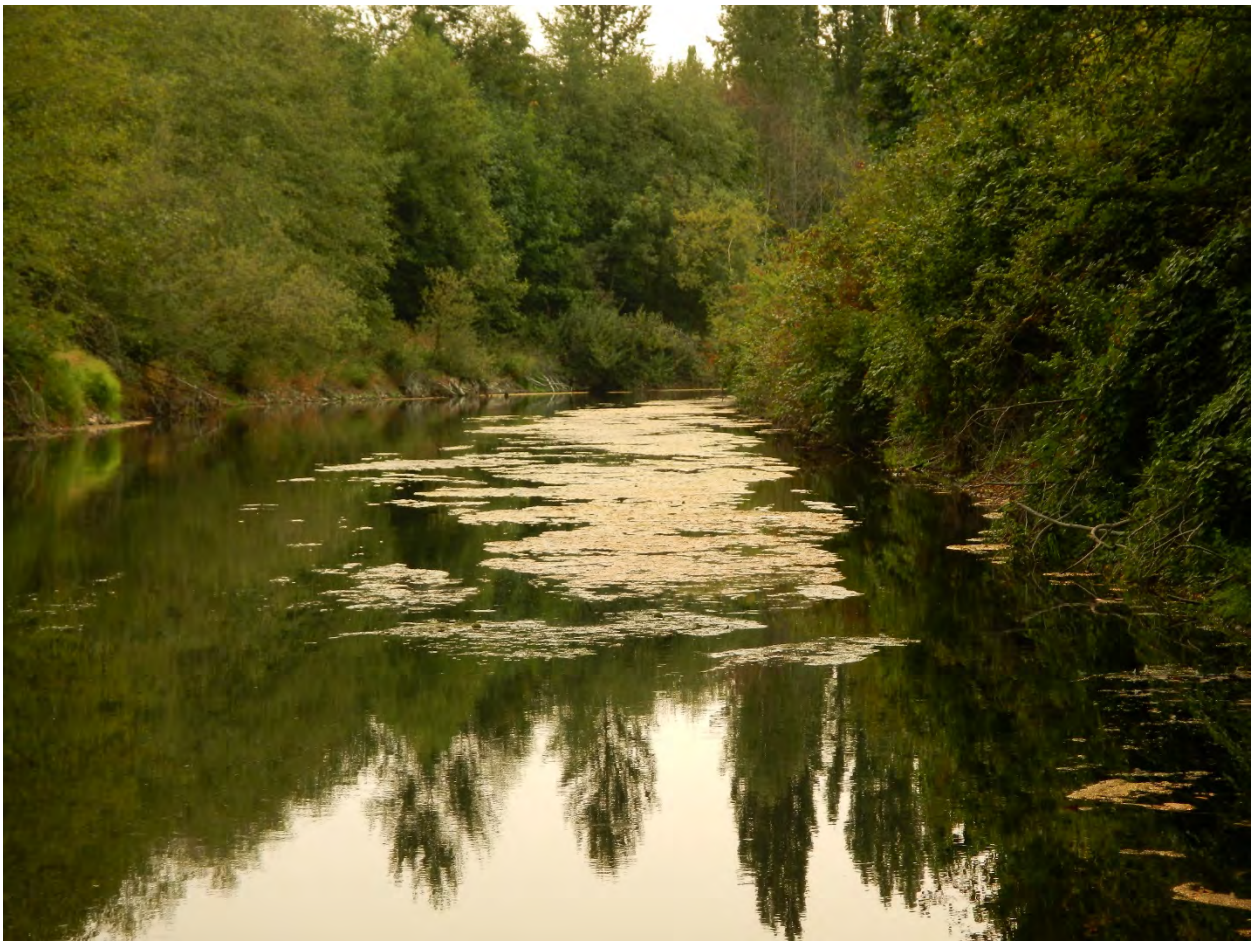


Figure 3-13. Wetland WKC-1 south of SR 520 and east of West Lake Sammamish Parkway NE

3.2.2.6 Wetland WKC-2

Size: 0.01 acre
USFWS Classification: Palustrine Scrub-Shrub
HGM Classification: Riverine
Local Jurisdiction: King County
Local Rating: Category III
Sample Plots: SP-91 (UPL), SP-90 (WET)

Wetland WKC-2 is located on a riverine bench on the east (right) bank of the Sammamish River in Marymoor Park. Similar to Wetland WKC-1, it is part of a restoration area completed by WSDOT related to SR 520 improvement projects. The wetland boundary is defined on the uphill (east) side by a sudden change in soil and hydrology that coincides with the steep slopes. These slopes lack hydric soils and wetland hydrology. The wetland boundary to the west (river side) is defined by the scoured river channel. The wetland boundary to the north and south is defined by the end of the topographic bench upon which the wetland is located.

Wetland hydrology is supported by seasonal high flows and water table associated with the Sammamish River. The site was observed flooded on several occasions in March and April. Oxidized rhizospheres were observed along living roots at and below 4 inches of the soil surface. The soil was saturated to the surface during sample plot data collection.

Wetland WKC-2 contains a scrub-shrub plant community. Vegetation within the wetland includes Scouler's willow, Sitka spruce, cut-leaf blackberry, Himalayan blackberry, and reed canarygrass (Figure 3-14).

Soil was examined to a depth of 20 inches and consists of three layers. The top layer is a 2-inch very dark brown (10YR 2/2) silty clay loam. The middle layers (2-5 inches and 5-7 inches) are gray (2.5Y 6/1) silty clay loam with varying amounts of strong brown (7.5YR 5/8) redoximorphic features. The lower layer is a dark gray (10YR 4/1) silt loam with strong brown (7.5YR 4/6) redoximorphic features. Soils meet the *depleted matrix* and *depleted below dark surface* hydric soil indicators. Soils in the wetland are mapped as Pilchuck loamy fine sand by the NRCS (USDA 2017).

The buffer surrounding Wetland WKC-2 is forested and consists of red alder, willow, Sitka spruce, red osier dogwood, western red cedar, Himalayan blackberry, and reed canarygrass.

Wetland WKC-2 is classified as palustrine scrub-shrub under the USFWS system and riverine under the HGM system. Wetland WKC-2 was rated according to the 2004 Washington State Wetland Rating System for Western Washington—Revised (Hruby 2004), as specified in KCC 21A.24.318(A) and the 2014 Rating System (see Attachment C.2 and Table C.2-1). The wetland scored 45 points using the Ecology 2004 method, thereby qualifying as a King County Category III wetland. The KCC requires a wetland buffer width of 75 feet for Category III wetlands with habitat scores of 20 points or less (KCC 21A.24.325(A)(1)).

Functions provided by the wetland are moderate overall, as assessed by Ecology's Rating System, with 45 total points. The very small size of the wetland is below the calibration threshold for the rating system (Hruby 2004). Water quality functions of Wetland WKC-2 scored a moderate 16 points. No surface depressions are present on this riverine bench but a high proportion of shrubs assist with sediment trapping and erosion control. The site has the potential to improve water quality due to proximity of 303(d)-listed Sammamish River and discharges from developed areas. Hydrologic functions for the site scored moderately with 16 points. A low stream-to-wetland ratio for the site limits overbank storage potential, but the high proportion of trees and shrubs assists in slowing floodwaters. The site

has a high opportunity to reduce flooding and erosion downstream because protection is needed for human structures and natural resources downstream. Habitat functions scored a moderate 13 points for the site. The scrub-shrub vegetation community with low plant richness provides little habitat interspersion. Special habitat features present include large undercut banks, and stable steep banks for denning. Buffers and wildlife corridors for Wetland WKC-2 are limited by buildings and paved surfaces.

Figure 3-14. Wetland WKC-2 and the Sammamish River photographed from the Sammamish River Trail south of SR 520

3.2.2.7 Wetland WKC-3

Size: approximately 5 acres (extends out of study area)
USFWS Classification: Palustrine Forested, Scrub-Shrub, and Emergent
HGM Classification: Depressional
Local Jurisdiction: King County
Local Rating: Category III
Sample Plots: SP-19 through SP-32

Wetland WKC-3 is located in a shallow depression adjacent to SR 520, along the northern perimeter of Marymoor Park. Several park-related playing fields flank the wetland—a soccer field to the west and a cricket field to the east (see Figure 3-8C). The site includes a King County mitigation area, constructed in 2001 for impacts in Marymoor Park (King County Parks 2017d). The wetland boundary is defined to the north by the extents of fill associated with SR 520; to the west by developed playfields; to the northwest by a loss of wetland hydrology; and to the east and southeast by a steep uphill topographic gradient and loss of wetland hydrology. The wetland boundary to the south is outside of the study area and was not delineated, but is assumed to be limited by the presence of a paved bicycle trail and associated fill.

Wetland hydrology is supported by a high groundwater table and surface water runoff from adjacent areas. Areas of ponded water were observed throughout the wetland in February through April. The southern half of the wetland appears to discharge to the south into adjacent wetland areas, but no outlet structure was observed. A high water table, inundation, and saturated soils were observed.

Wetland WKC-3 contains forested, scrub-shrub, and emergent plant communities. The forested plant community is dominated by Oregon ash, red alder, Sitka spruce, and black cottonwood with an understory of willow, reed canarygrass, and slough sedge. The scrub-shrub community is dominated by Douglas spiraea, willow, Nootka rose, red osier dogwood, and shore pine with an understory of reed canarygrass. The emergent community includes slough sedge, Kentucky bluegrass, and reed canarygrass (Figure 3-15).

Soil sampled at SP-28 (WET) is representative of the soils encountered in other portions of the wetland. At this location soil was examined to a depth of 18 inches and consists of four layers. The top layer is a 4-inch very dark grayish brown (10YR 3/2) clay. The second layer is a 2-inch-thick very dark grayish brown (10YR 3/2) clay loam. The third layer is a 2-inch-thick dark grayish brown (10YR 4/2) silt loam with yellowish red (5YR 4/6) redoximorphic features. The lower layer is a gray (2.5Y 5/1) silt loam with strong brown (7.5YR 4/6) redoximorphic features. Soils at SP-28 meet the *depleted matrix* and *depleted below dark surface* hydric soil indicators. Other sample points within the wetland met one or both of these indicators. Soils in the wetland are mapped as Earlmont silt loam by the NRCS (USDA 2017).

The vegetated component of the buffer surrounding Wetland WKC-3 is mostly mowed grass to the east and northwest consisting of Kentucky bluegrass and reed canarygrass. A small band of upland trees and shrubs between the mowed area and the wetland include non-native poplars, Douglas-fir, and osoberry. The buffer to the north is the vegetated shoulder of SR 520, including Himalayan blackberry and planted native species such as Pacific ninebark and red osier dogwood. There is no vegetated buffer to the west (artificially surfaced playfields).

Wetland WKC-3 is classified as palustrine forested, scrub-shrub, and emergent under the USFWS system and depressional under the HGM system. Wetland WKC-3 was rated according to the 2004 Washington State Wetland Rating System for Western Washington—Revised (Hruby 2004), as specified in KCC 21A.24.318(A) and the 2014 Rating System (see Attachment C.2 and Table C.2-1). The wetland scored 50 points using the Ecology 2004 method, thereby qualifying as a Category III wetland (see Attachment C.2

and Table C.2-1). The KCC requires a wetland buffer width of 125 feet for Category III wetlands with a habitat score above 20 points (KCC 21A.24.325(A)(1)).

Functions provided by the wetland are overall moderately high, as assessed by the 2004 Ecology Rating System, with 50 total points. Water quality functions for Wetland WKC-3 scored 18 points (moderately high). Discharges of untreated stormwater to the site and proximity of urban development increase the potential for water quality improvement for Wetland WKC-3. Seasonal ponding within a quarter of the wetland allows sediments to settle out from the water column. Persistent ungrazed vegetation comprises over 95 percent of the site and improves water quality through sediment trapping. The hydrologic functions score for the site is a moderate 10 points. The constrained outlet and ponding potential allow for greater surface water storage. Marks of ponding at the site measured between 0.5 and 2 feet. Because Wetland WKC-3 has a constrained outlet, surface water is detained, reducing downstream flooding. However, downstream flooding is not a significant issue; therefore, the wetland has limited opportunity to provide this function. The habitat score for the site is 22 points (moderately high). Multiple vegetation classes with high species diversity form a high interspersion of habitats at the site. Special habitat features include large woody debris, snags, and thin persistent vegetation. Buffers and wildlife corridors for Wetland WKC-3 are limited by roads and recreational development.

Figure 3-15. The palustrine forested and palustrine scrub-shrub component of Wetland WKC-3, positioned east of Marymoor Park Soccer Field 3

3.2.2.8 Wetland WRE-5

Size: Over 10 acres (large wetland extends off site)
USFWS Classification: Palustrine Forested, Scrub-Shrub, and Emergent
HGM Classification: Riverine
Local Jurisdiction: City of Redmond
Local Rating: Category I
Sample Plots: SP-39 (UPL) through SP-46 (WET)

Wetland WRE-5 is located in a floodplain on both banks of Bear Creek in the city of Redmond. As mapped by the City of Redmond (City of Redmond 2017), Wetland WRE-5 is part of a much larger riparian wetland complex that extends upstream and downstream of the study area. In the study area, Wetland WRE-5 is southwest (downstream) of an abandoned (railbanked) section of BNSF railroad, which separates Wetland WRE-5 from Wetland WRE-6 to the northeast (upstream) (see Figure 3-8D).

The wetland boundary to the north, east, and west is defined by the presence of fill prisms associated with SR 520, adjacent developments, and the railroad grade. The wetland continues downstream to the confluence with the Sammamish River.

Wetland hydrology is supported by seasonal high flows associated with Bear Creek, high groundwater table, and surface water runoff. Wetland hydrology indicators observed included inundation, a high water table, saturation, sediment deposits, drift deposits, water-stained leaves, and drainage patterns.

Wetland WRE-5 contains forested, scrub-shrub, and emergent plant communities. Vegetation within Wetland WRE-5 includes red alder, Oregon ash, black cottonwood, Sitka spruce, willows, snowberry, Nootka rose, red osier dogwood, Himalayan blackberry, salmonberry, slough sedge, stinging nettles, Kentucky bluegrass, creeping buttercup, and reed canarygrass (Figure 3-16).

Soil at SP-40 is representative of soils encountered in other portions of the wetland. The soil was examined to a depth of 20 inches and consists of three layers. The top layer is a 4-inch very dark gray (10YR 3/1) loam. The middle layer is a very dark grayish brown (10YR 3/2) loamy sand with dark yellowish brown (10YR 4/4) redoximorphic features. The lower layer is a dark gray (10YR 4/1) fine sand with yellowish brown (10YR 5/6) redoximorphic features. Soils meet the *depleted below dark surface* and *sandy redox* hydric soil indicators. Soils in the wetland are mapped as Indianola loamy sand by the NRCS (USDA 2017).

The vegetated buffer surrounding Wetland WRE-5 is narrow because it is limited by adjacent roadways and development. The remaining buffer is dominated by Himalayan blackberry, black cottonwood, red elderberry, and snowberry.

Wetland WRE-5 is classified as palustrine forested, scrub-shrub, and emergent under the USFWS system and riverine under the HGM system. Wetland WRE-5 was rated according to the 2014 Washington State Wetland Rating System for Western Washington—Updated (Hruby 2014), as specified in RZC 21.64.030(A). The wetland scored 24 points using the Ecology 2014 system, thereby qualifying as a Category I wetland (see Attachment C.2 and Table C.2-1). A preliminary review of the forested area indicates it also qualifies as a Category I wetland, based on the presence of mature forested components in the wetland. RZC requires a wetland buffer width of 150 feet for Category I wetlands with a habitat score of 5 to 7 points and adjacent high-impact land uses.

Functions provided by the wetland are high overall, as assessed by the Ecology Rating System, with 24 total points. With a score of 9 points, Wetland WRE-5 has very high water quality functional abilities. The proximity of the wetland to urban development increases the site's landscape potential for water quality improvements. At a site level, Wetland WRE-5 has depressions and vegetation covering most of

the area to slow and retain surface water, allowing pollutants to settle out. Wetland WRE-5 scored 8 points (high) for hydrologic functions. The floodplain width and the large amount of trees and shrubs in the area contribute to slowing the velocity of floodwaters. Wetland WRE-5 has been identified as an important flood storage area in the City of Redmond's Final Comprehensive Flood Hazard Management Plan. Habitat functions of the site scored a moderately high 7 points. Interspersion of habitats is high with four vegetation classes (including a diversely stratified forested class) and open water. Various habitat features are present such as large downed logs, snags, undercut banks, stable steep slopes for denning, and thin-stemmed persistent plants for amphibian egg-laying. Bear Creek provides habitat for multiple salmon species including federally listed Chinook salmon. Wetland WRE-5 helps support these fish populations by providing refuge and rearing areas.

Figure 3-16. Wetland WRE-5 and a side channel of Bear Creek shown downstream of the railroad fill prism and east of the main Bear Creek channel

3.2.2.9 Wetland WRE-6

Size: 0.43 acre
USFWS Classification: Palustrine Forested and Scrub-Shrub
HGM Classification: Riverine
Local Jurisdiction: City of Redmond
Local Rating: Category I
Sample Plots: SP-49 (UPL), SP-50 (WET), SP-50b (UPL), SP-51 (WET), SP-66 (WET) through SP-71 (UPL)

Wetland WRE-6 is located in a floodplain on the right and left banks of Bear Creek in the city of Redmond. As mapped by the City of Redmond (City of Redmond 2017), Wetland WRE-6 is part of a much larger riparian wetland complex that extends upstream and downstream of the study area. In the study area, Wetland WRE-6 is positioned northeast of an abandoned (railbanked) section of BNSF railroad, which separates Wetland WRE-6 from Wetland WRE-5 to the southwest (downstream) (see Figure 3-8D). Wetland WRE-6 is downstream of the SR 202 bridge.

The wetland boundary is defined by the presence of fill prisms associated with SR 520, SR 202, adjacent developments, and the railroad grade. In addition, the wetland boundary to the north (both sides of Bear Creek) is based on a lack of hydric soils and wetland hydrology. Bear Creek is incised in this area and is isolated from its floodplain. The wetland includes a backwater channel on the east bank and a flood bench on the west bank, both of which are located immediately upstream of the railroad bridge.

Wetland hydrology is supported by seasonal high flows associated with Bear Creek, a high groundwater table, and surface water runoff. Wetland hydrology indicators observed included a high water table, inundation, saturation, water marks, sediment deposits, drift deposits, water-stained leaves, and drainage patterns.

Wetland WRE-6 contains a forested and scrub-shrub plant community. Vegetation within Wetland WRE-6 includes black cottonwood, Himalayan blackberry, red osier dogwood, salmonberry, large-leaf avens, reed canarygrass, creeping buttercup, and slough sedge (Figure 3-17).

Soil at SP-52 is representative of soils encountered in other portions of the wetland. Soils were examined to a depth of 20 inches and consist of three layers. The top layer is a 5-inch very dark brown (10YR 2/2) loam. The middle layer is a very dark brown (7.5YR 3/2) loam with dark brown (7.5YR 3/1) and brown (10YR 5/3) redoximorphic features. The lower layer is a very dark grayish brown (10YR 3/2) gravelly loam with strong brown (7.5YR 4/6) redoximorphic features. Soils meet the *redox dark surface* hydric soil indicator. Soils in the wetland are mapped as Indianola loamy sand by the NRCS (USDA 2017).

The vegetated buffer surrounding Wetland WRE-6 is narrow because it is limited by adjacent roadways and development. The remaining buffer is dominated by Himalayan blackberry, black cottonwood, and snowberry.

Wetland WRE-6 is classified as palustrine forested and scrub-shrub under the USFWS system and riverine under the HGM system. Wetland WRE-6 was rated according to the 2014 Washington State Wetland Rating System for Western Washington—Updated (Hruby 2014), as specified in RZC 21.64.030(A). The wetland scored 24 points using the Ecology 2014 system, thereby qualifying as a Category I wetland (see Attachment C.2 and Table C.2-1). The RZC requires a standard wetland buffer width of 150 feet for Category I wetlands with a habitat score of 5 to 7 points and adjacent high-impact land uses.

Functions provided by the wetland are high overall, as assessed by Ecology's Rating System, with 24 total points. Water quality functions of the site scored a high 9 points. Surface depressions cover approximately half of the area and trees and shrubs cover much of the wetland. Bear Creek flows through Wetland WRE-6 and is on Ecology's 303(d) list. A Total Maximum Daily Load (TMDL) plan for the Bear-Evans watershed has been established to address warm temperatures, low dissolved oxygen, and high bacteria levels. Wetland WRE-6 scored a high 8 points for hydrologic functions. Its urban location increases the landscape potential for flood control. At a site level, Wetland WRE-6 has a high proportion of trees and shrubs to slow flood velocities but a low stream-to-wetland ratio for overbank storage potential. The habitat function score for Wetland WRE-6 is 7 points (moderate). Wetland WRE-6 has a high interspersion of habitats with 2 vegetation classes and 3 water regimes present. Many habitat features exist within the site for wildlife. Wetland WRE-6 is recognized by WDFW as a priority habitat for multiple salmon species.

Figure 3-17. Wetland WRE-6 photographed upstream of the railroad crossing over Bear Creek

3.2.2.10 Wetland WRE-7

Size: Over 5 acres (large wetland extends off site)
USFWS Classification: Palustrine Forested, Scrub-Shrub, and Emergent
HGM Classification: Riverine
Local Jurisdiction: City of Redmond
Local Rating: Category I
Sample Plots: SP-74 (WET) to SP-78 (WET)

Wetland WRE-7 is located in a floodplain on both banks of Bear Creek in the city of Redmond. As mapped by the City of Redmond (City of Redmond 2017), Wetland WRE-7 is part of a much larger riparian wetland complex that extends upstream and downstream of the study area. Within the study area, Wetland WRE-7 is positioned northeast (upstream) of the SR 202 bridge, which separates Wetland WRE-7 from Wetland WRE-6 to the southwest (downstream) (see Figure 3-8D).

Only a portion of this wetland was delineated (within WSDOT right-of-way from east bank of Bear Creek, east to NE 76th Street), based on the expected project extent. The wetland boundary is defined to the south by the extent of fill prisms associated with SR 202, to the west by the scoured Bear Creek channel, and to the east by a shift in soils and hydrology to upland conditions that coincide with a gradual gain in elevation approaching NE 76th Street.

Wetland hydrology is supported by seasonal high flows associated with Bear Creek, a high groundwater table, and surface water runoff. Wetland hydrology indicators observed included a high water table, inundation, saturation, water marks, and sediment deposits.

Wetland WRE-7 contains forested, scrub-shrub, and emergent plant communities. Vegetation within Wetland WRE-7 includes black cottonwood, Pacific willow, Himalayan blackberry, and reed canarygrass (Figure 3-18).

Soil at SP-74 is representative of other soils observed in the wetland. Soils were examined to a depth of 16 inches and consist of three layers. The top layer is a 4-inch very dark grayish brown (10YR 3/2) silt loam. The middle layer is a dark grayish brown (10YR 4/2) sandy loam with strong brown (7.5YR 4/6) redoximorphic features. The lower layer (12 inches and deeper) is a gray (10YR 5/1) sand with strong brown (7.5YR 4/6) and yellowish brown (10YR 5/8) redoximorphic features. Soils meet the *depleted matrix* hydric soil indicator. Soils in the wetland are mapped as Indianola loamy sand by the NRCS (USDA 2017).

The vegetated portion of the buffer surrounding Wetland WRE-7 is forested, scrub-shrub, and herbaceous with black cottonwood, Himalayan blackberry, and reed canarygrass as typical dominant species.

Wetland WRE-7 is classified as palustrine forested, scrub-shrub, and emergent under the USFWS system and riverine under the HGM system. Wetland WRE-7 was rated according to the 2014 Washington State Wetland Rating System for Western Washington—Updated (Hruby 2014), as specified in RZC 21.64.030(A). The wetland scored 23 points using the Ecology 2014 method, thereby qualifying as a Category I wetland (see Attachment C.2 and Table C.2-1). The RZC requires a standard wetland buffer width of 150 feet for Category I wetlands with a habitat score of 5 to 7 points and adjacent high-impact land uses.

Functions provided by the wetland are moderately high overall, as assessed by Ecology's Rating System, with 23 total points. Wetland WRE-7 scored 8 points (high) for water quality functions. The wetland is intersected by Bear Creek, which is on Ecology's 303(d) list and has a TMDL plan. Surface depressions important for trapping sediments are present within the site but cover less than half of the wetland. A

high proportion of trees and shrubs is present and assist in water treatment. The hydrologic functional score for Wetland WRE-7 is moderately high with 8 points. Wetland WRE-7 has a high landscape potential for hydrologic function due to its urban location. Site potential is limited with a low stream-to-wetland ratio for overbank storage. The habitat functional score for Wetland WRE-7 is 7 points (moderately high). Multiple vegetation and water regimes support the high interspersion of habitats at the site. Various habitat features are present such as large downed logs, snags, undercut banks, stable steep slopes for denning, and thin-stemmed persistent plants for amphibian egg-laying. WDFW identifies the site as priority habitat for multiple salmon species.

Figure 3-18. Wetland WRE-7 photographed north of Redmond Way

3.2.2.11 Wetland WRE-8

Size: 1.01 acre
USFWS Classification: Palustrine Forested, Scrub-Shrub, and Emergent
HGM Classification: Depressional
Local Jurisdiction: City of Redmond
Local Rating: Category II
Sample Plots: SP-54 (UPL), SP-55 (WET), SP-56 (WET), SP-57 (UPL), SP-58 (WET), SP-59 (UPL), SP-60 (WET), SP-61 (UPL), SP-62 (WET), SP-63 (UPL), SP-64 (WET), SP-65 (UPL)

Wetland WRE-8 is located in a depression on both sides of the paved Redmond Central Connector Trail, south of 170th Avenue NE, in the city of Redmond (see Figure 3-8D). A trail bridge near 170th Avenue NE connects the northern and southern portions of this wetland. The wetland boundary is defined by the extents of fill material placed for adjacent commercial developments and the old railroad grade (currently in use as the paved Redmond Central Connector Trail).

Wetland hydrology is supported by a high groundwater table and runoff inputs from the surrounding developed areas. A 12-inch culvert was observed discharging into the wetland at its southern extent, with potential stormwater input from the nearby paved parking area, trail, and Redmond Way. The outlet is a highly constricted 18-inch culvert that extends beneath 170th Avenue NE. Inundation, high water table, and saturation were observed.

Wetland WRE-8 contains forested, scrub-shrub, and emergent plant communities. Vegetation within the wetland includes paper birch, Oregon ash, one-seed hawthorn, Himalayan blackberry, and reed canarygrass (Figure 3-19).

Soil was examined to a depth of 18 inches and consists of four layers. The top layer is a 2.5-inch black (10YR 2/1) silty clay loam. The middle layer is very dark gray (10YR 3/1) silty clay loam with dark grayish brown (10YR 4/2) redoximorphic features from 2.5 to 5 inches. The other middle layer is a gray (2.5Y 5/1) silty clay loam with yellowish brown (10YR 5/8) and dark gray (10YR 4/1) redoximorphic features. The lower layer is a very dark gray (10YR 3/1) clay loam with dark yellow brown (10YR 3/6) and dark gray (10YR 4/1) redoximorphic features. Soils meet the *redox dark surface* and *depleted matrix* hydric soil indicators. Soils in the wetland are mapped as Earlmont silt loam and Indianola loamy sand by the NRCS (USDA 2017).

The buffer surrounding the western, northern, and most of the southern side of Wetland WRE-8 is mostly impervious surface from adjacent businesses, parking lots, and roadways. However, there is a narrow band of herbaceous growth and forested area, including black cottonwood, Douglas-fir, Himalayan blackberry, and reed canarygrass between the wetland and developed areas. The southeastern portion of the vegetated buffer is wider (over 100 feet) and is primarily forested with big-leaf maple, black cottonwood, and western hemlock. This portion of the buffer includes the Bear Creek Trail. The understory in this portion of the buffer includes vine maple, red elderberry, and Himalayan blackberry.

Wetland WRE-8 is classified as palustrine forested, scrub-shrub, and emergent under the USFWS system and depressional under the HGM system. Wetland WRE-8 scored 21 points using Ecology's 2014 rating form and therefore is rated as Category II according to the City of Redmond (RZC 21.64.030) and Ecology (see Attachment C.2 and Table C.2-1). The City of Redmond requires a 150-foot buffer for Category II wetlands that have a habitat rating of 5 to 7 points and high-impact land uses (RZC 21.64.030 (B)).

Functions provided by the wetland are moderate overall, as assessed by Ecology's Rating System, with 21 total points. Wetland WRE-8 has a moderate water quality functional score of 7 points. The site receives stormwater discharges from paved trails and roads nearby. A highly constricted outlet contributes to ponding of more than a quarter of the site. Persistent ungrazed vegetation assists in sediment trapping and comprises over 95 percent of Wetland WRE-8. High ponding marks of 0.5 to 2 feet and potential to reduce flooding downstream contribute to the high hydrologic functions score of 8 for the site. The total habitat score for Wetland WRE-8 is a moderate 6 points. Wetland WRE-8 has moderate habitat interspersion of four vegetation classes (including a diversely stratified forested community). Habitat features present within the wetland include large woody debris and thin-stemmed persistent plants for amphibian breeding, as well as nearby WDFW priority habitats.

Figure 3-19. Wetland WRE-8 photographed adjacent to the Redmond Central Connector Trail

3.2.2.12 Wetland WRE-9

Size: 0.01 acre
USFWS Classification: Palustrine Forested
HGM Classification: Depressional
Local Jurisdiction: City of Redmond
Local Rating: Category III
Sample Plots: SP-102 (UPL), SP-103 (WET), SP-104 (UPL)

Wetland WRE-9 is located in a small depression to the east of the Bear Creek Trail and to the west of the Bear Creek in the city of Redmond (Figure 3-8D). The wetland boundary is defined by a gradual change in soil and vegetation and an abrupt topographical change that coincides with banks of the depression. The area above the depression lacks hydric soils and wetland hydrology.

Wetland hydrology is supported by a high groundwater table, which fluctuates depending on the flow of Bear Creek. There is no outlet or inlet to this wetland area, where a sparsely vegetated concave surface and water-stained leaves were observed. In addition, the vegetation passed the facultative-neutral test.

Wetland WRE-9 contains a forested plant community. Vegetation within the wetland includes black cottonwood, Oregon ash, and a trace amount of Himalayan blackberry.

Soil at SP-103 is representative of other soils observed in the wetland. Soil was examined to a depth of 18 inches and consists of two layers. The top layer is an 8-inch-thick, very dark brown (10YR 2/2) loam. The bottom 10-inch-thick layer is dark grayish brown (2.5YR 4/2) loam with strong brown (7.5YR 4/6) redoximorphic features. Soils meet the *depleted below dark surface* and *depleted matrix* hydric soil indicators. Soils in the wetland are mapped as Indianola loamy sand by the NRCS (USDA 2017).

The buffer surrounding the Wetland WRE-9 includes a forested upland area to the north and south, the Bear Creek floodplain to the east, and Bear Creek Trail to the west. The upland area includes black cottonwood, Douglas-fir, Oregon ash, Himalayan blackberry, snowberry, osoberry, stickywilly, and Robert geranium. See Wetland WRE-5 and Bear Creek sections for a description of the floodplain buffer to the east.

Wetland WRE-9 is classified as palustrine forested under the USFWS system and depressional under the HGM system. Wetland WRE-9 scored 17 points using Ecology's 2014 rating form and therefore is rated as Category III according to the City of Redmond (RZC 21.64.030) and Ecology (see Attachment C.3). Overall, functions provided by Wetland WRE-9 are moderately low, as assessed by Ecology's Rating System.

Water quality functions for Wetland WRE-9 scored 6 points (moderately low). Since there is no outlet, there is the potential to pond water. In addition, persistent ungrazed vegetation comprises over 50 percent of the site and improves water quality through sediment trapping and shading.

The hydrologic functions score of Wetland WRE-9 is 5 points (moderately low). The lack of outlet and ponding potential allow for greater surface water storage; however, marks of ponding at the site measured to be less than 0.5 feet high. Because Wetland WRE-9 has no outlet, surface water is detained, thus reducing downstream flooding. However, downstream flooding is not a significant issue; therefore, the wetland has limited opportunity to provide this function.

The habitat score of Wetland WRE-9 is 6 points (moderately low). Despite the multiple vegetation classes with a moderate species diversity, the small size of the wetland resulted in a low interspersion of habitats at the site. Special habitat features include large woody debris, snags, and the lack of invasive species. The surrounding accessible habitat and undisturbed habitat is limited by Bear Creek Trail and the surround urban development.

Figure 3-20. Wetland WRE-9 photographed to the east of the Bear Creek Trail

3.2.3 Streams

Three streams were identified in the study area: Sammamish River, an unnamed tributary to the Sammamish River, and Bear Creek. The attributes of these streams are summarized in Table 3-4, discussed in the subsections that follow, and mapped in Figures 3-8A,3-8B, and 3.8D.

Table 3-4. Stream Conditions in the Study Area

Stream Name	Stream Index No. [a]	State Interim Water Type[b]	Local Jurisdiction	Local Jurisdiction Stream Classification	Local Jurisdiction Buffer Width (feet)
Sammamish River	08.0057	Type 1	Redmond	Class I	150 [c]
Sammamish River	08.0057	Type 1	King County	Type S	115 [d]
Unnamed tributary to the Sammamish River (LLID 1221262476704)	N/A	Type 5	Redmond	Class IV	25
Bear Creek	08.0105	Type 1	Redmond	Class I	150
Unnamed tributary to Bear Creek (LLID 1221079476713)	N/A	Type 2	Redmond	Class II	100 (plus 50-foot outer buffer)

[a] WRIA identification numbers according to Williams et al. (1975)

[b] WAC 222-16-031

[c] Redmond Zoning Code (RZC) Table 21.64.020 (effective 4/16/2011); King County Code (KCC) 21A.24.358 (updated May 12, 2017)

[d] The King County buffer width for the Sammamish River is based on (a) the location of the study area within the designated Urban Growth Area, and (b) the designation of the condition of the basin as "low," according to the map in Appendix A of the King County Critical Areas Ordinance.

3.2.3.1 Sammamish River

WRIA Index No.: 08.0057
City of Redmond Classification: Class I
Buffer: 150 feet
King County Classification: Type S
Buffer: 115 feet
Washington State Interim Water Type: 1

The Sammamish River is 13.8 miles long and extends from the outlet of Lake Sammamish in the city of Redmond to the inlet on Lake Washington in the city of Kenmore. The river is an inventoried Shoreline of the State. The basin drains approximately 240 square miles.

Within the Redmond city limits, the Sammamish River and all lands extending 200 feet landward from the river's OHWM are subject to the regulatory requirements of the City's Shoreline Management Program (SMP).

The shoreline zone within the boundaries of Marymoor Park falls within the shoreline management jurisdiction of King County. According to KCC 21A.25.050, the King County shoreline jurisdiction consists of the Sammamish River and all lands extending 200 feet landward from the river's OHWM, as well as (1) the 100-year floodplain and contiguous floodplain areas 200 feet landward from the 100-year floodplain, and (2) all wetlands associated with the Sammamish River.

Within the study area, the Sammamish River is approximately 60 feet wide. The ordinary high water elevation is between 30.9 and 31.1 feet in elevation (NAVD 88 datum). This elevation coincides with a flow of approximately 1,000 cfs at the Marymoor weir gauge (see discussion in Section 3.1.4.2).

King County maintains a gauging station in the Sammamish River in Marymoor Park, approximately 0.8 mile upstream of the study area. Based on data collected from July 2001 through March 2017, the annual average discharge at that site is approximately 213 cfs (King County 2017c). Monthly average discharges during that period ranged from 19 cfs (August 2015) to 798 cfs (January 2006). Averaged over the full data period, monthly average discharges ranged from 34 cfs (in August 2017) to 407 cfs (in January 2017) (King County 2017c).

Several culverted discharges to the Sammamish River were observed during site surveys. On the west (left) bank, a 24-inch culvert discharges to the river directly under SR 520, which was assumed to be stormwater from the highway. Another larger but partially obscured culvert discharges on the same bank, immediately downstream of the SR 520 bridge. It appears to discharge water from stormwater ponds located immediately to the west, which are partially fed by piped but natural stream flow and road runoff. On the east (right) bank, an 18-inch culvert occasionally discharges water from a floodplain mitigation site and depression excavated immediately east of the river. Another 18-inch culvert discharges water collected in a stormwater swale near SR 520.

Riparian Vegetation

Riparian vegetation in the reach of the Sammamish River within the study area (south of SR 520) is severely degraded, consisting mostly of non-native shrubs and herbs—predominantly Himalayan blackberry and reed canarygrass (U.S. Army Corps of Engineers and King County 2002). Most riparian trees in the study area are young alder (Sound Transit 2011).

The functional riparian buffer west of the river is approximately 30 feet wide, consisting of a single row of deciduous trees (red alders) and various native and non-native shrubs, with relatively dense cover. Beyond that distance, the buffer zone consists of the 12-foot-wide paved Sammamish River Trail, a 30- to 50-foot-wide vegetated area with ornamental trees, native and non-native shrubs, and mowed grasses, and the 70-foot-wide roadway of West Lake Sammamish Parkway NE.

Riparian vegetation on the east side of the river extends a greater distance from the river bank. Immediately south of the West Lake Sammamish Parkway on-ramp to SR 520, a 50-foot strip was cleared for the highway widening project in 2009 but was subsequently replanted. The innermost 50 feet of the riparian zone in that strip is densely covered with native and non-native shrubs. East of that area, the previously cleared strip has been planted with young coniferous trees (western red cedar). South of the previously cleared strip, the innermost portion of the riparian buffer is densely vegetated with a 40- to 60-foot-wide band of deciduous trees (red alder and cottonwood) and shrubs. After being interrupted by a 10-foot-wide gap for an unpaved access route, the tree canopy extends east for approximately 60 more feet. Beyond that, the riparian buffer is dominated by low-growing, primarily non-native grasses and shrubs.

Downstream (north) of the project site, the river is spanned by SR 520. Under the highway, the sparsely vegetated riparian area includes Himalayan blackberry, snowberry, and non-natives grasses. The ground surface is covered with a mixture of wood chip mulch, bare soil, and exposed riprap.

Within the riparian zone, the dominant tree species are red alder, Douglas-fir, Oregon ash, big-leaf maple, and black cottonwood. Some non-native deciduous trees such as Norway maple also occur in the riparian zone. Many of the trees in this area are wrapped with fencing to protect them from beavers. Other trees have been damaged or felled by beaver activity. The dominant shrub species are Himalayan blackberry, Scouler's willow, Sitka willow, red osier dogwood, and Pacific nine-bark. Tree canopy cover is

over 100 percent (complete canopy, multiple layers in some areas) throughout the corridor and extends over the stream channel. The banks are densely rooted with good soil cohesion. Extensive areas of riprap have been placed along the river banks to limit erosion. Ground cover is dominated by shrubs and occupies approximately 60 percent of the riparian area. Herbaceous cover is generally sparse and dominated by non-native grasses. There are no large snags or downed logs in the study area. Small, short pieces of downed wood were observed on some site visits but appear to be mobile. The steep, hardened river banks limit the opportunity to rack woody debris or develop persistent jams.

3.2.3.2 Unnamed Tributary to the Sammamish River (LLID 1221262476704)

WRIA Index No.: None
City of Redmond Classification: Class IV
Buffer: 25feet
Washington State Interim Water Type: 5

The study area includes an unnamed tributary to the Sammamish River, identified by the Washington Department of Natural Resources (WDNR) as LLID 1221262476704. This watercourse runs parallel to SR 520 southwest of the Sammamish River crossing, discharging to the Sammamish River downstream of SR 520. Although Williams et al. (1975), WDFW (2017a, 2017b), and the City of Redmond (Map 64.3, Streams Classification, effective March 20, 2016) do not identify a stream in that area, the watercourse appears on maps developed by the WDNR Forest Practices Application Review System (2017) (based on the WDNR Fish Habitat Water Typing Model), King County (2017a), NWI, and Washington Trout (2005). Historical aerial imagery and topographic contours (see Figures 3-1 and 3-2) suggest that a surface-flowing watercourse with multiple branches once flowed north from the location of NE 40th Street, and now has largely been piped through this reach. One branch of this system is now called Clise Creek by the City of Redmond and discharges to the Sammamish River upstream (south) of the study area. Field observations and mapping review suggest that the stream currently discharges from a pipe to a stormwater pond north of SR 520, within the cloverleaf intersection with West Lake Sammamish Parkway NE. Flow is then piped to a confluence with the Sammamish River immediately downstream of the SR 520 bridge crossing.

During field reviews in May 2017, a stream was found flowing in an 8-foot-wide channel east of SR 520, immediately north of the NE 60th Street overpass, which was presumed to be a branch or segment of LLID 1221262476704. The water flowed at the surface into the WSDOT right-of-way from private property, then flowed for approximately 20 feet through a forested area in the right-of-way before entering a culvert with an unknown discharge location. Washington Trout (2005) did not conduct field surveys of this watercourse and classified it as Type 9, untyped/unknown mapped stream. Reaches upstream of the NE 60th Street overpass were also not surveyed by Washington Trout, but classified as Type 4 (perennially flowing, non-fish habitat) and Type 5 (seasonally flowing, non-fish habitat) (Washington Trout 2005).

This watercourse is not mapped as a stream by WDFW; therefore, no assessments of fish passage have been conducted. The likelihood of fish migrating between the river and the surface-flowing segment is extremely low for several reasons. First, to enter the watercourse, fish would have to pass through the stormwater pond that empties to the river via a pipe. Upstream of the stormwater pond, the watercourse is contained within pipes for several thousand feet, flowing at the surface for only the short segment described above. No other surface-flowing segments are readily apparent farther upstream.

Many streams in the city of Redmond arise along the crest of the Sammamish River valley wall, gather flow from springs and seeps as they flow down the valley walls, and then infiltrate into the ground when reaching the valley floor (Washington Trout 2005). It is possible that this unnamed tributary to the Sammamish River is the remnant of a stream that historically followed that pattern. Based on the intermittent flow and no

salmonid fish use mapped by WDFW (2018) paired with the Washington Trout (2005) findings, the City of Redmond defines such streams as Class IV streams, according to RZC 21.64.020.A.2. Based on the channel width and gradient, the watercourse would meet the criteria for a Type Ns Water according to WAC 222-16-030(4).. For the purposes of this assessment, it is assumed to be a Class IV stream with a 25-foot buffer.

Within the survey area, the unnamed tributary to the Sammamish River is approximately 8 feet wide. The ordinary high water elevation will be determined following a pending professional land survey.

3.2.3.3 Bear Creek

WRIA Index No.: 08.0105
City of Redmond Classification: Class I
Buffer: 150 feet
Washington State Interim Water Type: 1

Despite the effects of expanding urban development and an associated shift from forest to impervious surfaces and landscaped areas, Bear Creek continues to be a major producer of salmon in WRIA 8 (Lawson et al. 2012). The Bear Creek drainage is known to support Chinook salmon, coho salmon, sockeye salmon, kokanee salmon, steelhead, and cutthroat trout. The Washington State Salmon Recovery Fund has sponsored many millions of dollars of habitat restoration in the Bear Creek watershed, including in-stream work, riparian restoration, and the reconfiguration of the confluence of Evans Creek with Bear Creek. In recognition of its role in upstream staging and downstream migration and rearing, and as a refuge for salmonids escaping the warmer waters of the Sammamish River, King County (1995) recognized the Lower Bear Creek sub-basin as a Locally Significant Resource Area.

The Bear Creek corridor in the study area is surrounded by developed parcels. To the west and northwest is the commercial core of downtown Redmond, consisting almost entirely of heavily developed impervious surfaces. NE Redmond Way (SR 202) crosses Bear Creek approximately 250 feet north of the proposed alignment. SR 520 runs parallel to the stream south and east of the proposed crossing. Heavily developed commercial areas lie across SR 520 to the east and southeast. A corridor of relatively undeveloped land provides some riparian habitat along Bear Creek within the study area, and in adjoining reaches upstream and downstream. An old railroad bridge spans Bear Creek at the site of the proposed alignment. A WDFW fish-monitoring barge is moored to this bridge. A gravel road, built on railroad bed fill, accesses the southeast side of the bridge from the westbound on-ramp to SR 520. An informal walking route occurs on the railroad fill northwest of the railroad bridge.

Reaches of Bear Creek within and near the study area have been the subject of extensive habitat restoration work. In the late 1990s, WSDOT and the City of Redmond collaborated on habitat enhancement efforts in Bear Creek immediately adjacent to the location where the proposed alignment would cross the stream (railroad bridge site). These efforts included riparian plantings and wetland restoration.

More recently, a major restoration effort was implemented downstream of the study area, in part as mitigation for the SR 520, I-5 to Medina Bridge Replacement and HOV project. The restoration work was designed to establish a compositionally and structurally complex ecosystem with attributes important for supporting fish and wildlife, with an emphasis on anadromous fish such as Chinook, coho, and sockeye salmon. The design included channel reconfiguration (to increase meandering), large woody debris emplacement, bank stabilization, stream gravel, native riparian plantings, and wetland creation. Adjacent uplands were excavated to create more floodplain storage and habitat associated with the new channel. Riparian and floodplain areas were planted to enhance in-stream and riparian functions such as cover, shading, large woody debris recruitment, bank stabilization, terrestrial insect food production, and leaf litter organic debris in support of in-stream food sources. Approximately 3,000 pieces of large

woody debris were added to the stream channel within the bankfull width (Lawson et al. 2012). The recently restored reach is approximately 250 feet north of the proposed alignment, on the opposite side of SR 520.

The regulatory requirements of the City of Redmond's SMP apply to Bear Creek and all lands extending 200 feet landward from the OHWM of the stream, as well as portions of the 100-year floodplain and any associated wetlands that extend beyond the 200-foot buffer. The City of Redmond has designated a 150-foot-wide Urban Conservancy corridor adjacent to Bear Creek; the remaining 50 feet of the Shoreline Management Zone is designated as a High Intensity/Multi-use environment. According to SMP Policy SL-5, development should be encouraged in previously disturbed, under-utilized High Intensity/Multi-use shoreline environments, such as the BNSF corridor in the study area.

The only observed culvert discharging to Bear Creek in the study area conveys stormwater from detention ponds under the SR 520 bridge. The culvert is approximately 30 inches in diameter.

Within the survey area, Bear Creek is approximately 20 feet wide. The ordinary high water elevation is between 40.5 and 41.5 feet in elevation (NAVD 88 datum). This elevation coincides with a flow of approximately 650 cfs at the Bear Creek gauge (see discussion in Section 3.1.4.2).

Riparian Vegetation

The Bear Creek riparian area in the vicinity of the proposed crossing is vegetated with a mixture of native and non-native species. Tree cover is extensive and dominated by native species including red alder, Oregon ash, black cottonwood, and western red cedar, with scattered Douglas-fir at the highest elevations. Non-native deciduous trees also occur in the riparian area, along adjacent roads, trails, and other developments. Forested areas have understory vegetation composed of a mixture of shrubs and herbaceous species. Native shrubs include salmonberry, red osier dogwood, and willow while the invasive shrubs include Himalayan and cut-leaf blackberry. The fairly sparse herbaceous stratum contains native piggy-back plant and slough sedge, as well as invasive creeping buttercup and reed canarygrass. Scrub-shrub areas are dominated by a variety of shrubs described above. Emergent areas are dominated by dense stands of reed canarygrass. Beaver activity is apparent from numerous downed trees, cut shrubs, and dams. Habitat values of the riparian community are high based on the complex vegetation and stream structure, presence of snags and large woody debris, and the extent of the restored corridor and its connectivity to habitats upstream and downstream.

3.2.3.4 Unnamed Tributary to Bear Creek

WRIA Index No.: None
City of Redmond Classification: Class II
Buffer: 100 feet + 50-foot outer buffer
Washington State Water Type: F

The study area includes an unnamed tributary to Bear Creek identified by WDNR as LLID 1221079476713. Within the study area, this waterbody runs parallel to where the off-ramp for SR 520 continues into NE 76th Street. The unnamed tributary to Bear Creek originates off site in the northeast and resurfaces on site after discharging out of three various sized culverts under the Univar USA parking lot (parcel number 0623100020). The stream then flows approximately 750 feet through an emergent wetland (WRE-7) before being conveyed through two large culverts under an old levee. The water then discharges to Bear Creek approximately 75 feet north of the Redmond Way/SR 202 bridge. The unnamed tributary to Bear Creek is mapped by King County(2017a), WDFW (2018), and the WDNR

(2018); however, no maps match the field observations and delineation. The City of Redmond (Map 64.3, Streams Classification, effective March 20, 2016) does not identify a stream in this area.

Field visits occurred in April 2018 after a period of heavy rains. At this time, the unnamed tributary to Bear Creek had an average channel width of approximately 15 feet. During the field visit, juvenile fish bearing par marks (unknown if trout or salmon) were observed where it resurfaces south of parcel number 0623100020. WDNR maps the unnamed tributary to Bear Creek as a Type 2 perennial fish-bearing stream. WDFW's Salmonscape tool maps the stream as intermittent/ephemeral with the modeled presence of Chinook, coho, steelhead, and sockeye. Based on the potential presence of fish, the stream is classified by Redmond as a Class II according to RZC 21.64.020.A.2.

Riparian vegetation

The majority of the unnamed tributary to Bear Creek flows through an emergent wetland composed of reed canarygrass, bull thistle, Kentucky blue grass, meadow foxtail, and bentgrass. Near the confluence with Bear Creek, it flows adjacent to a scrub-shrub plant community. This scrub-shrub community consists primarily of willow and Himalayan blackberry.

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