

Spokane River Shoreline Habitat Report

Division Street Bridge to the INB Performing Arts Center

prepared for the

Spokane Public Facilities District

November 2, 2012



Biology
Soil &
Water, Inc.

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PLANNING SERVICES

Spokane River Shoreline Habitat Report

Division Street Bridge to the INB Performing Arts Center
prepared for the
Spokane Public Facilities District

site located in
Section 18, T25N, R43E
City of Spokane, Spokane County, WA

Retained by

Spokane Public Facilities District
Contact Person: Kevin J. Twohig, CFE
720 W. Mallon
Spokane, WA 99201
phone (509) 279-7000

Investigated by

Biology Soil & Water, Inc.
Contact Person: Larry Dawes, Principal Biologist
3102 N. Girard Road
Spokane Valley, WA 99212-1529
Phone 509-327-2684
Email: bswinc@icehouse.net

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1.0: Introduction

The Public Facilities District (PFD) proposes expansion of the Convention Center into the existing Shenanigan's site, re-landscaping the Shenanigan's site, and enhancing the riverbank from the edge of the Centennial trail to the edge of the Spokane River. Biology Soil and Water, Inc. (BSW) was retained by the Spokane Public Facilities District to complete a plant survey and habitat evaluation on the south bank of the Spokane River between the Division Street Bridge and the east end of the INB Performing Arts Center. This report includes a habitat evaluation, an analysis of existing functions and values, and recommendations for restoring the riverbank.

Soils and vegetation between the riverbank and the proposed development footprint have been greatly disturbed by historical land uses. In the early 1900s the natural flora and fauna were totally eliminated when the site was cleared, grubbed, and graded during the construction of railroad yards. The railroad yard was reclaimed for the World's Fair in 1974 and the site was subsequently landscaped with a mixture of native and non-native plants when it was converted to a park.

As the steward of the Spokane River corridor, the community has a responsibility to continue a dialog about the functions and values of the river corridor. As a community we struggle to restore and preserve the natural qualities and scenic beauty in the corridor while promoting human activity that diminishes the habitat value for other species. The Spokane River is a valuable wildlife corridor that provides transitional habitat for opportunistic species traveling through the area seasonally. However, wildlife habitat in the Spokane River corridor is highly fragmented. Riparian dependent bird and mammal habitat diversity is very limited in the downtown area due to the narrow width of the vegetated zone and the high degree of human disturbance. In the project area, the term habitat applies mainly to birds and humans.

The proposed expansion of the Convention Center will occur in an existing disturbed footprint where the habitat value is low. The Convention Center will be expanded into the Shenanigan's parking lot, the Shenanigan's restaurant footprint, and into an area of landscaped park on the west side of Shenanigan's. The new Convention Center addition will be set back further from the river than the existing Shenanigan's building so there will be a net gain in undeveloped shoreline. This project provides an opportunity to expand the vegetated footprint slightly into a currently developed footprint. The question that must be resolved is what type of vegetation will be planted, how will the space be used, what functions do we want the space to provide, and what human values do we want the space to reflect.

The City Code may require a Habitat Management Plan (HMP) for the proposed Convention Center expansion project. The HMP would define precisely any project impacts and propose mitigation to compensate for the impacts. If required, the HMP mitigation elements could be formulated (at least in part) from this analysis of existing habitat and habitat management alternatives.

The PFD is also considering shoreline enhancement between the Centennial Trail and the riverbank. Shoreline enhancement is a separate issue from the Convention Center, but elements of the shoreline enhancement plan could be integrated into the HMP if the HMP is required. This report evaluates the condition of the shoreline and potential ways it can be stabilized to improve water quality and stop erosion, provides a description of the existing plant community, and makes recommendations as to how the riverbank on both sides of the Centennial Trail can be enhanced in the context of functions and values.

2.0: Habitat Discussion

In natural landscapes, some vegetation occurs alone, while other vegetation occurs in clumps with either like or unlike species. This provides the spacial diversity important to wildlife for thermal protection, security refuge, and migration paths. The arrangement and degree of interspersion of plant community types is an important determining factor in wildlife utilization of a habitat. Complex structural patterns that are important to wildlife include: curving edges, transition areas between plant communities, variable patch size, and high degree of interspersion between species. Desirable habitat has open areas interspersed with clusters of vegetation, several horizontal layers, and a variable structural pattern.

The structural diversity provided by logs of various species, lengths, diameters, and state of composition, woody debris, herbs, shrubs, and trees creates habitat for a variety of small mammals and ground nesting birds. They provide travel routes, perch sites, cover, and thermal refuge. Habitat value increases in proportion to variety in microhabitat types (herbaceous cover, shrub habitat, and snags). For example, snags provide food, habitat and substrate for a variety of plants and animals. Cavity nesting birds use them for shelter, insects live under their bark, and the decaying wood provides substrate for mosses, liverworts, lichens, and fungi.

The extent of riparian zone use by birds and other wildlife is species specific and determined by seasonal life stage requirements such as reproduction, molting, migration, and wintering. Principal factors influencing the use of a particular habitat include habitat size, structural diversity, species richness of vegetative cover, food availability on a seasonal basis, vegetative class interspersion, canopy, vegetative width, upland habitat/adjacent forest acreage, contaminants, human disturbance, location, and the presence or absence of other species specific habitat requirements.

Cover requirements vary among species so it is essential for habitat to provide a variety of cover types. The Spokane River corridor provides several important habitat types essential for migrating, foraging, wintering, breeding, nesting, and perching. The subject property offers good opportunities for perching. However, tree and shrub density in the riverbank zone are not adequate to meet the breeding, wintering and migration habitat requirements of most bird species. Small mammals make limited use of the site.

Human disturbance in the downtown area interferes with wildlife use. Human activity diminishes habitat quality due to the narrow width of the vegetated zone. The adjacent habitat (300 foot perimeter) lacks snags, a significant number of trees with a diameter greater than 10 inches or cavities larger than 2 inches, evergreens with greater than 80% canopy closure, and native prairie or tilled land with waste grain. The terrace has an inadequate number of native fruit, cone, or mast bearing food trees. In short, the habitat quality for birds and small mammals is very low.

3.0: Riparian Buffer Functions and Values

Riverfront Park was created with a vision that our community would gather here to celebrate special occasions and the natural beauty of the Spokane River. Riverfront Park is a show piece that promotes our community, draws tourism, and breathes economic vitality into the area. These things are values, processes, and attributes that are valuable or beneficial to society. From a human perspective, values of the site are relatively high due to the scenic beauty of the river. Human values define both the historical and current use of the area including recreational opportunities in the park and along the Centennial Trail, commercial development in and around the park, and high intensity human activity promoted in the center of our City.

Human values also inspire us to preserve, maintain, and enhance the area to the fullest extent possible because the high degree of human activity takes a toll on vegetation and wildlife along the shoreline. The following section describes the existing vegetative canopies and identifies areas where human traffic has had a negative impact on vegetation and the shoreline. The report proposes actions that can reduce shoreline degradation while improving habitat functions and enhancing the esthetic beauty of the site. The proposed actions are in the form of alternatives that provide the PFD a range of options to consider in formulating a final design for the site. The options include vegetative treatments in the theme of a manicured park, native plantings that grow wild and are never pruned, mowed, or manicured, or a combination of wild and manicured vegetative treatments.

South Side of the Centennial Trail

Site Description

A single row of 14 sycamore trees is planted on roughly 60 foot centers along the South edge of the Centennial Trail between the Division Street Bridge and the INB Performing Arts Center. These mature trees provide a closed leafy canopy above the trail and shade the south shoreline of the river. Between the Division Street bridge and the east edge of the Shenanigan's building, impervious surface covers everything but a 20 foot wide landscaping strip that borders the south side of the Centennial Trail. This manicured area has a landscaping bark ground cover, a statue, a couple of transformers, buried utility lines, and small patches of native and non-native shrubs. The shrubs are shaped and trimmed regularly to provide a neat manicured look.

The landscaping strip narrows between Shenanigan's and the Centennial Trail where only four sycamores are planted in the strip. From the Centennial Trail, an 18-20 foot wide landscaping strip extends 120 feet south on the west side of the Shenanigan's building. This island of landscape bark has a tree overstory including Ponderosa pine, maple and spruce. The shrub understory includes some non-natives as well as the native

species Red-osier dogwood, serviceberry, and Oregon grape. The shrubs are all trimmed regularly to provide a neat manicured look.

From this landscaping strip on the west side of Shenanigan's a grassy park extends about 400 feet west to the Convention Center West Building. This vegetated park varies between 70 and 120 feet in width from north to south. The park consists of mowed turf grass with gravel walking trails leading to and circling the Jodi Pinto wooden seating arbor. The arbor and paths are surrounded by neat hedges and a mixture of native and non-native manicured shrubs. This landscaped area is bordered on the north by sycamores and on the south by another landscaping strip with a mixed conifer and deciduous tree overstory and a manicured shrub overstory with the same mix of native and non-native species.

The area south of the Centennial Trail is a park designed for human enjoyment. The turf grass areas are designed for recreation. The trees and shrubs in the landscaping strips are manicured for human esthetics but also provide a small measure of habitat for the few bird species that utilize this urban environment. Except for ducks and geese, which are a problem, the park landscape south of the Centennial Trail provides very low quality habitat for resident and neotropical migratory bird species due to its close proximity to human activity on the Centennial Trail and in the park.

Proposed Changes to the Existing Condition

The new Convention Center addition will be set back further from the river than the existing Shenanigan's building and parking lot footprint. This offers a unique opportunity to shrink the paved footprint and expand the vegetated footprint. The following options include vegetative treatments in the theme of a manicured park, native plantings that grow wild and are never pruned, mowed, or manicured, or a combination of wild and manicured vegetative treatments.

Alternatives on the South of the Trail

- 1) Retain the existing park theme of mowed turf grasses and islands of manicured woody vegetation. Expand manicured park theme into areas where impervious surfaces will be removed. Match the existing landscaping theme by planting new islands of native and non-native shrubs and dress with landscape bark to control weeds. The shrub planting list could be narrowed to include only native species to increase habitat value.
- 2) Expand the existing park theme of mowed turf grasses surrounding islands of woody vegetation, but stop pruning and manicuring the islands of woody vegetation. Remove the landscaping bark, plant the islands with native bunch grasses and herbaceous species, and let the islands grow wild. Control weeds in the shrub islands, but avoid them with mowers. The goal would be to increase the size and density of shrub patches to improve wildlife habitat.
- 3) In areas where impervious surfaces will be removed, change the theme from manicured park to a wildlands look with 100% native plants. The area would not be mowed, pruned, or manicured. Implement an aggressive weed control plan in the area. Add low profile fencing and signs to keep the public on the trail and out of these designated habitat areas. Island planting plans are included in Appendix 1.

Alternatives Analysis

The area of impervious surface removal on the Shenanigan's property is small. There will also be a small area of impervious surface gain on the west of Shenanigans so the net increase of potential wildlife habitat is very small. Even if all of the available area without impervious surface on the south side of the Centennial Trail was converted to wildlands with multiple canopy layers of dense vegetation, the patch size would be too small to be of much value to wildlife. A few decades from now when new plantings matured to provide multiple canopy layers, structural diversity and species richness, the habitat would still not meet the habitat requirements of most bird species. The site would still lack sufficient patch width, food availability on a seasonal basis, acres of open upland habitat, and adjacent forest acreage adequate to meet the breeding, wintering and migration habitat requirements of most bird species. Birds would still have to deal with contaminants, human disturbance, and the absence of other species specific habitat requirements.

The PFD may elect to convert all of the existing available area into native wildlife habitat, but there will still be little wildlife to enjoy it. However, if wildlands is the concept the PFD wishes to embrace, it is possible to increase clusters of vegetation, the availability of food sources, degree of interspersions of plant species and community types, number of horizontal layers, and a create variable structural pattern consisting of all native species.

Only if this wildlands landscape approach is applied to the south side of the trail, could it also be implemented on the north side of the trail. The non-native sycamores on the south side of the trail cast a shadow on the north side of the trail making it impossible to plant the riverbank with native aspen and cottonwood trees that require full sunlight. The shade of existing non-native willows along the riverbank further complicates that task. Converting the tree canopy along the trail from a community dominated by non-native species to all native species would involve the removal of most existing trees. Most of the middle age tree canopy would have to be cut down and replaced with younger trees that would take many years to mature. That would be a very ambitious project so I would recommend leaving the existing tree canopy until it becomes old and senescent in a few of decades. When old trees die and the canopy opens up it will be possible for native species like aspen, alder, and cottonwood to fill the vacant niche and thrive.

North Side of the Centennial Trail

Site Description

A single row of stately sycamores defines the south side of the trail. This shaded canopy also defines what will grow on the north side of the trail along the river bank. Cottonwoods and aspens require full sun so they only grow in one small area where there are holes in the shade canopy. The remainder of the tree canopy is defined by willows and a few Ponderosa pines. Where these two species grow, the shrub and herbaceous understory is generally very sparse or bare ground. Less well represented are apple and locust trees. Dense shrub patches grow in the spaces between trees. This variation adds to the visual appeal and esthetic beauty of the landscape. The canopy openings provide gorgeous views of the river under low hanging willows. In the spring fragrant blossoms

Proposed Changes to the Existing Condition

In the project area, human activity is very high on the Centennial Trail. The paved trail is only a few feet from the water's edge. In some areas, there is no understory vegetation to inhibit human access to the river. Due to foot traffic in many locations, the soil is bare from the trail to the water's edge. Even dense thorny blackberry bushes are not even a deterrent to people determined to reach the water's edge. One goal of this report is to identify areas where shoreline access is having a negative impact on vegetation and stream bank stability. A second goal is to suggest ways to prevent access to the water by filling gaps in the shrub canopy. A third goal is to suggest vegetative plantings to stabilize the shoreline where foot traffic is causing erosion. A fourth goal is to improve habitat quality on the river bank through vegetative enhancement.

Alternatives on the North of the Trail

- 1) Keep the remaining mixture of native and introduced tree and shrub species and fill in gaps in the canopy with native shrub species. Utilize the impenetrable thickets of blackberry to prevent access to the river bank.
- 2) Where trails to the river's edge have been worn through the shrub canopy, large rocks could be used to hide trails, deny use of the trails, and deny access to the riverbank. Plant thorny shrubs between the large rocks to discourage access to the riverbank that results in bank erosion.
- 3) Plant additional thorny native shrubs like rose or hawthorn on trails to discourage access to the river. Plant additional native shrubs, native grasses, and native herbaceous species to fill in gaps in the canopy.
- 4) Cut out some of the introduced shrub species like blackberry and remove root masses. Supplement mechanical control with aggressive chemical control of the root crowns and new sprouts to prevent new canes from growing. Remove the top soil layer containing seeds and replace with high quality top soil.
- 5) Cover bare ground with native grasses, herbaceous species, creeping shrubs, and shrubs of various heights.
- 6) In all areas with noxious weed infestations, scrape off the top 6 inches of soil and replace with 6 inches of high quality top soil. Hydroseed with native grasses and herbaceous species.
- 7) Add low profile fencing and signs, at least temporarily, to keep the public on the Centennial Trail and out of designated habitat areas and/or newly planted areas until the grasses are well established.
- 8) Remove all non-native vegetation north of the trail and replace with native plants. This would entail the removal of the blackberry, honey willows, apple trees, and black locus. The tree canopy would be replaced with aspens and cottonwoods and other native woody species. This radical strategy can only be implemented if sycamores on the south side of the trail (that shade the north side of the trail) are also removed.
- 9) Salvage plants from the Shenanigan's property when landscaping strips are removed for the Convention Center expansion and replant the salvaged shrubs along the river.
- 10) Maintain the north side of the trail as it is currently maintained.

Alternatives Analysis

Two species of aggressive, non-native blackberry bushes are invading large patches on the shoreline. Blackberries can form suckers from the roots. Blackberry canes that touch the ground sprout roots that form new plants. Himalayan blackberry quickly forms impenetrable thickets, consisting of both dead and live canes and will become impossible to control unless steps are taken to prevent its spread along the riverbank. Mechanical control is possible but care must be taken to remove the roots or new plants will sprout from the crowns. Chemical control on sprouts from seeds or crowns should be used as a follow-up as necessary to stop re-establishment. Chemical controls alone should not be considered because the toxic berries would pose a serious threat to both people and wildlife. Blackberry elimination and replacement and revegetation of the shoreline is a major undertaking. Another alternative is to maintain the existing expanse of blackberries but take annual aggressive measures to prevent it from spreading any further along the shoreline than the existing condition.

People have worn trails through the shrub canopy to the river in several locations, even through some of the less dense blackberry patches. Blackberry canes can be trained to cover unwanted human trails. During construction of the new Convention Center, large boulders will be removed from the foundation. These large rocks could be stockpiled and used along the shoreline to block trails to the river. Large shrubs and root wads from the Shenanigans site could be transplanted to block trails to the river. Big rocks could be used to stabilize the riverbank, backfilled with dirt, and planted with shrubs and grasses. Rock piles also provide habitat for birds and small mammals.

People want private moments and scenic vistas along the trail. Some of the problems on the shoreline may stem from the fact that scenic views are restricted by vegetation along the trail. Low hanging trees and dense shrubs prevent quality views of the river in some of the project area. Vegetation on the shoreline could be opened up at a couple of locations to encourage public access to the shoreline. It might be possible to create a grassy knoll on the riverbank with durable turf grass where people could enjoy views that are not obscured by trees and shrubs. Additional seating areas with good river views could be provided along the trail.

The PFD might consider one or more additional overlooks with concrete benches at locations where there are bank erosion problems. Concrete foundations would stabilize the eroding bank and provide additional controlled access points where people can see the water. It might be possible to preserve the existing Shenanigan's patio and add some concrete benches. Low growing shrubs could be planted on the riverbank so views would not be obstructed from the trail yet access to the shoreline would be denied. Controlled access points could make the riverbank more accessible in some areas while dense vegetative plantings would make the shoreline inaccessible in all other areas. Increase native shrub density while maintaining or creating view corridors in other areas.

In several locations, the riverbank is dominated by patches of noxious or invasive weeds. Thick patches of the allelopathic species wormwood and knapweed are prevalent on the riverbank and choke out other species. Patches of sod grasses and bunch grasses are very sparse, especially beneath the willows and Ponderosa pines. Mallow is a low growing weedy plant that also covers large areas of the ground. The top 6 inches of top soil should be removed in all areas where invasive weeds are present and the soils should be hauled off-site. Six inches of high quality top soil should be added to excavated areas

then hydroseeded with native grasses and herbaceous species. Add post and rope type fencing and signage to keep people out of enhancement areas, if not permanently, at least until the vegetation is well established.

Low growing ground cover like knickinick and creeping Oregon grape could be planted to protect exposed soils. These woody species are very durable and would do a fine job of stabilizing soils while providing an attractive ground cover. The creeping species will fill in nicely, but should be planted at relatively high density because they creep slowly. Like all low growing species, weeds still grow through the surface mat. In this case bunchgrasses will grow through the mat because weeds will be controlled.

Control the noxious and opportunistic weed species that dominate the shoreline and replace with native species to increase habitat value. Plant grasses, an herbaceous canopy, and a creeping ground cover to replace bare soils. Where a tree canopy exists, plant a shrub understory to increase structural diversity and habitat value. The shoreline should be enhanced with native tree, shrub, herb, and grass species. The replication of natural spatial relationships, structural complexity, vertical stratification, and microhabitat diversity should be stressed in the planting design to achieve a mosaic of open areas and dense tree and shrub clusters. Vegetation should be planted with other species and classes to create areas of dense vegetation.

The habitat value of the project area is very low. The plant and animal communities have been greatly simplified. It is not possible to significantly improve riparian dependent bird/mammal habitat diversity due to the narrow width of the river bank zone and the degree of existing site disturbance. However, vegetative enhancement can increase landscape diversity and promote habitat elements that are scarce or absent, provide additional refugia, resting, perches, cover, and foraging opportunities for the resident and migratory bird species that utilize the river corridor and may utilize this site on occasion. Enhancement would allow the PFD to reclaim degraded habitat, enhance existing habitat, stabilize the shoreline, and improve view corridors and esthetic value compared to the existing condition. Part of the funds allocated for enhancement work should be reserved for five years of annual weed monitoring and control.

The following pages include a list of species identified on the site (Table 1) and a list of native species suitable for planting at the site for enhancement purposes (Table 2). Also included is a site plan map (Figure 1) and sketches of the plant cluster locations superimposed on a site plan map (Figure 2 and Figure 3). The plants species identified on the site and listed in Table 1 are identified by abbreviation on site plan maps Figures 2 and 3 in the approximate locations of corresponding plant clusters. Figure 2 shows the east part of the project area. Figure 3 shows the west part of the project area.

Table 1 is a list of species identified on the shoreline.

	Common name	Scientific name	Map abbreviation	
Herbs:	yarrow	<i>Achillea millefolium</i>	ACMI	
	kinnikinnick	<i>Arctostaphylos uva-ursi</i>	ARUR	
	wormwood	<i>Artemisia absinthium</i>	ARAB	
	spotted knapweed	<i>Centaurea maculosa</i>	CEMA	
	diffuse knapweed	<i>Centaurea diffusa</i>	CEDI	
	Canadian thistle	<i>Cirsium arvense</i>	CIAR	
	clematis	<i>Clematis columbiana</i>	CLCO	
	willow weed	<i>Epilobium watsonii</i>	EPWA	
	St. Johnswort	<i>Hypericum perforatum</i>	HYPE	
	prickly lettuce	<i>Lactuca serriola</i>	LASE	
	dalmatian toadflax	<i>Linaria dalmatica</i>	LIDA	
	cheeseweed	<i>Malva neglecta</i>	MANE	
	medic	<i>Medicago falcata</i>	MEFA	
	tumble mustard	<i>Sisymbrium altissimum</i>	SIAL	
	mullein	<i>Verbascum thapsus</i>	VETH	
	clematis	<i>Clematis lingusticifolia</i>	CLLI	
	Grasses	quack grass	<i>Agropyron repens</i>	AGRE
Junegrass		<i>Koeleria cristata</i>	KOCR	
canary grass		<i>Phalaris arundinacea</i>	PHAR	
bluegrass		<i>Poa pratensis</i>	POPR	
Idaho fescue		<i>Fescuta idahoensis</i>	FEID	
Shrubs	serviceberry	<i>Amelanchier alnifolia</i>	AMAL	
	tall Oregon grape	<i>Berberis aquifolium</i>	BEAQ	
	creeping Oregon grape	<i>Berberis repens</i>	BERE	
	red osier dogwood	<i>Cornus stolonifera</i>	COST	
	mock orange	<i>Philadelphus lewisii</i>	PHLE	
	chokecherry	<i>Prunus virginiana</i>	PRVI	
	golden current	<i>Ribes aureum</i>	RIAU	
	wild rose	<i>Rosa woodsii</i>	ROWO	
	rose	<i>Rosa sp.</i>	ROSP	
	blackberry	<i>Rubus discolor</i>	RUDI	
	snowberry	<i>Symphoricarpos albus</i>	SYAL	
	Trees:	maple	<i>Acer sp.</i>	ACSP
		apple	<i>Malus domestica</i>	MADO
ponderosa pine		<i>Pinus ponderosa</i>	PIPO	
sycamore		<i>Platanus occidentalis</i>	PLOC	
quaking aspen		<i>Populus tremula</i>	POTR	
cottonwood		<i>Populus trichocarpa</i>	POTR	
cherry		<i>Prunus sp.</i>	PRDP	
Douglas fir		<i>Pseudotsuga menziesii</i>	PSME	
smooth sumac		<i>Rhus glabra</i>	RHGL	
black locust		<i>Robinia pseudo-acacia</i>	ROAC	
willow		<i>Salix spp.</i>	SASP	
elderberry		<i>Sambucus cerulea</i>	SACE	
tansy		<i>Tanacetum potentilloides</i>	TAPO	
yellow salsify		<i>Tragopogon dubius</i>	TRDU	
nettles	<i>Urtica dioica</i>	URDI		

The locations of species clusters are labeled by abbreviation on Figure 1 Site Map.

Table 2 is a list of native plants suitable for enhancement of the shoreline and landscaping strips.

alder *Alnus sp.*
serviceberry (*Amelanchier alnifolia*)
kinnikinnik *Arctostaphylos uva-ursi*
tall Oregon grape (*Berberis aquifolium*)
creeping Oregon grape (*Berberis repens*)
Water birch (*Betula occidentalis*)
red osier dogwood (*Cornus stolonifera*)
black hawthorn (*Crataegus douglasii*)
rocky mountain juniper (*Juniperus scopulorum*)
Mock orange (*Philadelphus Lewisii*)
phlox (*Phlox caespitosa*)
phlox (*Phlox longifolia*)
Ponderosa pine (*Pinus ponderosa*)
Quaking aspen (*Populus tremuloides*)
Black cottonwood (*Populus trichocarpa*)
bitter cherry (*Prunus emarginata*)
chokecherry (*Prunus virginiana*)
Common chokecherry (*Prunus virginiana*)
Douglas fir (*Pseudotsuga menziesii*)
ninebark (*Physocarpus malvaceus*)
golden current (*Ribes aureum*)
Nootka rose (*Rosa nutkana*)
wild rose (*Rosa woodsii*)
coyote willow (*Salix exigua*)
Various willows (*Salix spp.*)
Common snowberry (*Symphoricarpos albus*)
fescue (*Fescuta scabrella*)
bulbous bluegrass (*Poa bulbosa*)
Sandberg bluegrass (*Poa sandbergii*)
bluebunch wheatgrass (*Agropyron spicatum*)
Idaho fescue (*Festuca idahoensis*)
prarie junegrass (*Koeleria cristata*)
Sandberg bluegrass (*Poa secunda*)

Figure 1

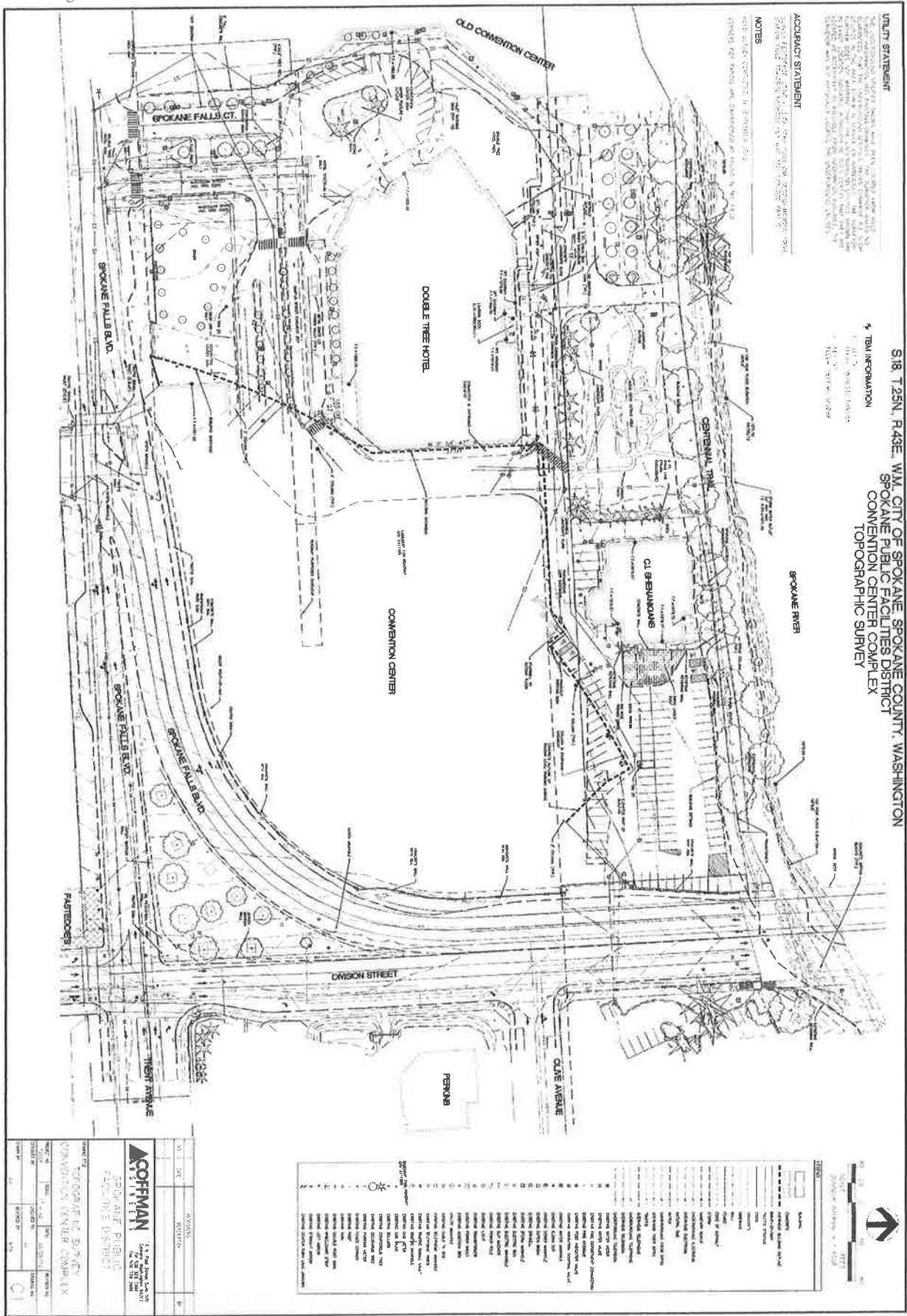
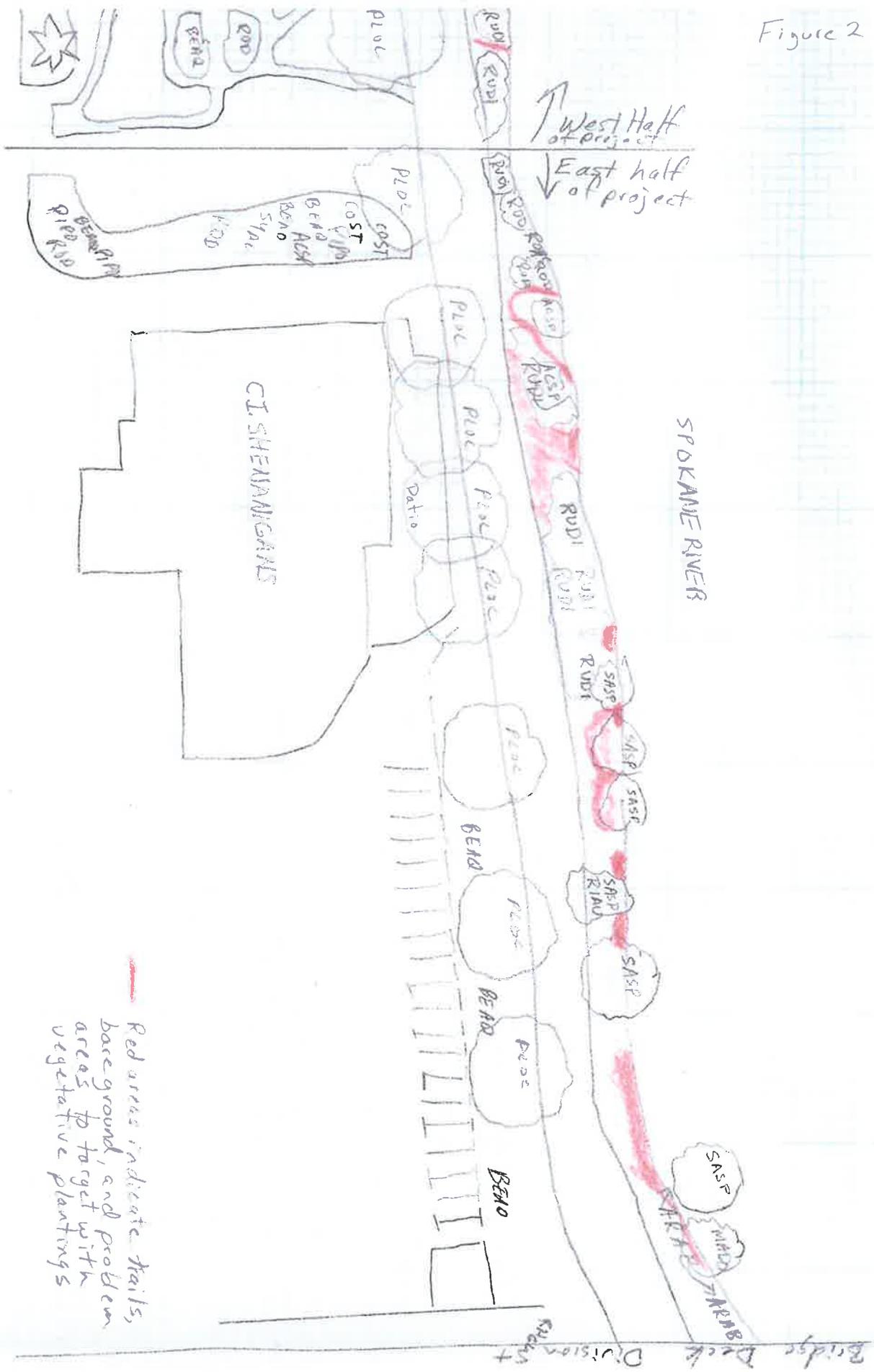


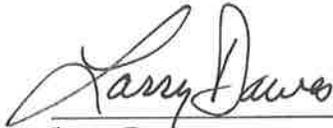
Figure 2



Red areas indicate trails, base ground, and problem areas to target with vegetative plantings

The project biologist will be available to discuss enhancement options at your convenience. Please call if you have questions.

Within the limitations of scope, schedule, and budget, BSW services have been executed in accordance with best available science and generally accepted professional practices for the conditions at the time the work was performed. This report is not intended to represent a legal opinion. Specifically, there is no positive or negative recommendation towards the purchase, sale, lease, or construction on the subject property. No warrant, expressed or implied, is made.



11-2-2012

Larry Dawes

Date

Principal Biologist

Biology Soil & Water, Inc.

3102 N. Girard Road

Spokane Valley, WA 99212-1529

Phone 509-327-2684

Email: bswinc@icehouse.net