



**Burnt Bridge Creek
Operations & Maintenance
Workgroup Meeting**



DEPARTMENT OF
ECOLOGY
State of Washington
SOUTHWEST REGION OFFICE

Welcomes & Introductions

- *Name, Title, Department*



Meeting Objectives

- 1. Review priority locations for water quality improvement from Source Assessment (15 minutes)**
- 2. Begin implementation planning (60 minutes)**
 - Priority areas for implementation.
 - Implementation goals, actions, and opportunities.
 - Implementation challenges.
 - Milestones, targets, and timelines for implementation.
 - Criteria to measure progress (performance measures).
 - Funding sources and implementation partners.
- 3. Next steps (10 minutes)**

Where have we been?

- **October 2020:** Burnt Bridge Creek Source Assessment published
- **February 2021:** Burnt Bridge Creek Partnership kicked off
- **March 2021:** Implementation workgroups assigned
 - Stormwater and capital improvements
 - Operations and maintenance
 - Urban forestry and greenways
 - Sewer connection and septic systems
 - Public education and outreach
 - Other TBD: SEH America, local water use, and monitoring
- **April-May 2021:** Implementation Workgroups
 - *Ecology having internal meeting about SEH America Facility*

Where are we going?

- **June 2021:** Submit completed worksheets to Ecology
- **Summer 2021:** Full Burnt Bridge Creek Partnership meeting
Report out on what we learned at workgroups
- **Summer 2021:** External partnership meeting – LCEP, Watershed Alliance, WSDOT, Clark County Clean water Division, Clark County Public Health, Clark Conservation District, LCFRB, etc.
- **Fall 2021:** Public Webinar
- **January 2022:** Internal Draft (City of Vancouver, Ecology, and EPA)
- **Spring 2022:** External Draft Burnt Bridge Creek Water Cleanup Plan
- **Summer 2022:** Publish *Burnt Bridge Creek Water Cleanup Plan*

Ecology's Objective

- **Lead City of Vancouver through a planning process that results in a Water Cleanup Plan that achieves EPA's requirements.**
 - Identify **causes of pollution.**
 - Estimate pollutant **reductions needed.**
 - Describe **implementation** to achieve pollutant reductions
 - Estimate **technical and financial assistance** needed
 - Develop information and **education** component
 - Develop **implementation schedule.**
 - Establish **milestones and targets**
 - Develop **criteria to measure progress**
 - Monitor to **evaluate effectiveness** of implementation efforts.

Water Quality Priorities



Burnt Bridge Creek Source Assessment

TMDL Study- *Source Assessment*

- Identify critical areas
- Identify shade deficits
- Bacteria load reductions needed
- Implementation recommendations



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State of Washington

Burnt Bridge Creek Watershed Fecal Coliform Bacteria, Temperature, Dissolved Oxygen, and pH

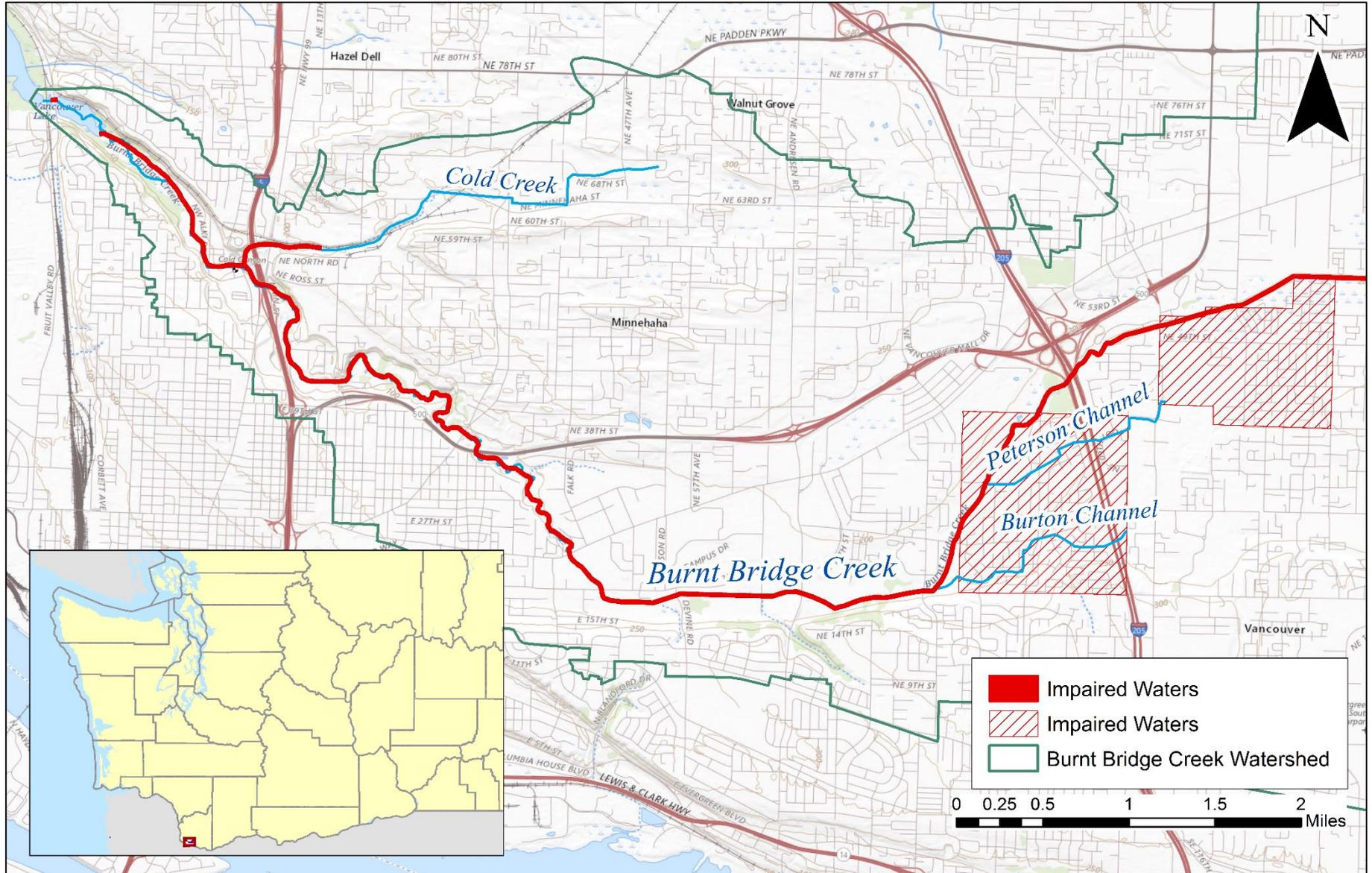
Source Assessment Report

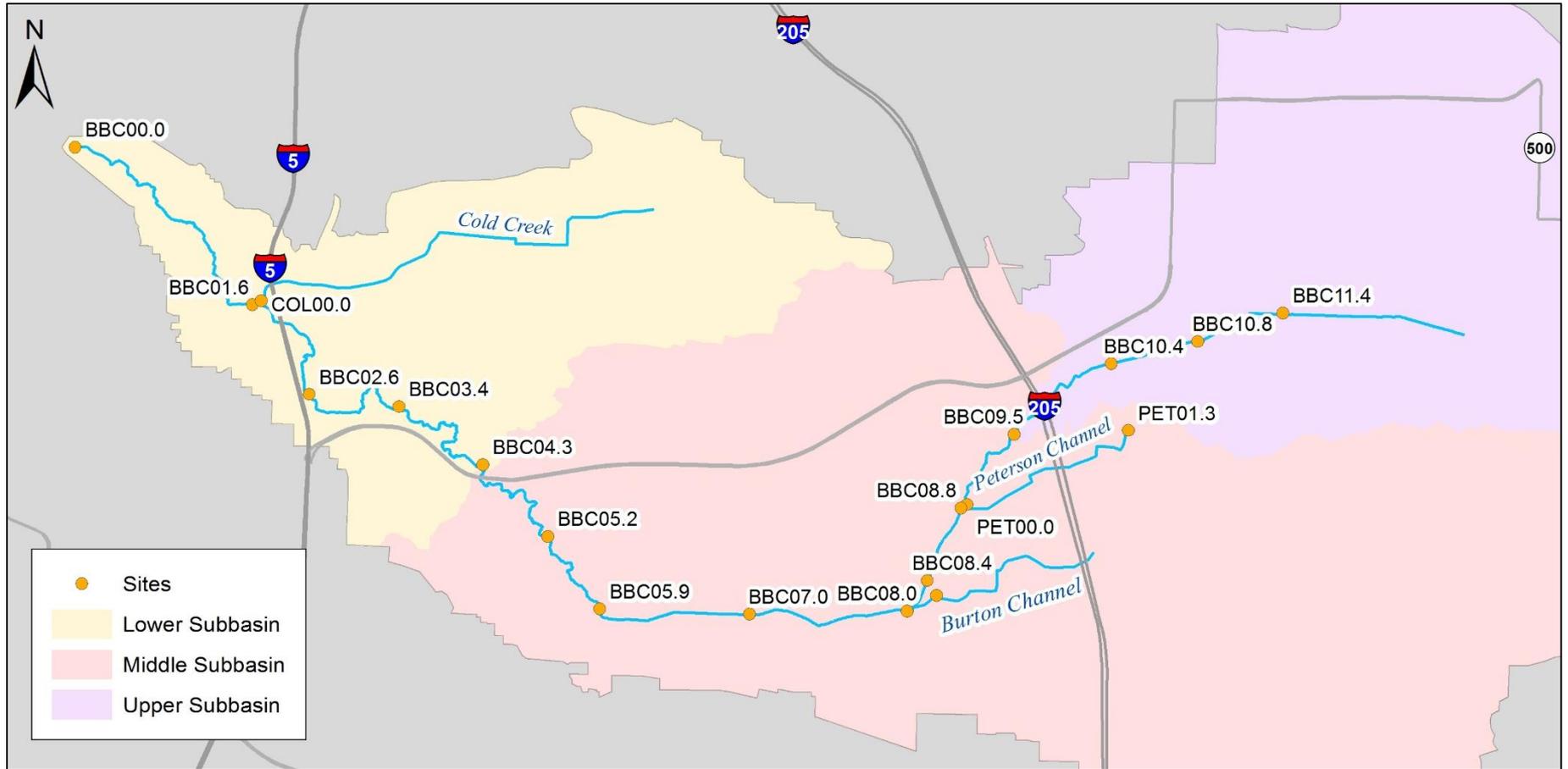


October 2020

Publication 20-03-016

303d list - Bacteria, Temperature, pH, and Dissolved Oxygen

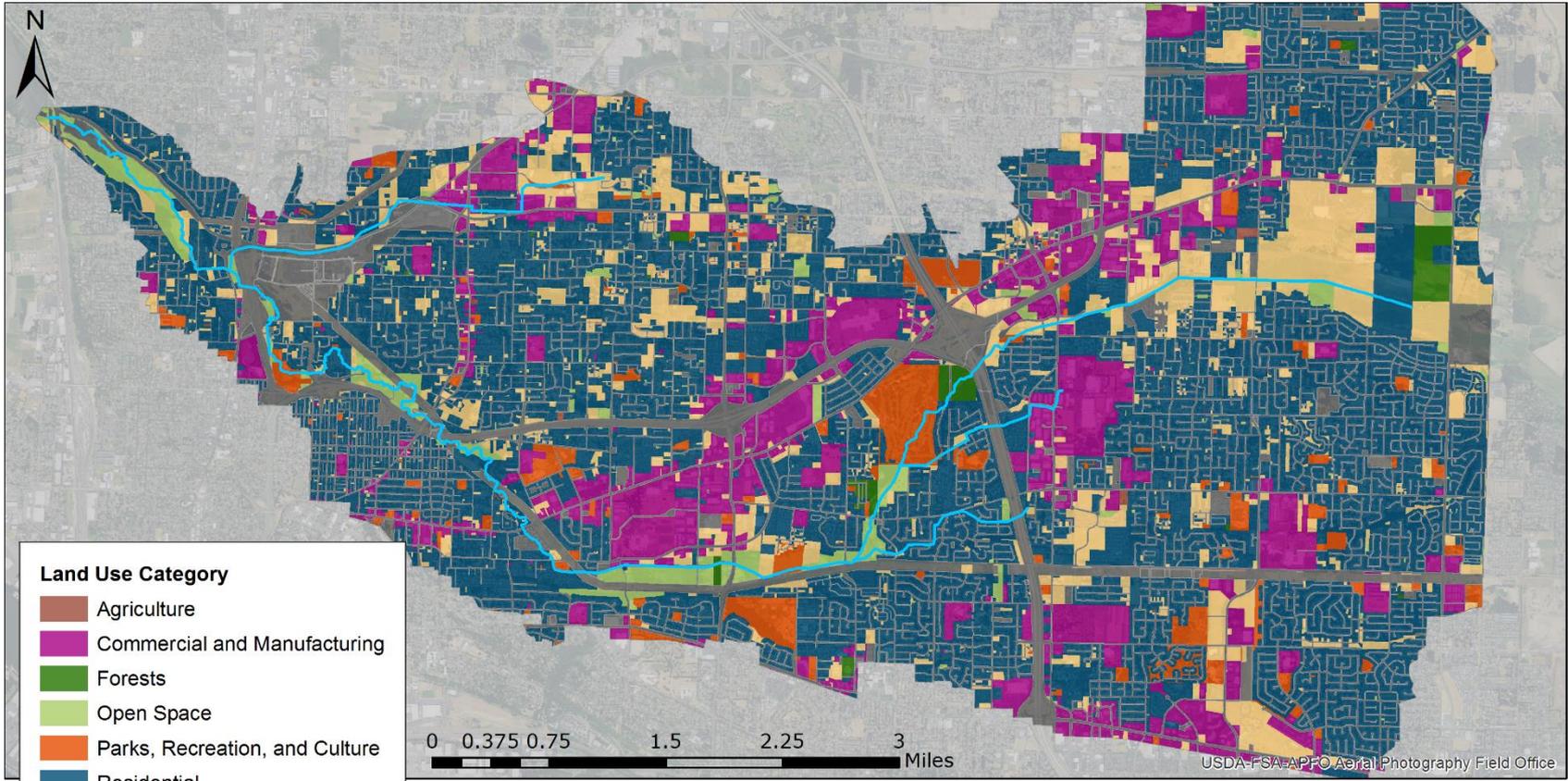


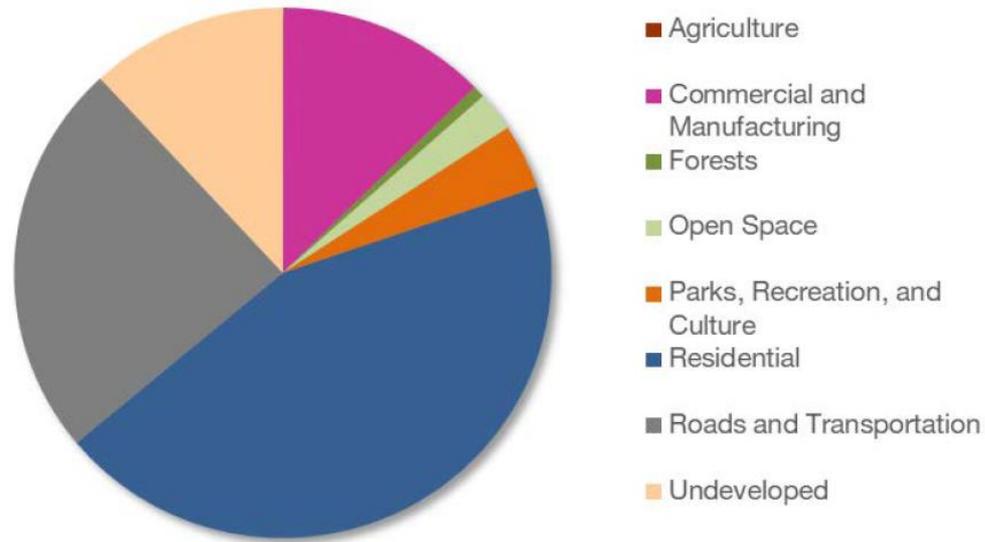


Lower = RM 0 to 5

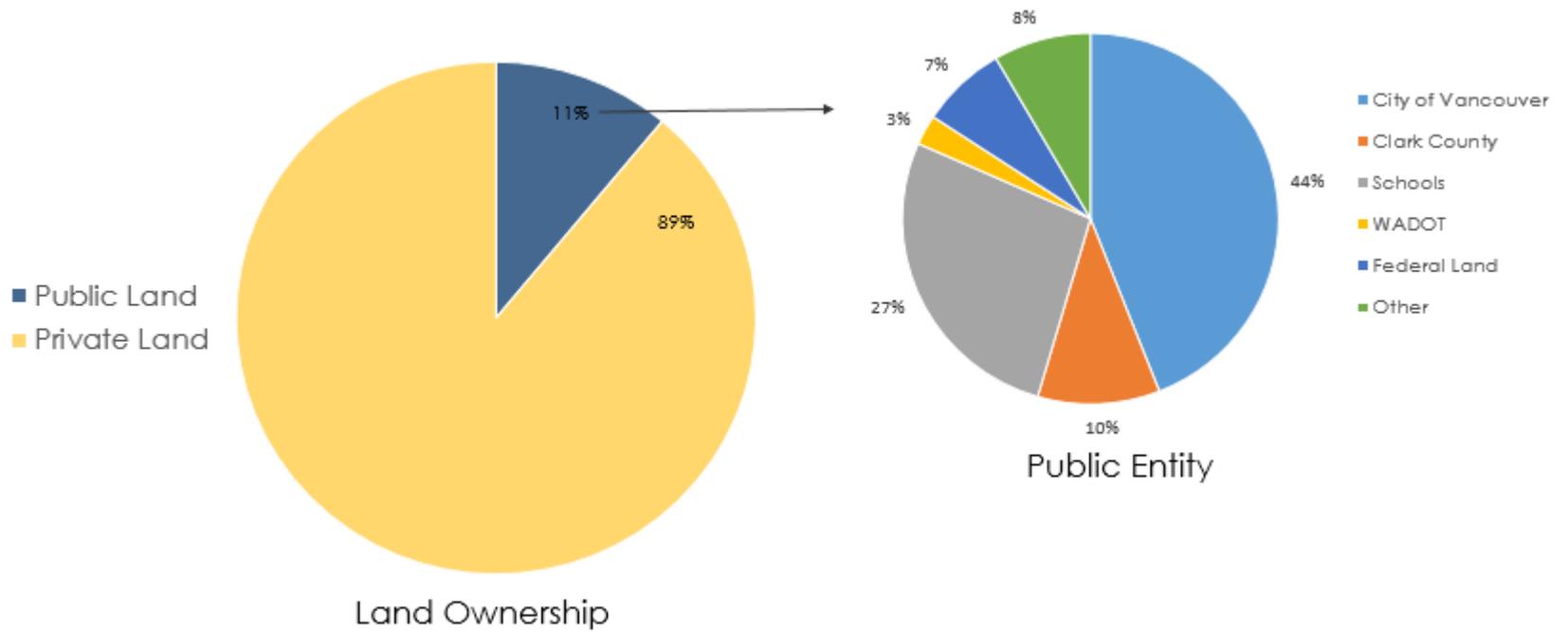
Middle = RM 5 to 10

Upper = RM 10 to 13



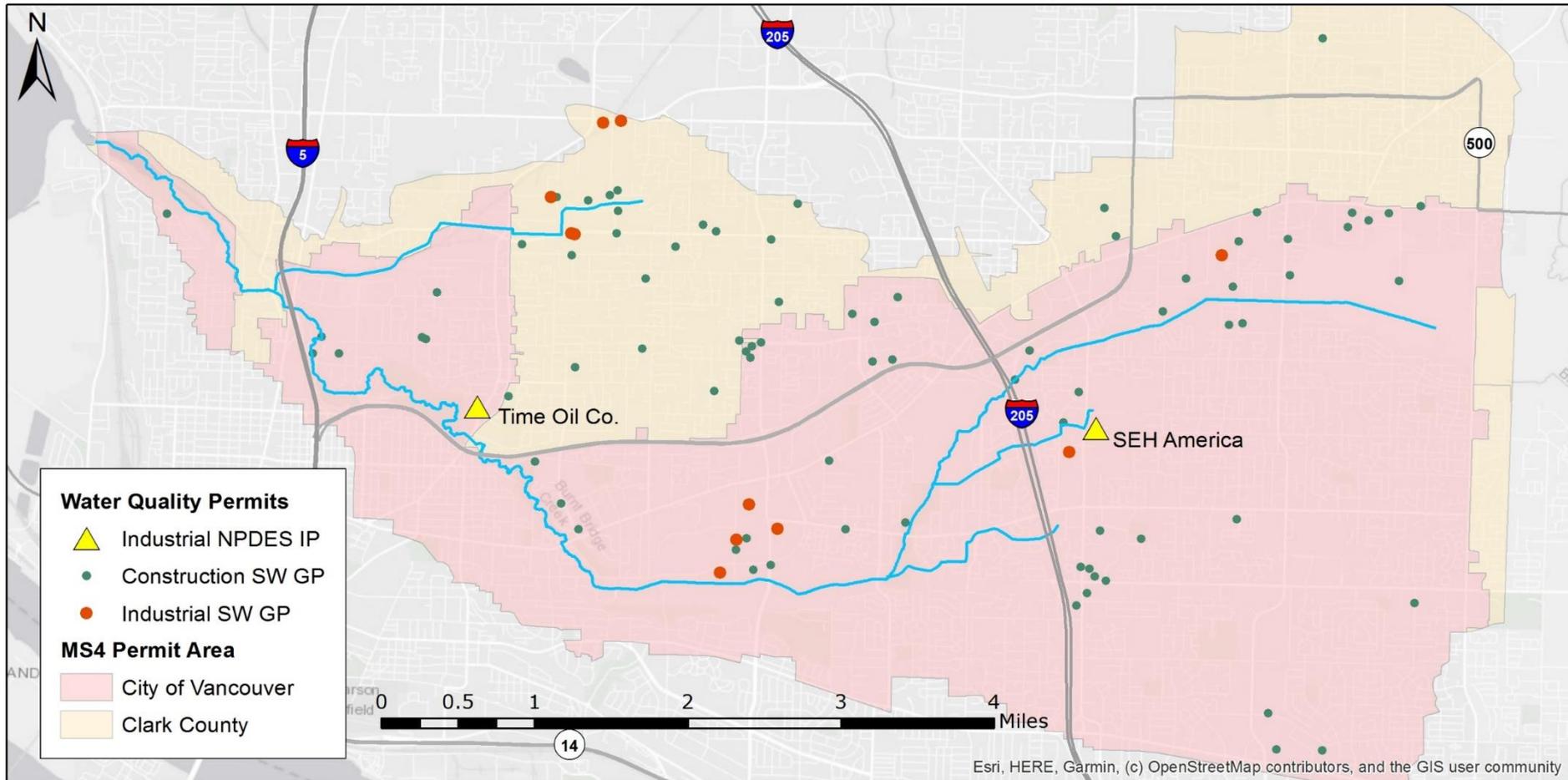


Land Use Category	Land Use (acre)	Land Use (%)
Agriculture	12	0%
Commercial and Manufacturing	2,333	13%
Forests	134	1%
Open Space	445	2%
Parks, Recreation, and Culture	736	4%
Residential	8,174	44%
Roads and Transportation	4,478	24%
Undeveloped	2,201	12%



Public Entity	Land Area (acre)	Land Area (%)
City of Vancouver	901	44%
Clark County	215	10%
Schools	554	27%
WSDOT	54	3%
Federal Land	151	7%
Other	171	8%

MS4 Area and NPDES Permits



~70% or 13,030 acres is covered by the City of Vancouver MS4 permit

Priority Areas

- **Lower watershed: RM 0-5**
 - 45% residential
 - 29% roads
 - 7% commercial, manufacturing, mining
 - Vancouver / Clark County MS4 and some WSDOT
- **Middle watershed: RM 5-10**
 - 45% residential
 - 24% roads
 - 15% commercial, manufacturing, mining
 - Mostly Vancouver MS4, some Clark County & WSDOT
- **Upper watershed: RM 10-13**
 - 43% residential
 - 21% roads
 - 11% commercial, manufacturing, mining
 - City of Vancouver and Clark County MS4

Permits

Table 7. List of permits in Burnt Bridge Creek watershed.

Permit ID	Permit Category	Permit
WAR301324	Construction SW GP	~90
WA0039616	Industrial NPDES IP	SEH America Inc
WA0040967	Industrial NPDES IP	Time Oil Co NE Cherry Dr
WAR005582	Industrial SW GP	Trus Way Inc
WAR305395	Industrial SW GP	Marks Design
CNE304850	Industrial SW GP	City Bark & Recycling LLC
CNE307641	Industrial SW GP	Hy Pro Corporation
CNE307654	Industrial SW GP	Templar Granite LLC
CNE307405	Industrial SW GP	Heuvel Enterprises
CNE126328	Industrial SW GP	Lynnwood Kitchens Inc
WAR001186	Industrial SW GP	Boc Process Gas Solutions
WAR305409	Industrial SW GP	Fabrication Products Inc Minnehaha St
WAR308058	Industrial SW GP	Accra Fab Inc Vancouver
CNE304852	Industrial SW GP	Dewils Industries

Construction, individual, and industrial stormwater permits.

Bacteria Priorities



Summary of Fecal Coliform Bacteria Results (2009-2010)

Comparison with Water Quality Criteria

Site	Dry Season Count (n)	Dry Season GeoMean	Dry Season %excd	Wet Season Count (n)	Wet Season GeoMean	Wet Season %excd
BBC11.4	15	63	0%	18	23	11%
BBC10.8	15	63	0%	18	24	11%
BBC10.4	15	130	27%	18	47	22%
BBC09.5	15	75	7%	18	36	22%
BBC08.8	15	76	7%	18	34	11%
PET01.3	14	9	7%	18	6	11%
PET00.0	15	310	87%	18	219	50%
BBC08.4	15	215	47%	18	90	17%
BUR00.0	15	260	40%	18	183	39%
BBC08.0	15	162	40%	18	107	22%
BBC07.0	14	98	21%	18	87	39%
BBC05.9	15	107	13%	18	74	28%
BBC05.2	15	132	20%	18	129	50%
BBC04.3	15	164	27%	18	122	39%
BBC03.4	15	138	20%	18	126	39%
BBC02.6	15	236	60%	18	118	39%
COL00.0	15	484	87%	18	150	44%
BBC01.6	15	215	60%	18	128	44%
BBC00.0	13	19	0%	17	49	24%

<u>Water Quality Standard</u>
Geometric Mean < 100 cfu/100 mL
10% not to exceed 200 cfu/100 mL

Priorities

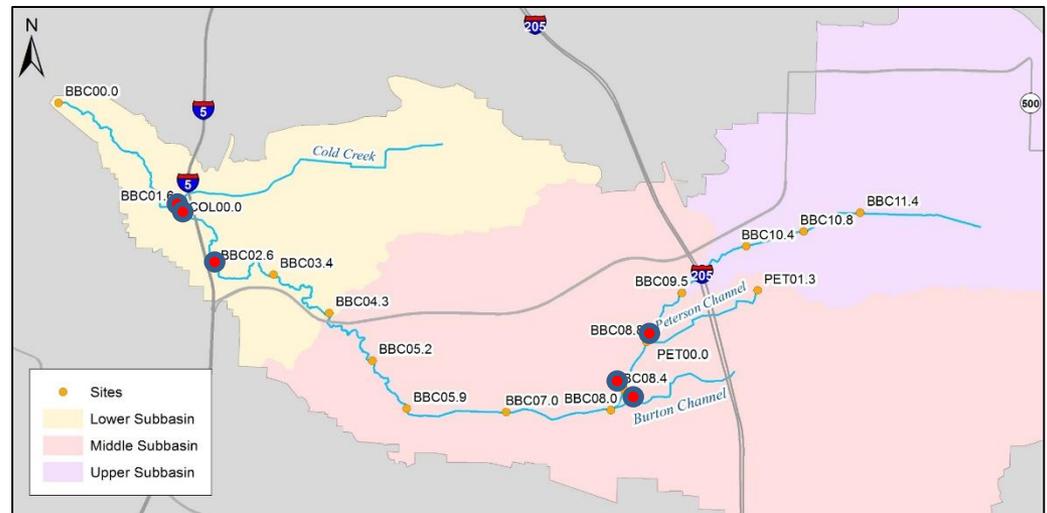
- Peterson
- Burton
- Cold Creek
- RM 1.6
- RM 2.6
- RM 8.4

- **Red** = Geometric Means over 200 cfu / 100 ml
- **Yellow** = Geometric Means over 100 cfu / 100 ml

Recommendations?

Focus bacteria reduction efforts to Middle & Lower watershed.

- **Priority 1: Geometric means >200cfu/100ml in dry season**
 - Peterson Channel
 - Burton Channel
 - Cold Creek
 - BBC 8.4
 - BBC 2.6
 - BBC 1.6



- Load reductions of over 75% are needed at all of these locations to meet water quality standards.

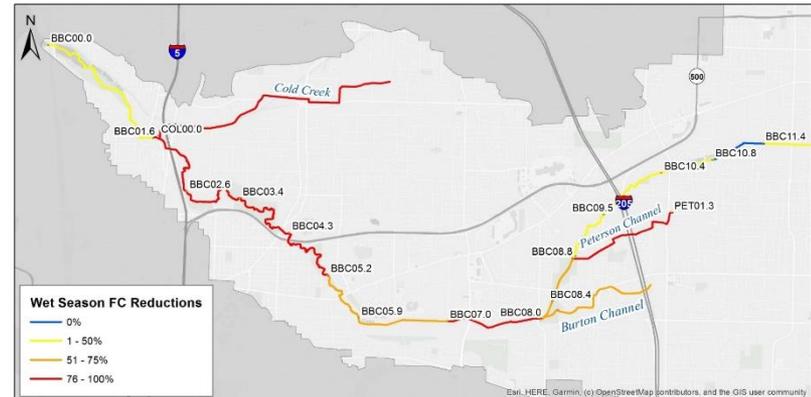
Recommendations?

Focus bacteria reduction efforts to Middle & Lower watershed.

Priority 2: >75% load reductions needed

- Peterson Channel – Wet and Dry season
- Burton Channel – Wet Season
- Cold Creek – Dry Season
- BBC 8.4 – Dry season
- BBC 7.0 – Wet Season
- BBC 4.3 – Wet Season
- BBC 3.4 – Wet Season
- BBC 2.6 – Wet Season
- BBC 1.6 – Wet Season

Red = Also a #1 priority due to geometric means over 200 cfu/100 ml in dry season



Recommendations?

- **Priority 3: Geometric means over 100 cfu/100ml**
 - BBC10.4
 - BBC 8.0
 - BBC 5.9
 - BBC 5.2
 - **BBC 3.4**

Red = Also a priority due to >75% load reductions needed in wet season

Summary

- **Priority Areas (#1 and #2)**
 - ***Tributaries:*** Peterson Channel, Cold Creek, Burton Channel, RM
 - ***Middle watershed***
 - BBC08.4 during the dry season
 - BBC07.0 during the wet season
 - ***Lower watershed***
 - BBC04.3, BBC03.4, BBC02.6, and BBC01.6 during the wet season.



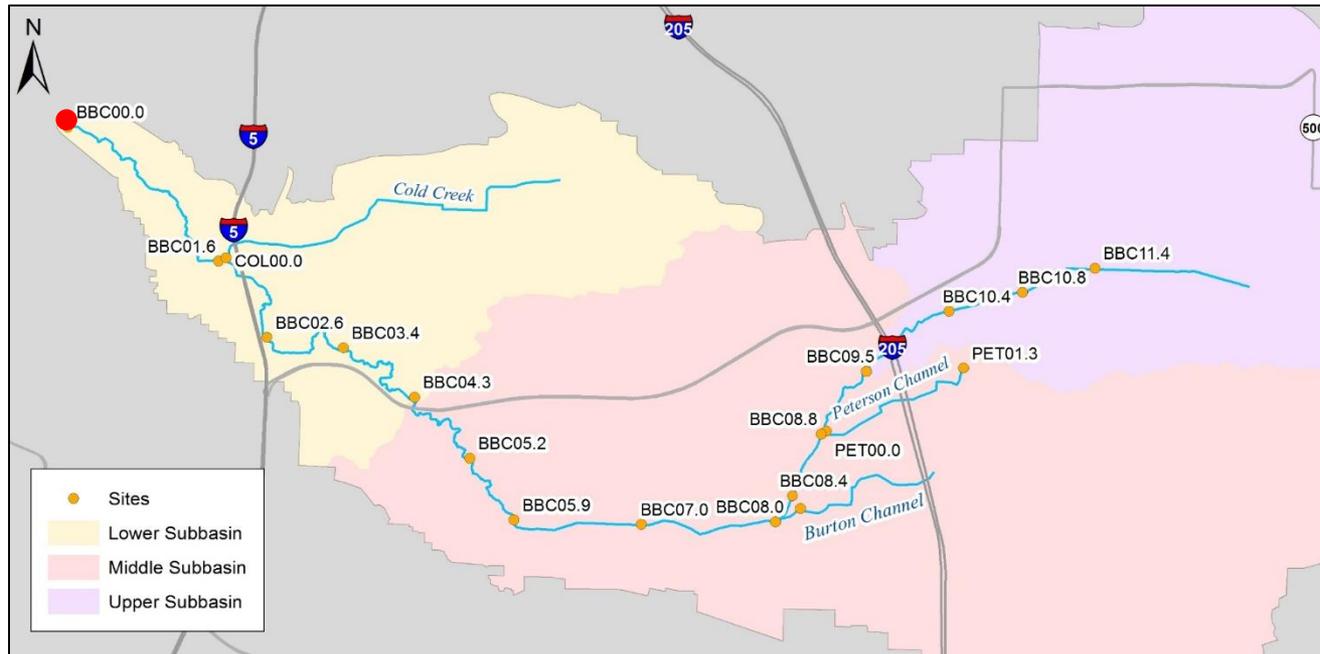
Dissolved Oxygen Priority Areas

- Sites with most noncompliant days for DO
 - Upper watershed (BBC11.4, BBC10.8)
 - Middle watershed (BBC7.0 and BBC05.9)



pH Priority areas

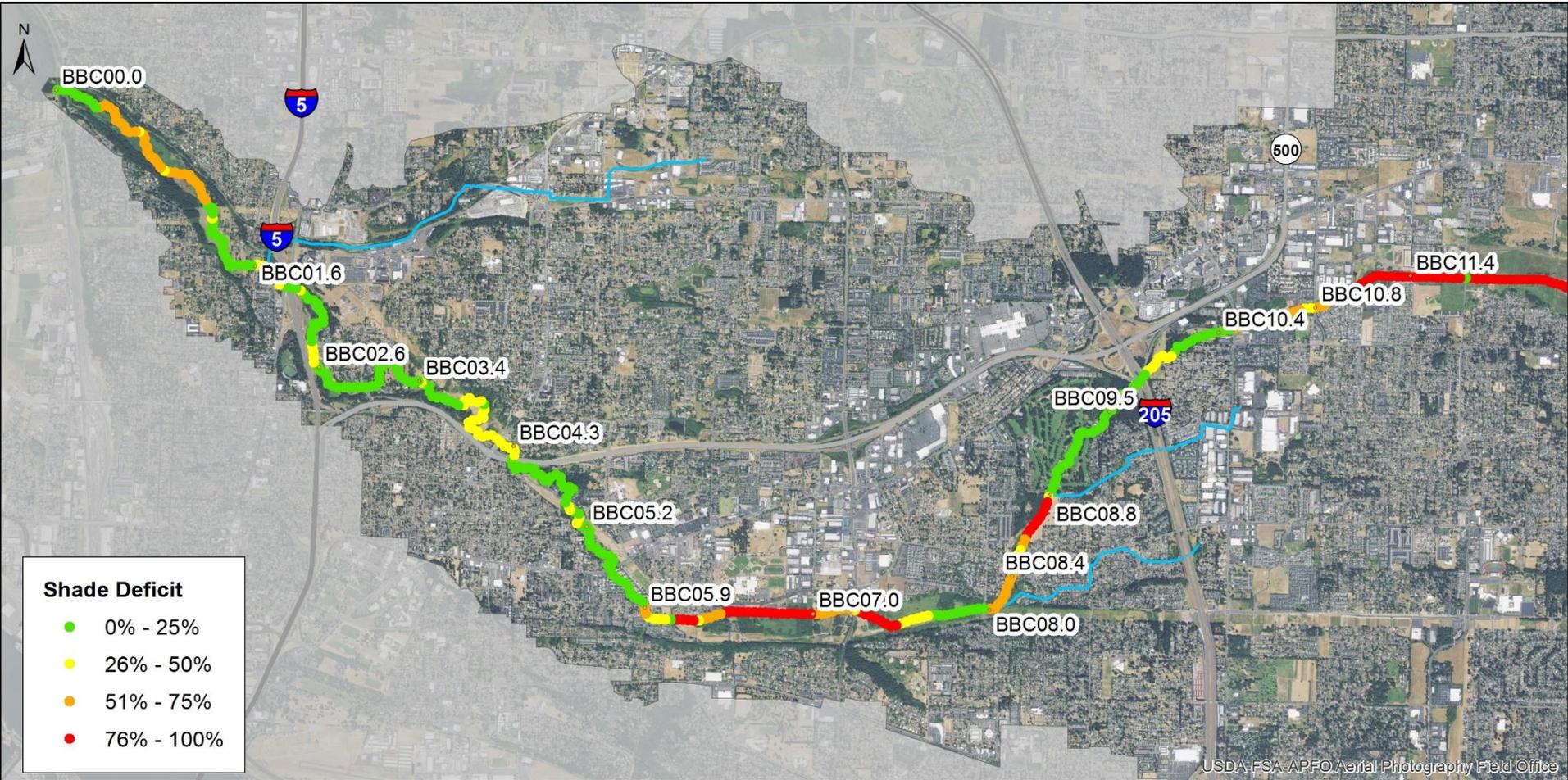
- Highest pH and most noncompliant days at BBC00.0



Temperature Priority areas

- Middle subbasin had highest number of days above criteria
 - BBC05.9 and BBC07.0
- Maximum temperatures at BBC0.00
- All sites exceeded, except for outlet of Cold Creek





BBC00.0

BBC01.6

BBC02.6

BBC03.4

BBC04.3

BBC05.2

BBC05.9

BBC07.0

BBC09.5

BBC08.4

BBC08.8

BBC08.0

BBC10.4

BBC10.8

BBC11.4

Riparian Restoration

- **Riparian restoration**
 - **Upper watershed = 62% average**
 - River miles 12-13 = 87% shade deficit
 - River miles 11-12 = 73% shade deficit
 - **Middle watershed = 39% average**
 - River miles 7-8 = 83%
 - **Lower watershed = 27% average**

Riparian Restoration

- **Priority #1:** Middle and Upper watershed, deficits over 50%
 - **RM12-13** = 87% shade deficit
 - **RM 7-8** = 83% shade deficit
 - **RM11-12** = 73% shade deficit
 - **RM 5.9 and 7.0** for most number of days above criteria

Recommendations

- **Priority #2:** All shade deficits over 30%
 - RM 8-9 = 44%
 - RM 0-1 = 43%
 - RM 4-5 = 36%
 - RM 6-7 = 35%
 - RM 1-2 = 31%

Table 4. Temporal Trend Analysis Summary for Burnt Bridge Creek.

	BBC10.4	BBC8.8	PET0.0	BBC8.4	BUR0.0	BBC7.0	BBC5.9	BBC5.2	BBC2.6	COL0.0	BBC1.6
Temporal Trend for 2011–2017^a											
Temperature	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen	-	-	-	-	-	↘	-	-	-	-	-
pH	-	-	-	-	-	↘	-	-	-	-	-
Conductivity	-	-	↗	↗	-	↗	↗	↗	↗	↗	↗
Turbidity	↗	-	↗	-	-	-	-	-	-	-	-
Total Suspended Solids	↗	-	↘	-	-	-	↘	↘	↘	-	↘
Total Phosphorus	-	-	-	-	-	-	-	-	-	-	-
Soluble Reactive Phosphorus	-	-	↗	-	-	-	-	-	-	-	-
Total Nitrogen	↘	↘	↗	-	-	↘	↘	↘	↘	↗	-
Nitrate+Nitrite	↘	↘	↗	↘	↘	-	-	-	-	-	-
Fecal Coliform	-	-	-	-	↘	-	↘	↘	-	↘	-
Percent Change from 2004–2007 to 2011–2017^b											
Temperature	na	na	1%	-3%	na	1%	-2%	na	na	na	na
Dissolved Oxygen	na	na	-1%	-10%	na	-15%	42%	na	na	na	na
pH	na	na	1%	0%	na	4%	8%	na	na	na	na
Conductivity	na	na	9%	-4%	na	-5%	-2%	na	na	na	na
Turbidity	na	na	46%	155%	na	127%	98%	na	na	na	na
Total Suspended Solids	na	na	34%	117%	na	73%	90%	na	na	na	na
Total Phosphorus	na	na	110%	104%	na	33%	42%	na	na	na	na
Soluble Reactive Phosphorus	na	na	108%	74%	na	42%	51%	na	na	na	na
Total Nitrogen	na	na	19%	83%	na	141%	123%	na	na	na	na
Nitrate+Nitrite	na	na	29%	81%	na	291%	277%	na	na	na	na
Fecal Coliform	na	na	-48%	-46%	na	39%	-5%	na	na	na	na

^a Temporal trend evaluated using Kendall's Tau correlation test ($\alpha = 0.05$). Empty cells are not significant.

^b Percent change in median values from 2004–2007 and 2011–2017. Significant difference between periods tested using Mann-Whitney U test ($\alpha = 0.05$).

↗ = increasing trend

↘ = decreasing trend

- = no significant trend

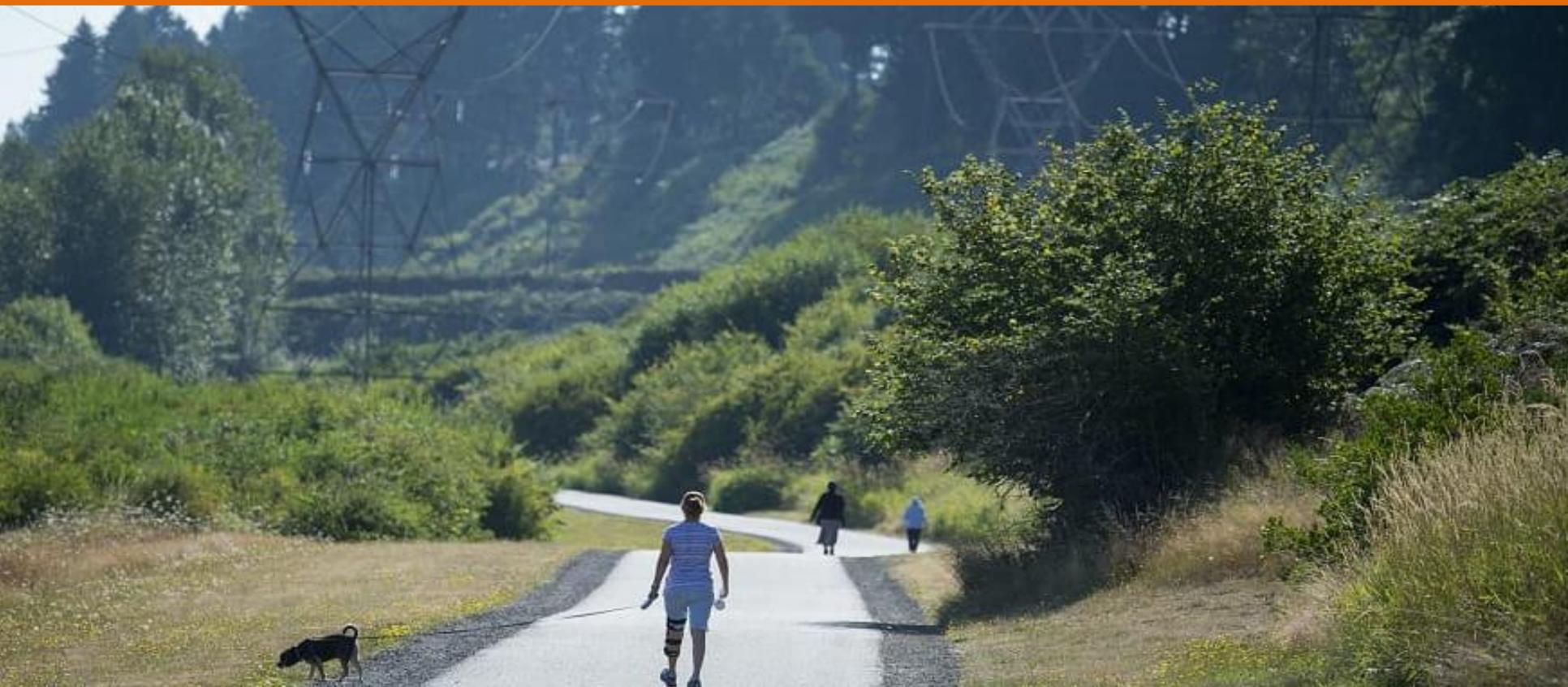
na = not analyzed

↗ = significant water quality improvement

↘ = significant water quality decline

↗/↘ = significant change in pH or conductivity

Implementation Planning Review Worksheets



Discussion topics

- Greenways and sensitive lands
- Stormwater maintenance - IDDE, TVing, catch basin cleaning, street sweeping facility maintenance
- Sewer maintenance – infiltration and inflow
- Erosion control
- Leaf management
- Unhoused population
- Other?



Implementation Planning

- Resources, reports, or websites Ecology should reference for information
 - 1.
 - 2.
 - 3.

Implementation Planning

- **Priority areas for implementation**
 - Examples
 - Subwatersheds
 - Catchments or Drainage areas
 - Neighborhoods
 - Roads
 - River miles
 - Parcel IDs
 - Outfalls
 - Facilities

Implementation Planning

Implementation challenges

1.
2.
3.

Milestones, Targets, and Timelines

Milestones	Target Date
1.	2023
2.	2025
3.	2027
4.	2030
5.	2033

Criteria to measure implementation progress

Performance measures

Criteria to Measure Progress

1.

2.

3.

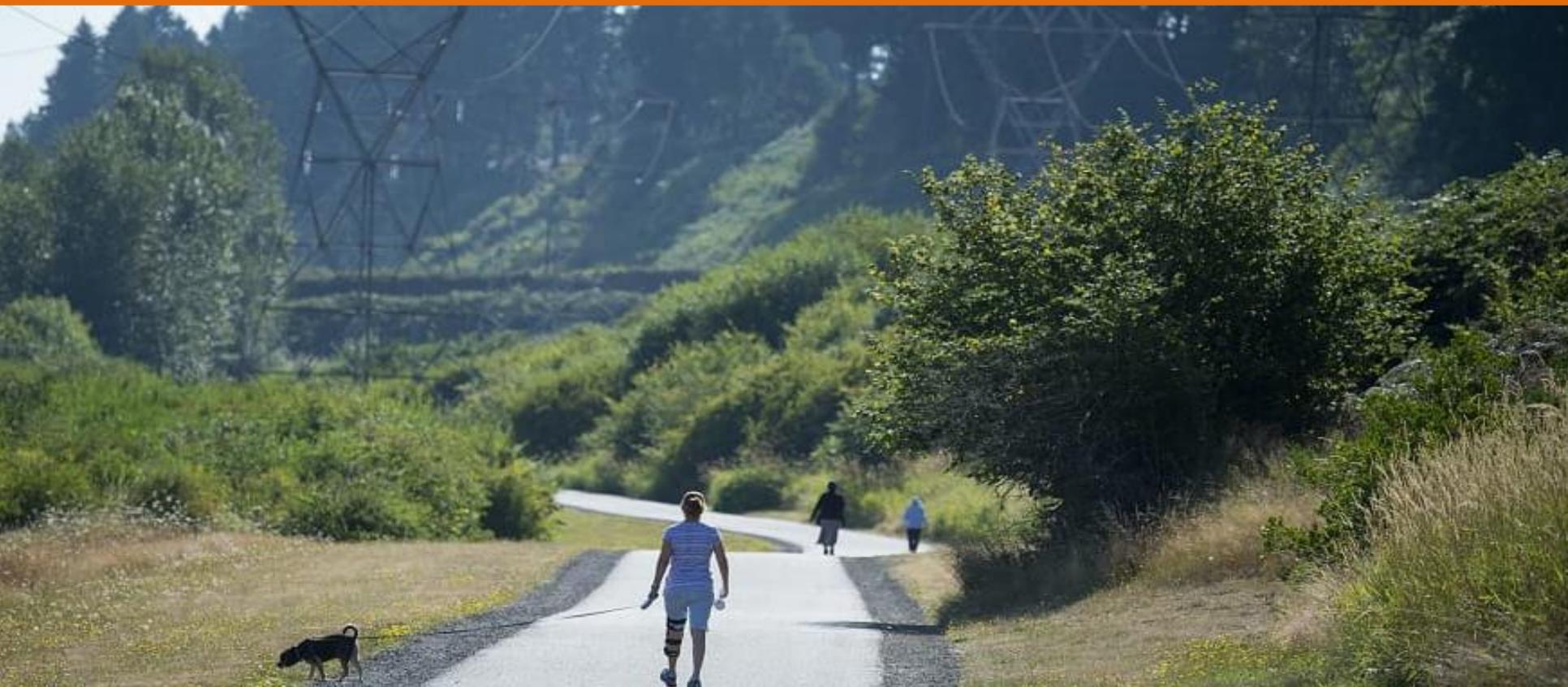
4.

5.

Funding Sources and Partnerships

Funding Sources	
Implementation Partners	

Next Steps



Timeline

- **April-May 2021:** Implementation Workgroups.
- **June 1, 2021:** Completed worksheets due to Ecology.
- **Summer 2021:** Full Burnt Bridge Creek Partnership meeting (report out on what we learned at workgroups)
- **Summer 2021:** External partnership meeting – LCEP, Watershed Alliance, WSDOT, Clark County Clean water Division, Clark County Public Health, Clark Conservation District, LCFRB, etc.
- **Fall 2021:** Public Webinar
- **October 2021:** FY 2023 Funding Applications due!
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www.tinyurl.com/burntbridgecreek

Burnt Bridge Creek Partnership for clean water



[Return to Department of Ecology website](#) | [Burnt Bridge Creek Source Assessment Report](#) | [Report environmental complaints online](#)



Burnt Bridge Creek Watershed Fecal Coliform Bacteria, Temperature, Dissolved Oxygen, and pH

Source Assessment Report



October 2020
Publication 20-04-003

What is the Burnt Bridge Creek Partnership?

The Burnt Bridge Creek watershed located in Vancouver, Washington, is on Washington State's polluted waters list (303d list) for warm water temperatures, bacteria, dissolved oxygen, and pH pollution problems, which drives the need to develop a Water Cleanup Plan. In October 2020, the [Burnt Bridge Creek Source Assessment Report](#) was published to identify critical areas for water quality improvement. This Source Assessment identifies portions of Burnt Bridge Creek that are not meeting water quality standards. The report also identifies the largest shade deficits in the watershed to focus tree planting efforts, and determines the bacteria reductions needed to meet water quality standards.

To implement recommendations from the Source Assessment, the [Burnt Bridge Creek Partnership](#) was formed in February 2021 to develop and implement the Water Cleanup Plan. This Water Cleanup Plan will focus on best management practices and implementation actions to improve water quality. The Partnership will meet regularly through 2022.

Questions about the Burnt Bridge Creek Partnership should be directed to [Devan Rostorfer](#), Water Quality Specialist, Washington State Department of Ecology.

Past Events & Meeting Materials

- [February 2, 2021 - Burnt Bridge Creek Partnership kickoff meeting](#)
 - [Agenda - February 2021](#)
 - [Presentation - Overview of process](#)
 - [Presentation - Burnt Bridge Creek Source Assessment](#)
 - [Burnt Bridge Creek Source Assessment Report](#)
 - [Meeting Summary - February 2021](#)

Local Resources

- [City of Vancouver Stormwater, Surface Water, and Groundwater Utility](#)
- [City of Vancouver Urban Forestry](#)
- [City of Vancouver Water Resources Education Center](#)
- [City of Vancouver Sewer System & Wastewater Treatment Facilities](#)
- [Stormwater Partners of Southwest Washington](#)
- [Burnt Bridge Creek Trail](#)
- [Explore Your Watershed](#)
- [Project Restore](#)

FY 2023 Call for Projects

Grant Funding Opportunities

- One of our regional goals is to help local jurisdictions develop competitive applications for Ecology Water Quality grants.
- To encourage communication earlier in the process and provide more time for project proposal development, Ecology is asking interested applicants to complete a short “Notice of Intent” form by **June 15, 2021**.
- Ecology will still host statewide application workshops in August and the final applications are due October 12, 2021.
- For more details please visit <https://tinyurl.com/ECY-SWRO-Grants>, or contact Leanne Whitesell, Regional Fund Coordinator, *Nonpoint Activity Projects*, (360) 407-6295 or Leaw461@ecy.wa.gov.

Thank You!



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