Appendices

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Table A-1: Oak Creek Open Space Management Plan Recommendations				
Aquatic habitat	**Action**	**Result**	**Next Step**	**Priority**
Management	Conserve riparian forest for channel migration buffer.	Reduce land loss due to channel migration	ID narrow buffer locations near channel bends and flag in riparian management for potential channel migration.	L
Management	Measure water quality at additional stream points on Oak Creek and tributaries, with special consideration to using macroinvertebrate studies where feasible.	Improve data base pertaining specifically to Oak Creek Open Space with upstream and downstream data. Flag bacteria, temperature and turbidity.	ID sites on Oak Creek and tribs.	M
Management	Conserve existing in-stream woody debris.	Maintain habitat connectivity and complexity	Periodic monitoring of large wood debris.	H
Restoration	Reconnect floodplain off-channel habitats and replace fish barrier culverts.	Improve habitat connectivity and complexity	ID sites on Oak Creek and tribs.	H
Restoration	Install stable log jams for in-stream habitat.	Improve habitat connectivity and complexity	ID sites on Oak Creek and tribs.	L
Riparian habitat	**Action**	**Result**	**Next Step**	**Priority**
Management / Education	Preserve remaining riparian corridor on residential property through landowner education and easements.	Maintain contiguous riparian corridor	Outreach to neighboring riparian landowners ID sites on Calapooia	H
Restoration	Control invasive species at 'point' sites, and aggressively replant with native species that will eventually shade out invasives.	Improve overall habitat values and functions	ID sites using existing vegetation maps	H
Restoration	Plant armored banks and promote bioengineering in place of riprap where stabilization is necessary	Improve riparian function	ID sites on Calapooia	L
Restoration	Improve streamside shading with tall riparian trees at specific sites.	Improved water quality and riparian habitat	Plan planting for site in northeast portion of site. (See Figure A-2)	M
Restoration / Community engagement /Education	Establish or widen wooded buffers between neighbors and site resources, especially near sloughs and water bodies.	Improve overall habitat values / shade	ID landowners for contact.	M
Forest Habitat	**Action**	**Result**	**Next Step**	**Priority**
Management	Preserve old and decrepit trees, with minimal pruning, unless they pose a health risk. Retaining 8-14 good quality snags per acre.	Preserve high value somewhat rare habitat	ID in long-term management objectives and education	H
Management	Annual monitoring of thin-leaved peavine populations.	Maintain overall habitat values	Develop protection and monitoring plan	H

Table A-1 continued				
Management	*Immediately* control and eradicate if possible the small, scattered populations of false brome, Robert's geranium before they increase to unmanageable levels.	Improve overall habitat values	Pull immediately and develop monitoring plan	**H**
Restoration	Control competing vegetation at thin-leaved pea vine sites (e.g. Himalayan blackberry) as necessary	Maintain overall habitat values	Control invasives at specific sites shown on map	**H**
Restoration	Remove fir trees that are crowding oaks in mixed forest and mixed woodland areas. Protect areas from invasive vegetation.	Restore oak woodland habitat and oak longevity	ID trees for removal	M
Wetland Habitat	**Action**	**Result**	**Next Step**	**Priority**
Management	Riparian communities including willow-shrub, emergent grasses and sedges (cutgrass, sloughgrass) should be encouraged and cattails discouraged.	Improve avian habitat and winter food supply	Monitor extent of cattail populations and work to diversify dense stands of cattail.	L
Management	Annual monitoring for Ludwigia peploides and hexapetala	Protect Calapooia backwaters and alcoves from nearby invasive species	Include in maintenance plan, work with Cooperative Weed Management Area group	H
Restoration	Pursue wetland mitigation bank and/or BPA habitat mitigation to help fund habitat restoration	Improve wetland habitats	Prioritize sites using existing wetlands maps	L
Restoration	Immediately remove priority aquatic invasive species, such as yellow flag iris.	Improve wetland habitats	Seek grant funding	**H**
Restoration	Manage widespread invasives; Reed canary grass, and blackberry in *key* locations (i.e. potential Western pond turtle nesting areas) to protect vulnerable habitat. Replace with Spiraea, tufted hairgrass, juncus and sedges.	Improve overall habitat values	Prioritize sites	H
Grassland Habitat	**Action**	**Result**	**Next Step**	**Priority**
Management	Encourage people to stay on trails, and trails should be routed through forest and away from grassland habitats where possible.	Reduce disturbance to sensitive species	Develop trail maintenance and expansion plan	H
Management	Test soils and develop a vegetation management and planting plan for the old landfill areas.	Improve overall habitat values	Assessment of specific site	M

Table A-1 Continued				
Restoration	Remove a few younger trees between adjacent grassland and shrub habitats to increase the grassland patch size and make it contiguous with nearby habitat patches	Increase grassland patch size	ID specific trees for removal	H
Restoration	Control* invasive vegetation patches ('points' versus 'polygons') on potential grassland habitat before patches become larger infestations. Target species for removal: Reed's canary grass, tall fescue, creeping bentgrass, Armenian blackberries. Replace with: onespike oatgrass, Oregon bentgrass or rough bentgrass, and for wetter areas, tufted hairgrass, native juncus and sedges.	Provide better nesting structure for many grassland species	ID specific patches for removal	H
Restoration	Introduce rare plants (threatened or endangered or species of concern) once native prairie is restored. I.e. Lomatium bradshawii	Build habitat for endangered species	Control invasives, first, at specif sites shown on map	M
Restoration	Remove young overtopping firs in the vacinity of oaks to encourage growth of oaks and oak savanah.	Preserve remnant oak savanna	ID specific patches for removal	M
Restoration	Assess and stabilize landfill contents, remove or process as necessary.	Resolve potential health water quality and health issue	Assessment of specific site	H
* Vegetation removal/ spraying/ mowing should occur after most birds fledge (late June or July) or be done on a small proportion of the habitat at a time to minimize disturbance during sensitive nesting periods				
Community	**Action**	**Result**	**Next Step**	**Priority**
Youth Education	Field trips to Oak Creek Open Space to practice hands-on watershed science, explore habitats, and conduct monitoring and stewardship activities.	Increased understanding of and respect for the ecological value of the site.	Calapooia Watershed Council plans and collaborates with schools.	**H**
Community Engagement	Community education through walking tours with experts, workshops*, brochures and interpretive signs about site resources.	Increase community awareness and appreciation of the site.	Develop outreach materials and plan. Potentially partner with HOA.	H
Community Engagement	Community engagement through volunteer stewardship events and annual celebration.	Increase community awareness and appreciation of the site, and improve conditions.	Develop outreach materials and plan. Potentially partner with HOA.	H
Recreation Management	Develop trail connecting old landfill area to the Oak Creek Greenbelt trail.	Increase community passive recreational use of the site, keep users on path.	After landfill areas are treated, pending further landfill assessment, develop trail design for	M

			least impact to habitats.	
Table A-1 Continued				
Recreation Management	Improve trail drainage and stream crossings.	Increase community passive recreational use of the site, keep users on path.	Identify stream/slough crossings and desired design.	M
Recreation Management	Discourage visitors from going off trails with signage and education about sensitive habitats.	Increase responsible use of the site; keep users on path.	Plan in conjunction with interpretive signs.	M
Recreation Management	Disallow off-leash dogs and provide for pet waste disposal.	Protect ground nesting birds and other wildlife, and protect water quality.	Plan in conjunction with interpretive signs, and community education events.	**H**
*Education topics to include proper management of invasive species, importance of controlling dogs and cats outdoors during bird ground nesting season, local hydrology and flooding, clarify property boundaries and address encroachment issues, and stormwater management.				

Table A-2: Potential Vegetation Cover Type Change (See Figure A-1)						
Cover Type	**Dominate Cover Description**	**Potential Cover Type**	**Potential Cover Description**	**Fig. A-2 ID**	**Acres**	**Habitat Type**
Forest Habitat						
Deciduous Woodland	Oregon white oak-Oregon ash/mowed lawns-herbicided areas	Deciduous Forest	Oregon white oak-Oregon ash forest	17	0.29	Mosaic
Deciduous Woodland	Oregon white oak/meadow foxtail-spreading rush-tall fescue	Savanna	Oregon white oak savanna	20	0.36	Mosaic
Deciduous Woodland	Oregon white oak/lawn grasses	Savanna	Oregon white oak savanna	23	0.17	Uplands
Deciduous Woodland	Oregon white oak-Oregon ash/Himalayan blackberry-Suksdorf's hawthorn-Nootka rose	Deciduous Forest	Oregon white oak-Oregon ash forest	29	2.03	Uplands
Deciduous Woodland	Oregon ash/mowed grasses and forbs	Deciduous Forest	Oregon ash forest	1	0.09	Wetlands
Deciduous Woodland	Oregon ash/Nootka rose/reed canarygrass-spreading rush	Deciduous Forest	Oregon ash forest	6	0.92	Wetlands
Deciduous Woodland	Oregon ash-Suksdorf's hawthorn/Nootka rose-Douglas spiraea/reed canarygrass	Deciduous Forest	Oregon ash forest AND/OR willow shrubland	43	1.66	Wetlands
Deciduous Woodland	Pacific willow/Sitka willow-Hooker's willow/Himalayan blackberry/reed canarygrass	Deciduous Forest	Oregon ash-Pacific willow-black cottonwood forest	54	4.64	Wetlands
Mixed Forest	Oregon white oak-Douglas-fir/Oregon ash/Pacific serviceberry-common snowberry-poisonoak/fringecup-Pacific dewberry	Deciduous Forest	Oregon white oak-Oregon ash forest	15	0.38	Uplands
Mixed Woodland	Oregon white oak-Douglas-fir-Oregon ash/Himalayan blackberry	Mixed Forest	Oregon white oak-Douglas fir-Oregon ash forest	13	0.63	Uplands

Table A-2 Continued						
Cover Type	**Dominate Cover Description**	**Potential Cover Type**	**Potential Cover Description**	**Fig. A-2 ID**	**Acres**	**Habitat Type**
Grassland Habitat						
Herbaceous	common velvetgrass-common teasel-meadow foxtail-pennyroyal-hairy hawkbit-creeping bentgrass-Queen Anne's lace	Mixed Woodland	Native shrubland OR Oregon ash-Oregon white oak-ponderosa pine woodland	19	0.48	Mosaic
Herbaceous	creeping bentgrass-common velvetgrass-meadow foxtail	Deciduous Forest	Oregon ash-Oregon white oak forest OR native shrub community OR Oregon white oak savanna	25, 28	0.48	Mosaic
Herbaceous	meadow foxtail-spreading rush-creeping bentgrass	Deciduous Forest	Oregon ash-Oregon white oak forest OR native shrub community OR Oregon white oak savanna	33	1.23	Mosaic
Herbaceous	chess brome-creeping bentgrass-tall annual willowherb-Canada thistle-field bindweed	Savanna	Oregon white oak savanna/woodland AND wetland prairie OR wetland shrubland	37	3.96	Mosaic
Herbaceous	creeping bentgrass-chess brome-common velvetgrass-small-flowered lotus-coast tarweed-clustered tarweed-common teasel	Deciduous Forest	Oregon white oak-Oregon ash forest OR Oregon white oak savanna	47	0.64	Mosaic
Herbaceous	common velvetgrass-creeping bentgrass-tall fescue-meadow foxtail-sweet vernalgrass	Savanna	Oregon white oak savanna OR upland/wetland prairie	51	1.79	Mosaic
Herbaceous	red fescue-common velvetgrass-hairy hawkbit-Queen Anne's lace	Deciduous Forest	Oregon white oak-Oregon ash forest	7	0.22	Uplands
Herbaceous	tall fescue-redtop	Savanna	Oregon white oak savanna	21,24,27	5.12	Uplands
Herbaceous	lawn grasses	Savanna	Oregon white oak savanna	22	0.18	Uplands
Herbaceous	rough cat's ear-soft brome-white clover-hairy hawkbit-annual fescue-common velvetgrass	Savanna	Oregon white oak savanna OR upland prairie	34	0.68	Uplands
Herbaceous	tall fescue-Canada thistle-spreading hedgeparsley-common vetch-chess brome-field bindweed	Savanna	Oregon white oak savanna/woodland AND wetland prairie OR wetland shrubland	36	3.29	Uplands

Table A-2 Continued						
Cover Type	**Dominate Cover Description**	**Potential Cover Type**	**Potential Cover Description**	**Fig. A-2 ID**	**Acres**	**Habitat Type**
Grassland Habitat						
Herbaceous	tall fescue-Canada thistle-Queen Anne's lace-field bindweed	Savanna	Oregon white oak savanna/woodland AND wetland prairie OR wetland shrubland	38	1.65	Uplands
Herbaceous	Himalayan blackberry/tall fescue-rough cat's ear-oxeye daisy-Queen Anne's lace-vetch-chess brome-Canada thistle	Savanna	Oregon white oak savanna OR upland/wetland prairie	40,42	10.47	Uplands
Herbaceous	Oregon white oak-Douglas-fir/common snowberry-osoberry-Himalayan blackberry/Pacific dewberry-cleavers	Savanna	Oregon white oak forest	45	0.69	Uplands
Herbaceous	redtop-white clover-Queen Anne's lace-tall fescue-rough cat's ear	Savanna	Oregon white oak savanna OR upland prairie	50	0.76	Uplands
Herbaceous	tall fescue-Queen Anne's lace-rough cat's ear	Deciduous Forest	Oregon white oak-Oregon ash-bigleaf maple forest	52	0.40	Uplands
Herbaceous	tall fescue-redtop	Deciduous Forest	Oregon white oak-Oregona ash-black cottonwood-bigleaf maple forest	55	0.33	Uplands
Herbaceous	creeping bentgrass-tall fescue-common teasel	Deciduous Forest	Oregon white oak-Oregona ash-black cottonwood-bigleaf maple forest	59	0.30	Uplands
Herbaceous	reed canarygrass-lawn grasses-white clover-hairy hawkbit	Deciduous Forest	Oregon ash forest OR willow shrubland	2	0.75	Wetlands
Herbaceous	dense sedge-one-sided sedge-prairie rush-American sloughgrass-spike bentgrass	Prairie	Wetland prairie?	3,4,5	8.79	Wetlands
Herbaceous	meadow foxtail-dogfennel-sharp-leaved fluellin-birdsfoot trefoil	Prairie	Wetland prairie?	9	2.33	Wetlands
Herbaceous	lawn grasses	Deciduous Forest	Oregon ash forest	11	0.25	Wetlands
Herbaceous	reed canarygrass	Shrublands	Willow shrubland OR Oregon ash forest OR sedge wetland	14	0.73	Wetlands

Table A-2 Continued						
Cover Type	**Dominate Cover Description**	**Potential Cover Type**	**Potential Cover Description**	**Fig. A-2 ID**	**Acres**	**Habitat Type**
Grassland Habitat						
Herbaceous	reed canarygrass	Shrublands	Willow shrubland OR Oregon ash forest OR sedge wetland	14	0.73	Wetlands
Herbaceous	creeping bentgrass-slough sedge-spreading rush-meadow foxtail	Prairie	Oregon ash forest OR willow shrubland OR wetland prairie	26	5.87	Wetlands
Herbaceous	reed canarygrass	Shrublands	Willow shrubland	31	0.96	Wetlands
Herbaceous	reed canarygrass-creeping bentgrass-chess brome-common spikerush-awl-fruit sedge	Prairie	Oregon ash forest OR wetland prairie	39	0.35	Wetlands
Herbaceous	common spikerush-reed canarygrass-creeping bentgrass	Prairie	sedge wetland	41	0.52	Wetlands
Herbaceous	waterpepper-common spikerush-nodding beggarticks	Prairie	sedge wetland	46	0.48	Wetlands
Herbaceous	cocklebur-nodding beggarticks-dodder-clustered tarweed	Prairie	sedge wetland	48	0.32	Wetlands
Herbaceous	reed canarygrass	Deciduous Forest	Oregon ash forest	57	0.38	Wetlands
Herbaceous	reed canarygrass	Deciduous Forest	Willow shrubland OR Oregon ash forest	10, 12	1.20	Wetlands
Herbaceous/ Shrublands	Himalayan blackberry-Nootka rose/bentgrass-tall fescue	Deciduous Forest	Oregon white oak-Oregona ash-black cottonwood-bigleaf maple forest	56	0.50	Uplands
Ornamental Landscaping	ornamental plants/weed cloth	Prairie	Oregon white oak savanna/woodland AND wetland prairie OR wetland shrubland	35	0.15	Uplands
Shrublands	Himalayan blackberry-Nootka rose/reed canarygrass	Deciduous Forest	Oregon ash-Oregon white oak forest OR native shrub community OR Oregon white oak savanna	30	2.40	Mosaic
Shrublands	English hawthorn-Himalayan blackberry-Suksdorf's hawthorn-Hooker's willow-Oregon ash	Deciduous Forest	Oregon ash-Oregon white oak forest OR native shrub community OR Oregon white oak savanna	32	2.76	Mosaic

Table A-2 Continued						
Cover Type	**Dominate Cover Description**	**Potential Cover Type**	**Potential Cover Description**	**Fig. A-2 ID**	**Acres**	**Habitat Type**
Grassland Habitat						
Shrublands	Nootka rose-Himalayan blackberry-common snowberry	Deciduous Forest	Oregon white oak-Oregon ash forest	8	2.94	Uplands
Shrublands	Himalayan blackberry-Nootka rose-common snowberry/redtop-creeping bentgrass-common velvetgrass	Deciduous Forest	Oregon white oak forest OR native shrubland	16	0.59	Uplands
Shrublands	Suksdorf's hawthorn-English hawthorn-Himalayan blackberry/meadow foxtail	Deciduous Forest	Native shrubland OR Oregon white oak-Oregon ash forest	18	1.02	Uplands
Shrublands	Himalayan blackberry-Nootka rose	Deciduous Forest	Oregon white oak-Oregon ash forest OR Oregon white oak woodland OR Oregon white oak savanna	44	1.62	Uplands
Shrublands	Himalayan blackberry	Deciduous Forest	Oregon white oak-Oregon ash forest OR Oregon white oak savanna	49	0.13	Uplands
Shrublands	Himalayan blackberry	Deciduous Forest	Oregon white oak-Oregon ash-bigleaf maple forest	53,60	0.22	Uplands
Shrublands	Himalayan blackberry-Nootka rose-Pacific ninebark	Deciduous Forest	Oregon white oak-Oregon ash forest OR native shrubland	58	0.59	Uplands

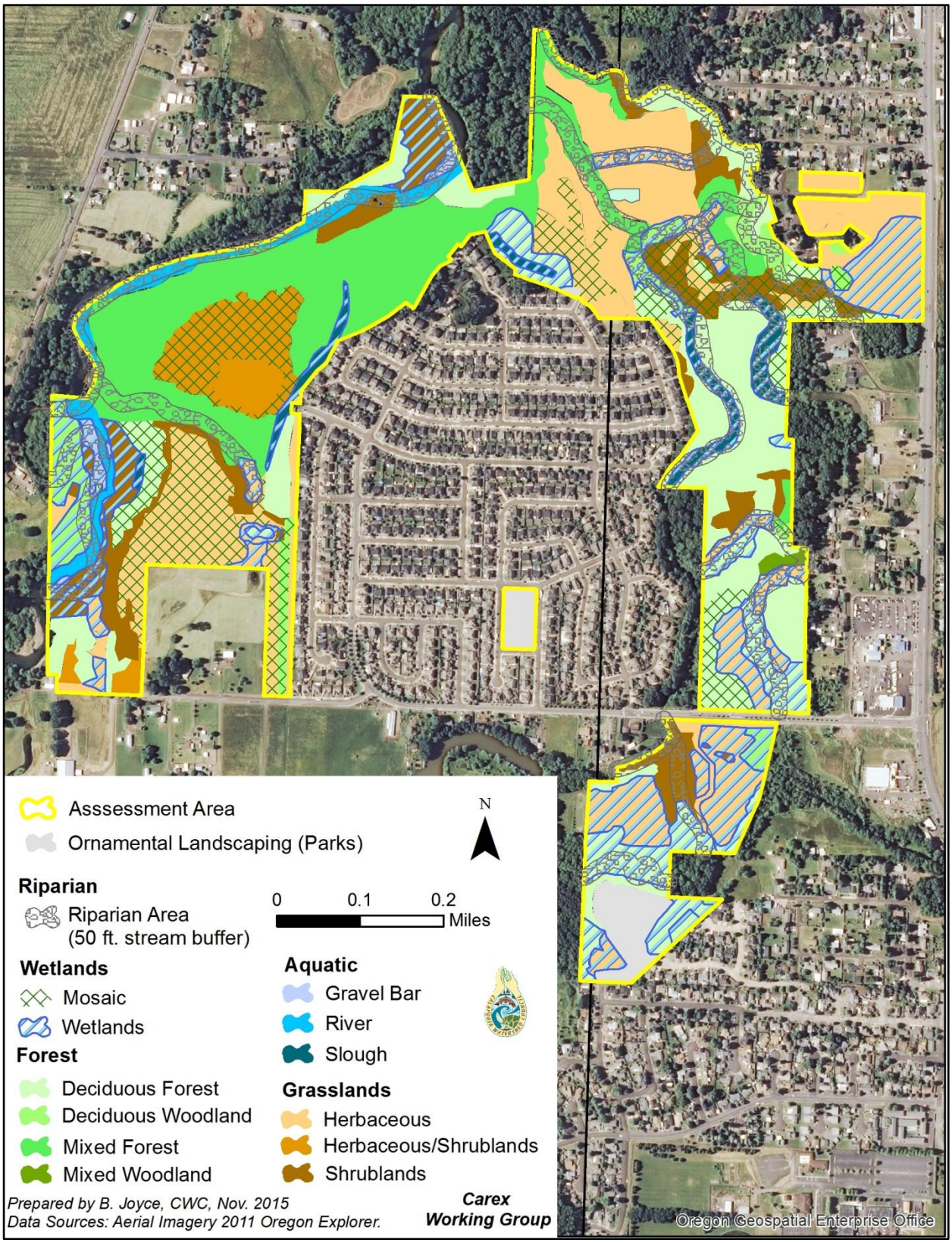

Figure A-1: Habitats based on vegetation cover and hydrology.

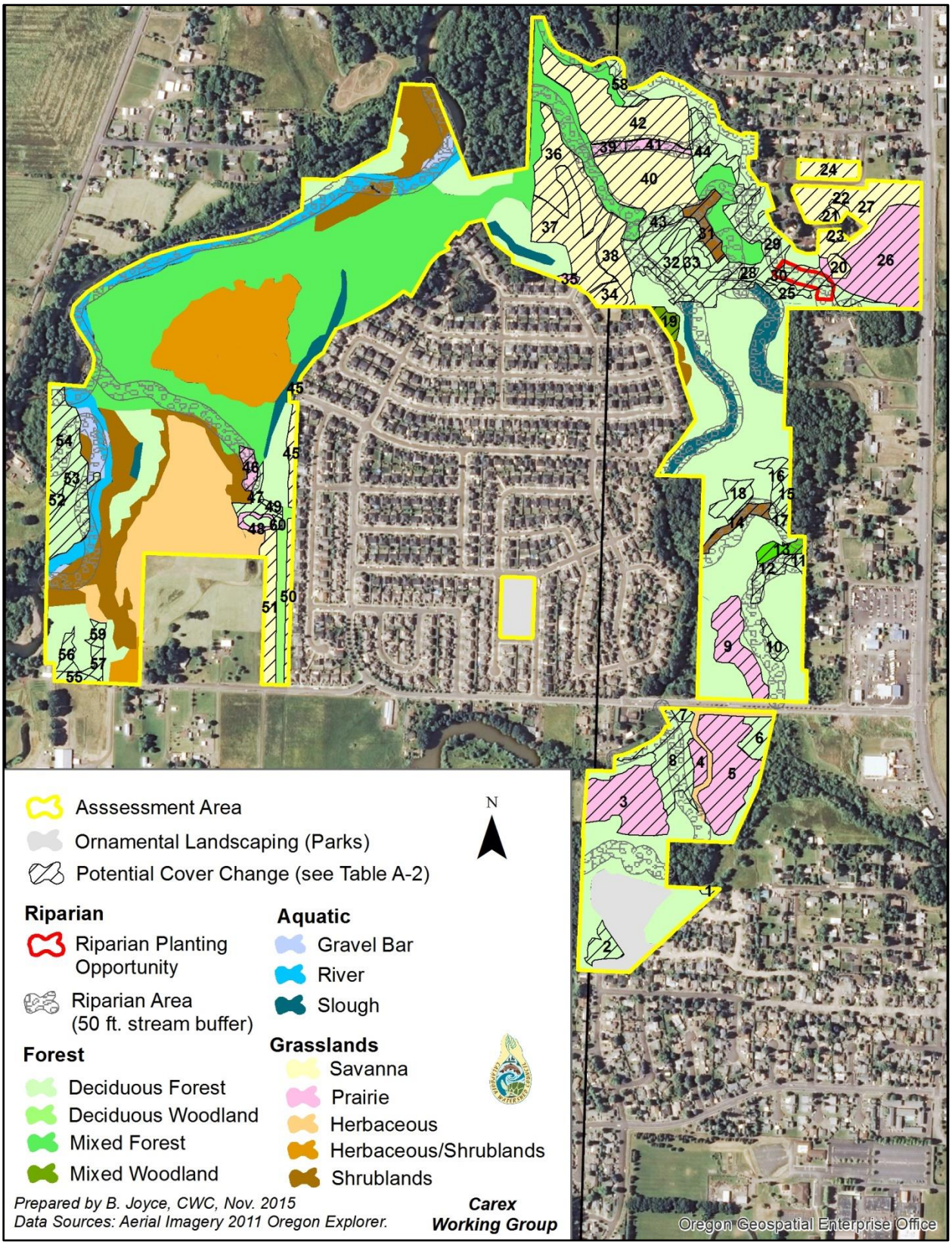

Figure A-2: Potential Vegetation Cover Change and Riparian Planting Area (See Tables A-1 and A-2)

Table A-3: Fish Species in the Calapooia-Albany Assessment project reach (adapted from RDG, 2011)	
Native Salmonid Species	**Notes**
Winter steelhead, *Oncorhynchus mykiss** Spring Chinook salmon, *Oncorhynchus tshawytscha** Cutthroat trout, *Oncorhynchus clarki clark* Mountain whitefish*, Prosopium williamsoni*	Willamette spring Chinook and winter steelhead (both anadromous species) were listed as threatened under the federal Endangered Species Act (ESA) in 1999 and were removed from the list in 2014. Factors contributing to their decline include habitat loss, altered flow regimes, and proliferation of non-native species.
Native Non-salmonid Species	
Lamprey Pacific lamprey, *Lampetra tridentate** Other species	Pacific lamprey are anadromous (adults reside in the ocean and return to rivers and streams to spawn) and brook lamprey are resident species. Pacific lamprey was listed as an Oregon state sensitive species in 1993 due to a serious decline in abundance.
Minnows Speckled dace, *Rhinichthys osculus* Longnose dace, *Rhinichthys cataractae* Northern pikeminnow, *Ptycheilus oregonensis* Redside shiner, *Richardsonius balteatus* Chiselmouth, *Acrocheilus alutaceus* Peamouth, *Mylocheilus caurinus* Oregon chub, *Oregonichys crameri**	Dace occur throughout the watershed, primarily in the Calapooia River and the lower portions of tributaries. *Oregon chub* is a small minnow native to the Willamette River basin. Oregon chub were listed as endangered under the Federal ESA. Chub prefer low gradient tributaries and off-channel habitats such as side-channels and sloughs. Their decline has been attributed to loss of habitats, altered flow regimes, and predation.
Suckers Largescale sucker, *Catostomus macrocheilus* Mountain sucker*, Catostomus platyrhynchus*	
Sculpins Mottled sculpin, *Cottus baurdi* Paiute sculpin, *Cottus beldingi* Prickley sculpin, *Cottus asper* Shorthead sculpin, *Cottus confusus* Reticulate sculpin, *Cottus perplexus* Torrent sculpin, *Cottus rhotheus*	Sculpins occupy streams throughout the watershed, with the greatest abundance in the upper Calapooia River and tributaries.
Sticklebacks Three-spine stickleback, *Gastrosteus aculeatus*	
Troutperch Sand roller, *Percopsis transmontana*	Sand rollers are rare and endemic to the lower Columbia River drainage, including the Willamette River and its tributaries.
Non-Native Species (all non-salmonid)	
Largemouth bass, *Micropterus salmoides* Smallmouth bass, *Micropterus dolomieui* Yellow bullhead, *Ameiurus natalis* Bluegill, *Lepomis macrochirus* Pumpkinseed, *Lepomis gibbosus* Crappie (black), *Pomoxis nigromaculatus* Common carp, *Cyprinus carpio* Brown bullhead, *Ameiurus melas* Western mosquito fish, *Gambusia affinis* Goldfish*, Carassius auratus*	Non-native species prey on or compete with native species for food and habitat space. Non-natives typically proliferate in warm water and disturbed habitats.
*Species of Concern in the Willamette River Watershed	

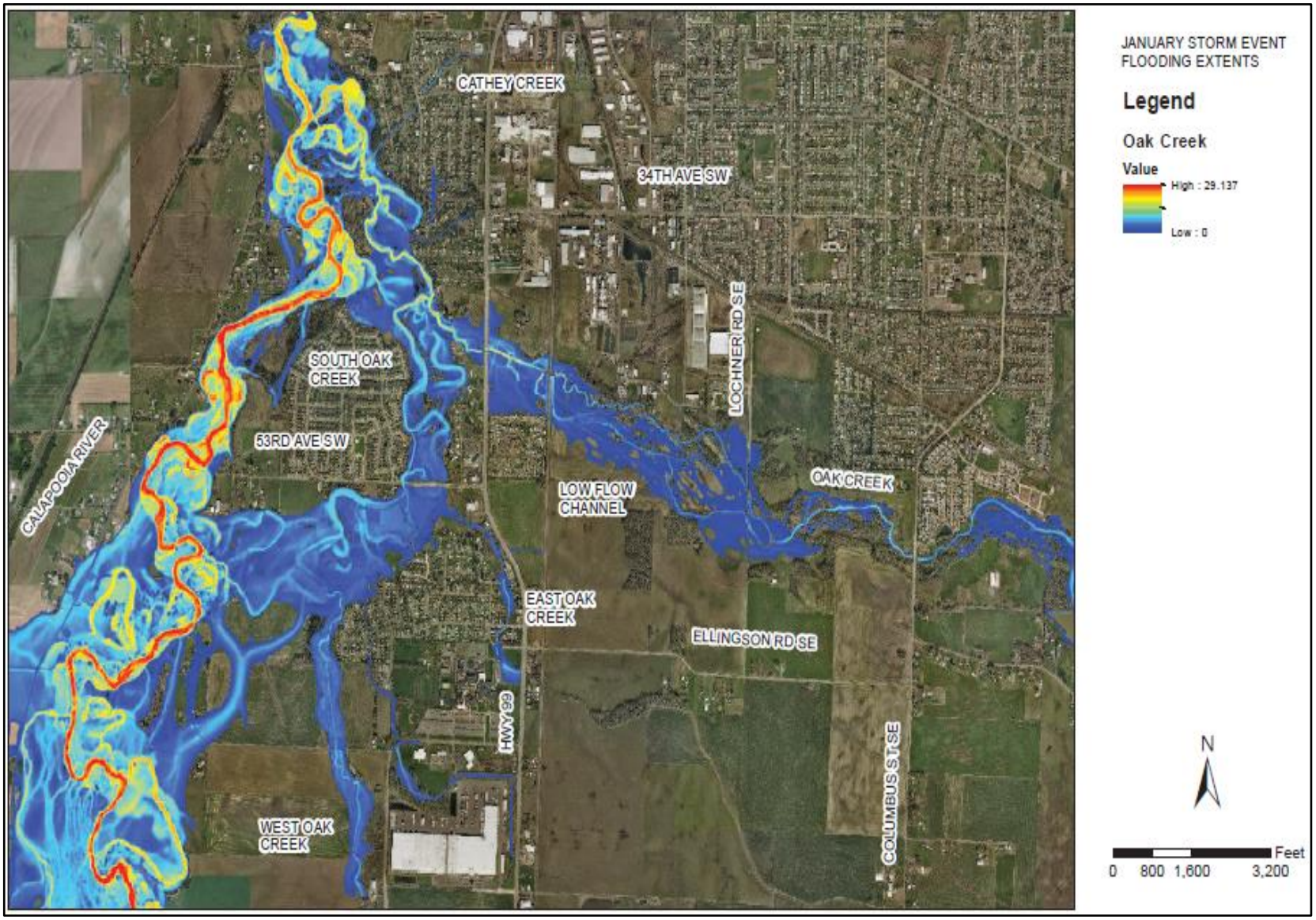

Figure A-3: 1D/2D Mapping Of Calapooia River and Oak Creek, Cardno, Entrix, January, 2012

Table A-4: Management Strategies for addressing nonpoint source parameters in the Calapooia River*		
Temperature	Maximize tree shade on urban streams	
		Focus efforts on city-owned riparian areas, demonstration projects, and tree giveaway programs
		Educate private land owners as opportunities arise
		Monitor short-term plant survival (at 2-3 years after planting) on city-owned riparian area
		Develop a long-term reassessment plan to measure changes in % effective shade
Bacteria	Address failing private septic systems within city limits	
		Continue connection requirement for failing systems
		Solicit input from Counties on known failure and risk areas
		Expand septic survey and update GIS layer
	Educate homeowners about septic system maintenance and how to detect failures	
		Print and distribute information to property owners & at events
	Prevent pet waste from reaching waterways	
		Install additional dog waste stations as opportunities arise
Bacteria and Mercury	Public education and outreach on stormwater impacts	
		Continue public education events such as semi-annual river cleanup or planting events
		Provide stormwater educational programs in local schools
	Public involvement/participation	
		Continue complying with state and local public notice requirements
	Illicit Discharge Detection and Elimination (IDDE)	
		Continue responding to public complaints regarding IDDE
		Maintain GIS stormwater attributes
		Provide education/outreach on IDDE
	Construction site stormwater runoff control	
		Assess and improve BMP requirements as necessary
	Post-construction stormwater management from new development and redevelopment	
		Revise ordinance to include post-construction requirements and enforcement
		Develop and implement structural and non-structural BMP requirements
		Ensure long-term maintenance and operation of BMPs
		Ensure adequate enforcement of the ordinance
	Pollution prevention/good housekeeping for municipal operations	
		Maintain hazardous storage and management in compliance with RCRA, DEQ regulations
		Correct deficiencies or establish correction timelines for municipal facility inspection results
		Provide training for City staff with potential SW impacts
		Stormwater system cleaning and maintenance activities
		Protect City-owned riparian areas against bank erosion, stormwater sheet flow
Temperature, Mercury and Bacteria	Educate the public on water quality	
		Provide informational material to adults/youth
* Adapted from the City of Albany Willamette Basin TMDL Implementation Plan Management Strategy Matrix, June 30, 2013		

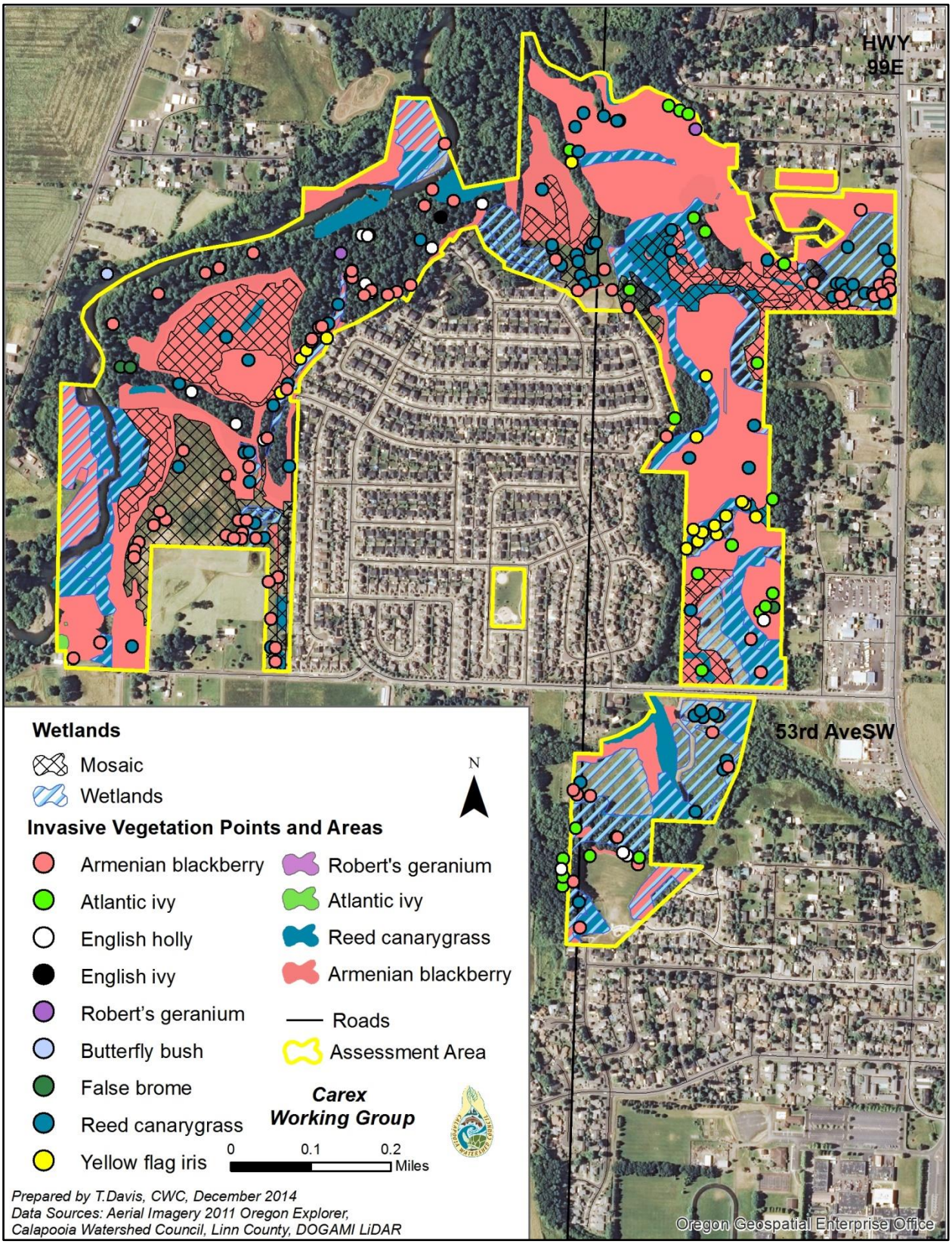

Figure A-4: Invasive vegetation points and areas

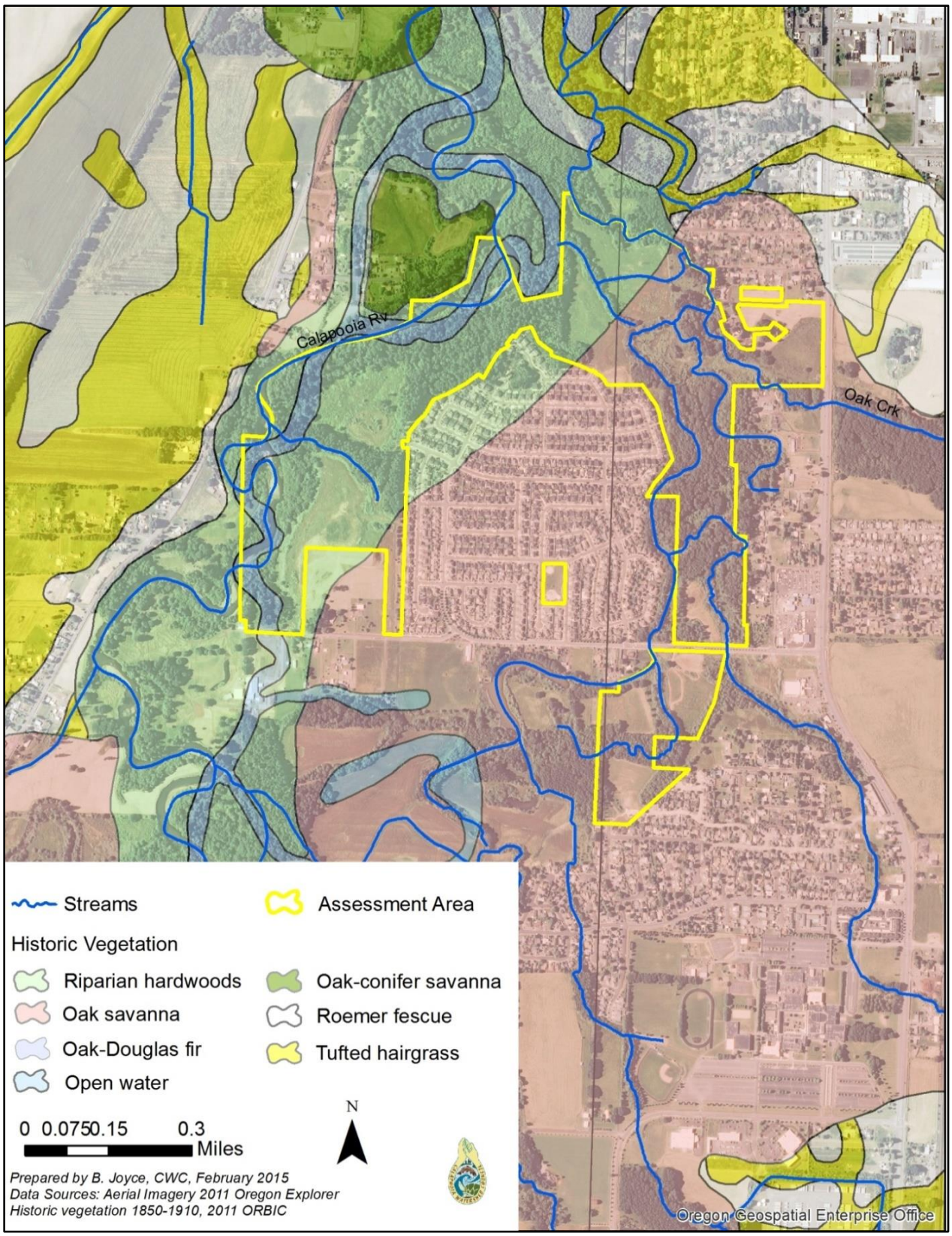

Figure A-5: Historical vegetation

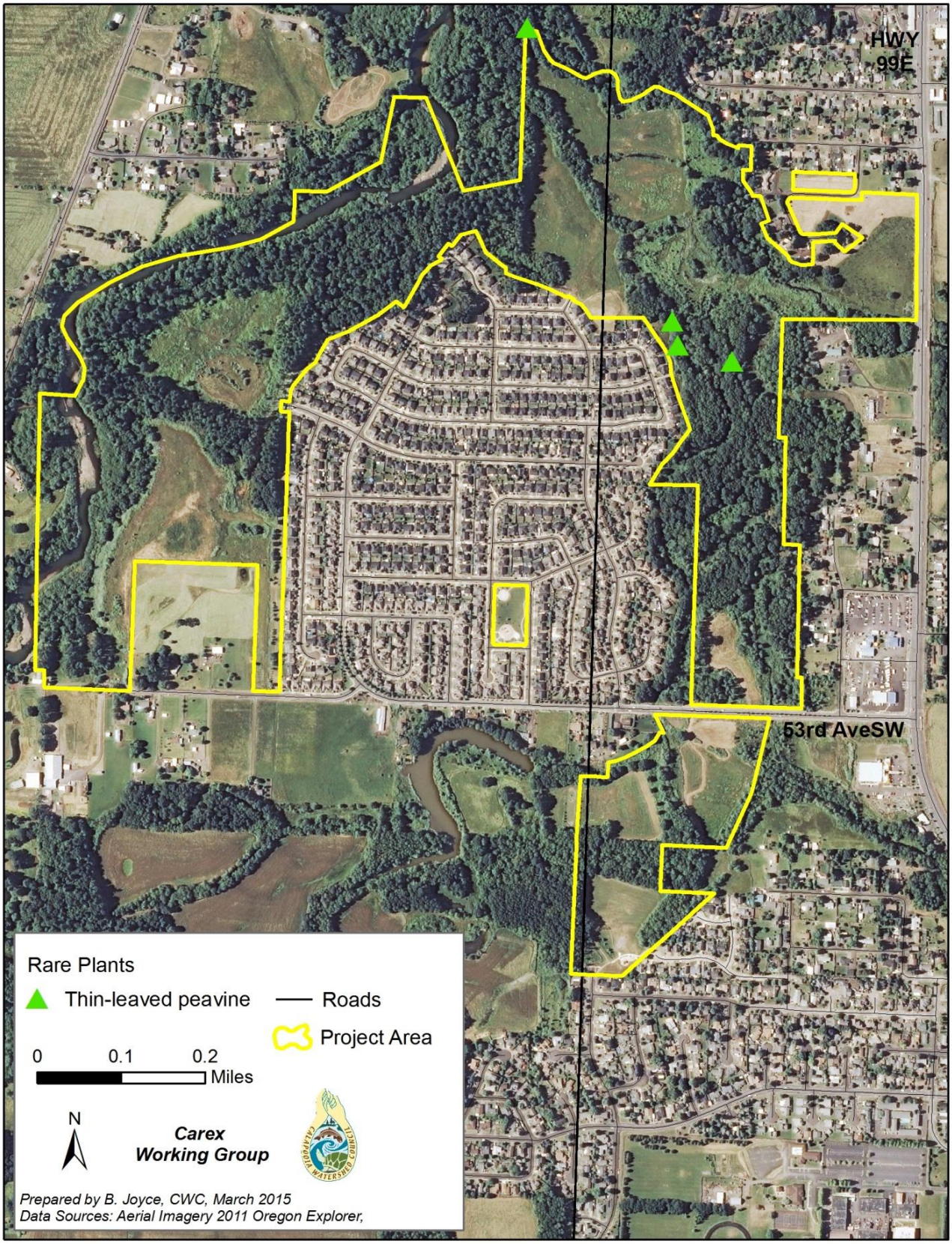

Figure A-6: Rare plant locations

Table A-5: Rare plant population data
Lathyrus holochlorus – subpopulation #1 Date: 4 June 2015 UTM: 10 490521E 4938928N +/- 15 feet Map datum = WGS84 Elevation = 205 feet 4 stems, 0 in flower Located along west edge of Oak Creek Trail near the northeast side of the housing development, approximately 250 feet east-northeast of Salmon Run SW. Habitat: Oak-ash forest edge with shrubby understory. Associated species: *Symphoricarpos albus, Toxicodendron diversilobum, Rubus bifrons, Rubus ursinus, Camassia quamash, Heracleum maximum.*
Lathyrus holochlorus – subpopulation #2 Date: 4 June 2015 UTM: 10 490637E 4938854N +/- 15 feet Map datum = WGS84 Elevation = 205 feet 4 stems, 1 in flower Located along east side of Oak Creek Trail in shrubs between the trail and slough; near the northeast side of the housing development, approximately 200 feet east of the intersection of Salmon Run SW; approximately 150 feet south of subpopulation #1. Habitat: Edge of open oak forest with shrubby understory. Associated species: *Symphoricarpos albus, Corylus cornuta* ssp. *californica, Oemleria cerasiformis, Rubus ursinus.*
Lathyrus holochlorus – subpopulation #3 Date: 25 June 2015 UTM: 10 490533E 4938882N +/- 10 feet Map datum = WGS84 Elevation = 210 feet 8 stems, 2 in flower Located along east side of Oak Creek Trail in shrubs between the trail and large slough near the eastern edge of the site; approximately 500 feet east of the intersection of Salmon Run and Bobcat Ave SW; approximately 350 feet southeast of subpopulation #2. Habitat: Edge of oak forest with shrubby understory. Associated species: *Symphoricarpos albus, Oemleria cerasiformis, Rubus ursinus, Toxicodendron diversilobum.*
Lathyrus holochlorus – subpopulation #4 Date: 30 June 2015 UTM: 10 490226E 4939490N +/- 10 feet Map datum = WGS84 Elevation = 210 feet 4 stems, all in fruit Located near northern tip of site along west side of roadbed that goes north to the neighboring property; just south of metal gate; approximately 0.33 mile north of Osprey Court SW. Habitat: Edge of oak-maple forest with shrubby understory. Associated species: *Symphoricarpos albus, Rubus parviflorus, Ligusticum apiifolium, Geranium robertianum.*

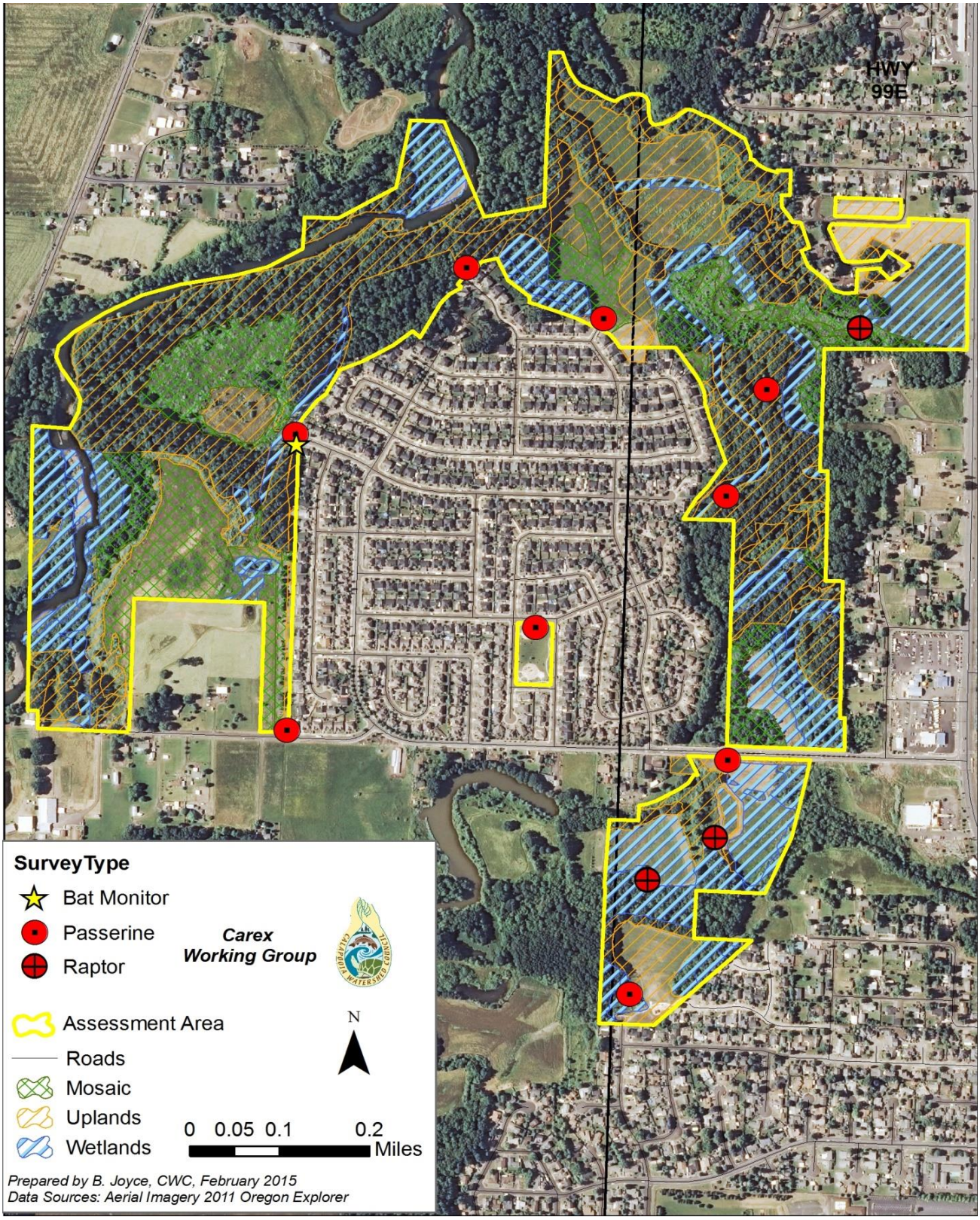

Figure A-7: Bird and bat survey locations

Table A-6: Avian species observed and associated habitat type													
	Grassland					Mixed woodland	Wet prairie		Woodland			Total	Birds per 10 minute survey
Species/Survey point	**1**	**4**	**7**	**8**	**9**	**2**	**11**	**12**	**3**	**5**	**6**	**--**	**--**
Acorn Woodpecker					1	3			1			5	0.63
American Goldfinch	5	3	5	5	5		2		1			26	3.25
American Robin	3	2	2	2	3	2		4	2	6	6	32	4.00
Anna's Hummingbird	2								1	1		4	0.50
Bald Eagle						2						2	0.25
Barn Swallow	1											1	0.13
Black and White Warbler								1				1	0.13
Black-capped Chickadee		1			1				1	2	1	6	0.75
Black-headed Grosbeak					1		1				2	4	0.50
Brewer's Blackbird	5						1					6	0.75
Brown-headed Cowbird						1						1	0.13
Cedar Waxwing							2	2				4	0.50
Cliff Swallow					2							2	0.25
Collared Dove	2		2	1	1						2	8	1.00
Common Yellowthroat							1	1				2	0.25
Downy Woodpecker										1		1	0.13
Eurasian Starling		3	16	5		5						29	3.63
Golden-crowned Kinglet	2				2					1		5	0.63
House Sparrow	3		7			2				5		17	2.13
Mallard	1											1	0.13
Northern Flicker	1					1			2	2		6	0.75
Olive-sided Flycatcher	4					2	1		4	1		12	1.50
Orange-crowned Warbler							1					1	0.13
Red-tailed hawk				1							1	2	0.25
Lesser Goldfinch	2											2	0.25
Scrub Jay		1				1	2	2			2	8	1.00
Song Sparrow		1		2		1	2	1	1			8	1.00
Spotted Towhee		2		3	3		3		5	6	3	25	3.13
Stellar's Jay						1						1	0.13
Tree Swallow		3				3			4	2		12	1.50
Turkey Vulture						1					1	2	0.25
Unknown Sparrow		1										1	0.13
Unknown Vireo									1			1	0.13
Unknown Woodpecker									1			1	0.13
Varied Thrush											1	1	0.13
Violet-green Swallow			1					2				3	0.38
Western Bluebird		3										3	0.38
White-breasted Nuthatch											1	1	0.13
White-crowned Sparrow			3									3	0.38
Wrentit									3			3	0.38
Yellow-rumped Warbler					1							1	0.13
Total	3	2	36	1	2	25	16	13	27	27	20	254	31.75

Table A-7: Bat species observed and potentially using Oak Creek Open Space			
Scientific name	**Common name**	**Observed**	**Willamette Valley**
Antrozous pallidus	pallid bat	No	Likely, but unlikely to be heard[1,3]
Corynorhinus townsendii	Townsend's big-eared bat	No	Possible, but unlikely to heard [2,3]
Eptesicus fuscus	big brown bat	Yes	Common [1.3]
Lasiurus blossevillii	western red bat	Yes	Possible, but uncommon [1,3]
Lasiurus cinereus	hoary bat	Yes	Common migrant [1,3]
Lasionycteris noctivagans	silver-haired bat	Yes	Common migrant [1,3]
Myotis californicus	California myotis	Yes	Possible [3]
Myotis evotis	long-eared myotis	Yes	Very possible, but quiet calls [3]
Myotis lucifugus	little brown myotis	Yes	Common [3]
Myotis thysanodes	fringed myotis	No	Unlikely due to habitat [1]
Myotis volans	long-legged myotis	No	Possible [3]
Myotis yumanensis	Yuma myotis	Yes	Likely [3]
([1]) Barbour and Davis 1969. ([2]) BCI 2012, ([3]) Oregon Department of Fish and Wildlife 2012.			

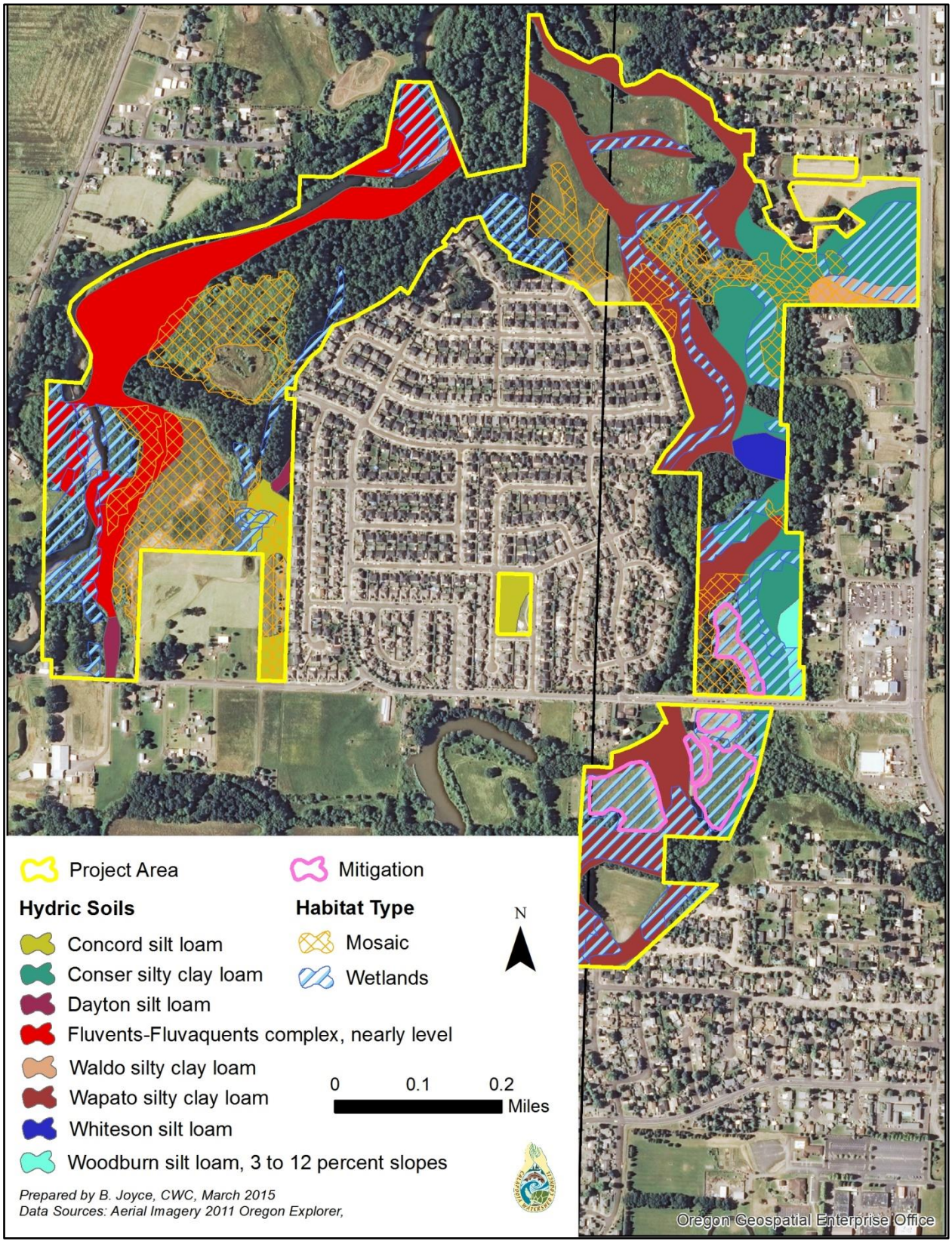

Figure A-8: Wetlands and hydric soils

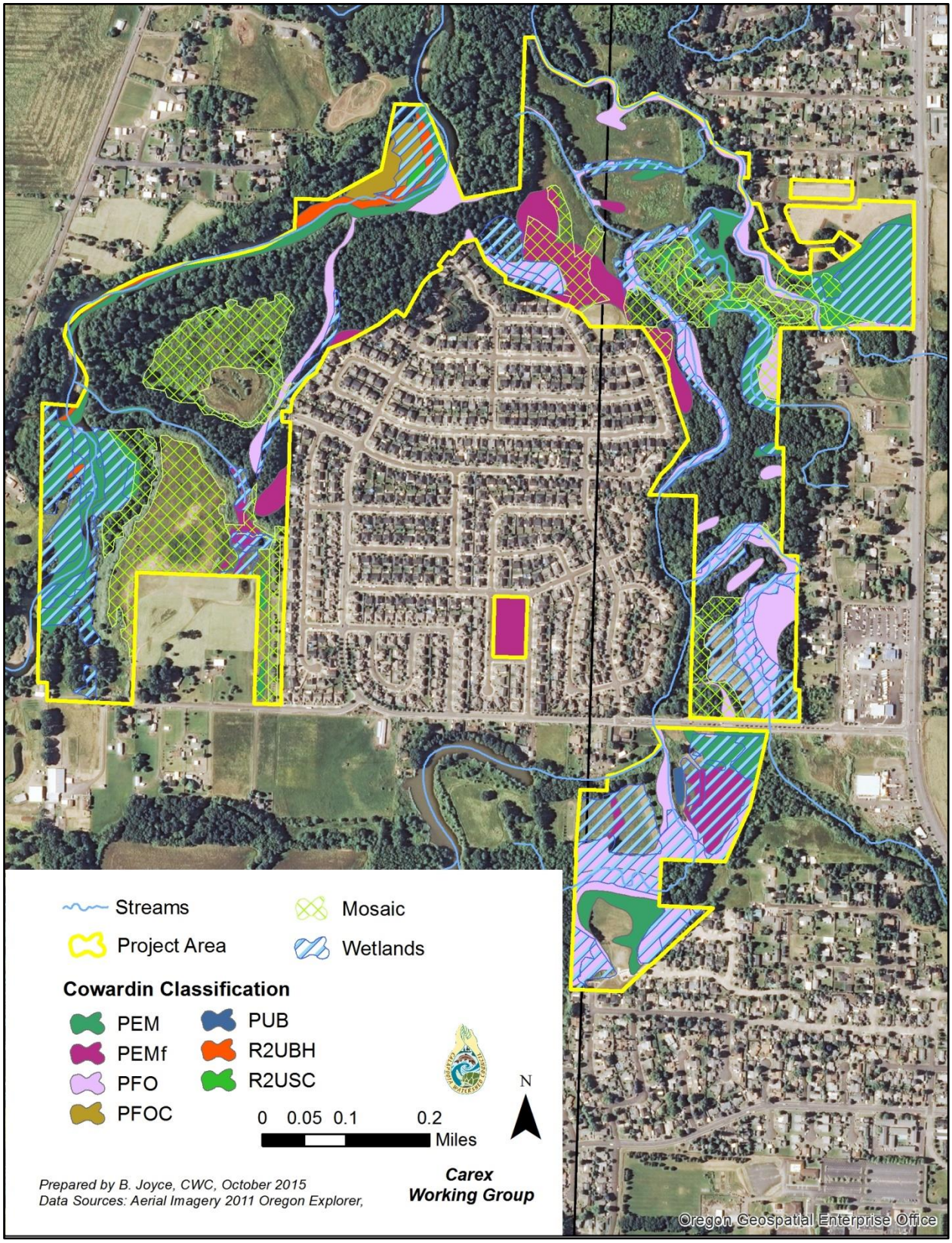

Figure A-9: Cowardin wetland classifications and surveyed wetlands

Table A-8: Wetland function definitions
Water Storage & Delay (WS): The effectiveness for storing of delaying surface water for long or short periods.
Sediment Retention & Stabilization (SR): The effectiveness for intercepting and filtering suspended inorganic sediments thus allowing their deposition, as well as reducing energy of waves and currents, resisting erosion, and stabilizing underlying sediments or soil.
Phosphorus Retention (PR): The effectiveness for retaining phosphorus for long periods (>1 growing season) as a result of chemical adsorption, or from translocation by plants to belowground zones with less potential for physically or chemically remobilizing phosphorus into the water column.
Nitrate Removal & Retention (NR): The effectiveness for retaining particulate nitrate and converting soluble nitrate and ammonia to nitrogen gas, primarily through the microbial process of denitrification, while generating little or no nitrous oxide (a potent "greenhouse gas").
Thermoregulation (T): The effectiveness for maintaining or reducing summertime water temperature, and in some cases, for moderating winter water temperature.
Carbon Sequestration (CS): The effectiveness for retaining both incoming particulate and dissolved carbon, and through the photosynthetic process converting carbon dioxide gas to organic matter (particulate or dissolved), and then retaining that organic matter on a net annual basis for long periods while emitting little or no methane (a potent "greenhouse gas").
Organic Matter Export (OE): The effectiveness for producing and subsequently exporting organic matter, either particulate or dissolved.
Aquatic Invertebrate Habitat (INV): The capacity to support an abundance and diversity of marine and freshwater invertebrate animals which spend all or part of their life cycle underwater or in moist soil. Includes dragonflies, midges, crabs, clams, snails, water beetles, shrimp, aquatic worms, and others.
Anadromous Fish Habitat (FA): The capacity to support an abundance of native anadromous fish (chiefly salmonids) for functions other than spawning.
Non-anadromous Fish Habitat (FR): The capacity to support an abundance and diversity of native non-anadromous fish (both resident and visiting species).
Amphibian & Reptile Habitat (AM): The capacity to support an abundance and diversity of native amphibians and native wetland-dependent reptiles.
Waterbird Feeding Habitat (WBF): The capacity to support an abundance and diversity of feeding waterbirds, primarily outside of the usual nesting season.
Waterbird Nesting Habitat (WBN): The capacity to support an abundance and diversity of nesting waterbirds.
Songbird, Raptor, & Mammal Habitat (SBM): The capacity to support an abundance and diversity of songbird, raptor, and mammal species and functional groups, especially those that are most dependent on wetlands or water.
Pollinator Habitat (POL): The capacity to support pollinating insects, such as bees, wasps, butterflies, moths, flies, and beetles.
Native Plant Diversity (PD): The capacity to support a diversity of native, hydrophytic, vascular plant species, communities, and functional groups, at either the site scale or through contribution to regional-scale native plant diversity.
Wetland Ecological Condition (CQ): Operationally, the integrity or health of the wetland as defined primarily by its vegetation composition. More broadly, the structure, composition, and function of an ecosystem as compared to reference ecosystems operating within the bounds of natural or historic disturbance regimes.
Wetland Stressors (STR): The degree to which the wetland is or has recently been altered by, or exposed to risk from, human and natural factors.
Wetland Sensitivity (SEN): the lack of intrinsic resistance and resilience of the wetland to human and natural stressors (higher score = more sensitive).

Table A-9: Components of grouped services	
Primary Grouped Services	**Aggregated Functions Within Each Grouped Service**
Hydrologic	water storage & delay
Water Quality Support	sediment retention & stabilization phosphorus retention nitrate removal & retention thermoregulation
Fish Support	anadromous fish habitat non-anadromous fish habitat
Aquatic Support	aquatic invertebrate habitat amphibian & reptile habitat waterbird feeding habitat waterbird nesting habitat organic matter export
Terrestrial Support	songbird, raptor & mammal habitat native plant diversity pollinator habitat

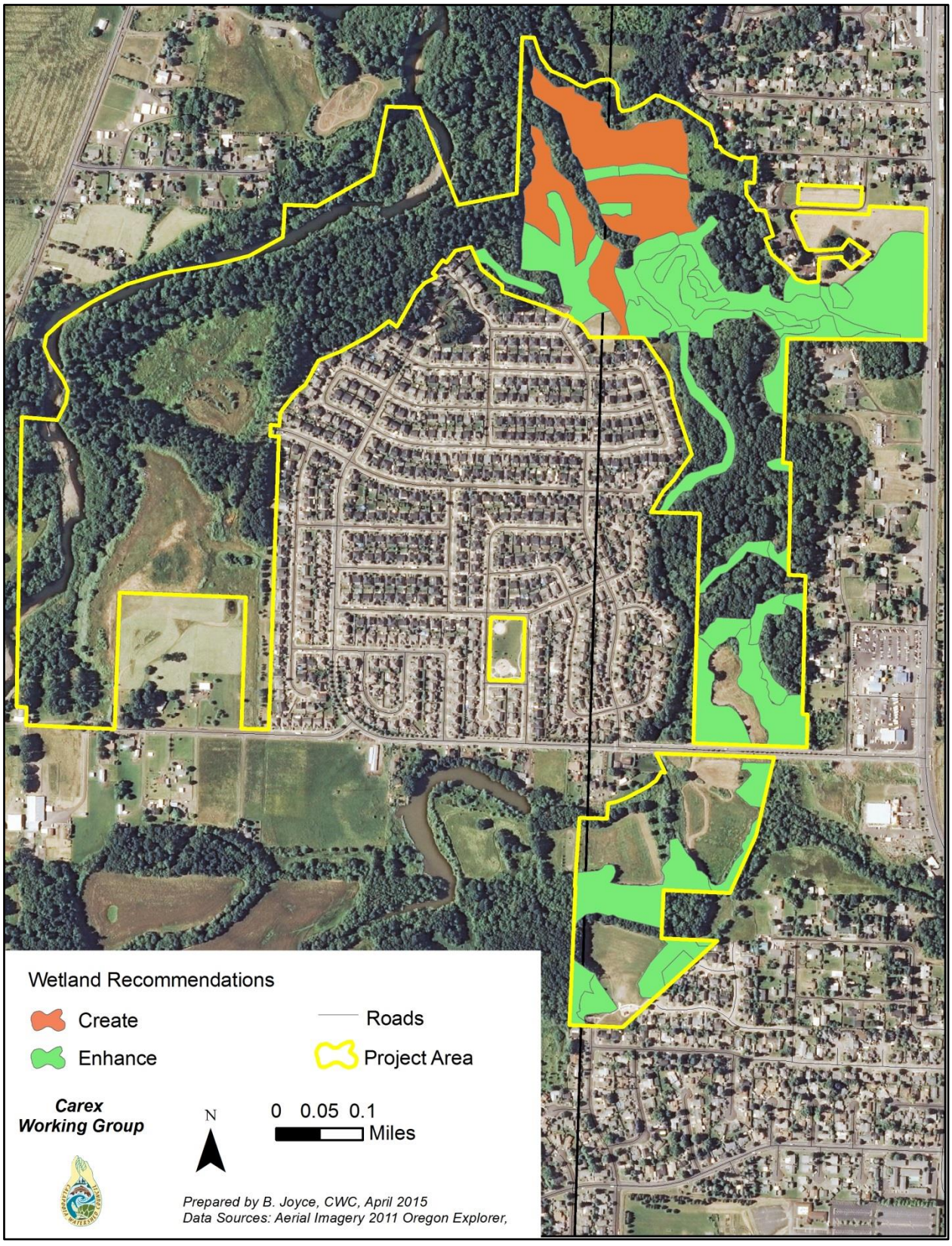

Figure A-10: Wetland creation and enhancement opportunities

Table A-10: Community comments

Input and comments received, regarding the Oak Creek Open Space, from 34 nearby residents during a community meeting in May, 2015.

Concerns

- Don't use because of questionable people
- Monitoring and enforcement would need to go with development
- Need more info about landfill – wells, water quality
- Excited, yet concerned about 'spillover' from public use
- Current uses (illegal) – do something
- Weeds migrating to adjacent land
- Other negative impacts include poor drainage from landfill / public property
- Ask for help from neighbors
- Use = parking, where?
- Trails blocked by floods
- Mallard ducks nesting on ground get disturbed by dogs, clutches lost
- Garbage – teenage hangout (not terrible)
    - Near bike jumps
    - Kids play airsoft, paintball
    - Kids make trails for bikes; tearing up vegetation, leave garbage, erosion
    - Paintball, airsoft
- Long-term:
    - Non defined open space
    - Safety concerns
        - Shooting? / 4 wheelers / motorcycles / BMX
- Restoration vs development

Management Suggestions

- Keep it neighborhood, not public recreation
- Just leave it natural – safe/secret
- No 'park-like' infrastructure
- Landfill – wild, dog park
- Year round trail running:
    - Raise wooden tracks, decking
    - Jackson Frasier wetland example
    - Cinder blocks
    - Trail construction volunteer – Loop
- Garbage cans on trail
- Maintain paths

- Beaver control – prevent water back-up, let tribs go dry to get rid of bull frogs
- Access to swimming hole needs invasives control
- Want to see trails
- Water sampling
- Aquatic habitat

Education Desired / Community Organizing

- "Friends of the Open Space"
    - There'd be interest
    - Theory around 'friends' groups
- Community event - annual event
    - Weed control
    - Poop control and bags, garbage can for poop disposal
- Community groups to pull weeds, also pick up trash
- Identify invasive species – books, brochures, etc.
- Survey birds, wildlife, etc, fish, organized survey sheet to maintain year round
- Cook-off w/invasive species
    - Blackberry
    - Frogs legs
    - Nutria
- Nature center – information kiosk
- Cat owner responsibility
- Need more effective communication w/neighbors
- More info about nature, plants, animals
- Post-signs for meetings
- Community wants to give Input/ know land use
- Community wants to understand effects of changes / be at table
- Better information
- Signs (may help deter negative activity and build pride)
    - Explaining natural area
    - Interpretive
- Post card with link to education materials on webpage
- Facebook page (facebook page for Spring Meadow and Brookfield HOA areas combined is active and used)
- Annual weed pull
- School groups, tours

Current Values and Uses

- Neighborhood likes that it's not a through street
- Natural place, great
- Hawk, deer groups, bald eagle
- White rabbit
- Rumors of homeless, but not major problem
- People feel safe
- Quiet
- Pretty – trees / view
- Open, undeveloped / wildlife
- Soft paths
- Nearby walking
- Convenient, easy to get to
- Animal / Dog-friendly
- Nature study and observation with kids
- Seasons
- Bird watching
- Walk/run trail (seasonal, but even a lot of daily users)
- Trail
- Wildlife
- Creek
- Deer
- Privacy of back yard / wetlands behind
- Lack of development
- Invasive species
- Hiking / running often
- No backyard neighbors
- Path to walk on and walk dogs
- Wildlife, birds
- Natural setting
- Close to town but feeling a little 'country'
- Close to Calapooia swimming hole
- Picking blackberries
- Look for wildflowers
- Hangout to swim – secret swim spot
- Peaceful, no aggressive behavior
- Walking
- Dog walk
- Ave use once per week with family and dog
- Walk 5 times per week
- Nice to have multiple access points
- Photography, art, senior pictures
- Species identification practice
- Swimming