



King County

Water and Land Resources Division

Department of Natural Resources and Parks
King Street Center
201 South Jackson Street, Suite 600
Seattle, WA 98104-3855

206-477-4800 Fax 206-296-0192

TTY Relay: 711

August 2, 2016

To: Brandi Lubliner, Washington Department of Ecology (Ecology)
From: Curtis DeGasperi
Subject: Project Status Update for King County Regional Stream Monitoring Program (RSMP) Streams Data Analysis – 2nd Quarter, 2016
Project #: IAA No. C1500077

This narrative represents Deliverable 4.1 for the second quarter (Q2) of 2016 (April 1-June 30, 2016). A narrative was not needed for the first quarter of 2016, due to a delay in contracting. This document summarizes the work conducted for the RSMP Streams Data Analysis. Note that “Project Team” below refers to Brandi Lubliner (Ecology, RSMP Project Coordinator), Chad Larson (Ecology), Rich Sheibley (U.S. Geological Survey – USGS), and Leska Fore (Puget Sound Partnership – PSP)

Task 1. Streams status assessment

- Deliverable C1.1 Compile appropriate screening thresholds
 - Research was conducted to identify screening levels for stressor and response metrics that would be appropriate for use in evaluating the relative risk that measured stressors pose to selected response metrics (e.g., Benthic Index of Biotic Integrity). Research included communication with Patrick Moran, USGS, who has expertise in the effects of freshwater sediment contamination on stream benthic invertebrates. In addition to literature research and compilation of state water quality and sediment standards, Puget Sound reference site data provided by Ecology were used to derive screening thresholds for habitat metrics and water quality metrics for which state standards did not exist (e.g., nutrients). A draft document was shared with the project team for review on June 17, 2016 (RSMP_Screening_Levels_draft_160617.docx). A final version of the document that incorporates feedback from the project team will be submitted in the third quarter of 2016.
- Deliverable C1.2 Choose landscape variables to include in analysis
 - The selection of landscape variables to include in the analysis was discussed on a number of project team conference calls. The project team agreed to leverage the work being conducted by the USGS as part of the National Water-Quality Assessment (NAWQA) Program. The list of landscape metrics to be included in the study was shared by Rich Sheibley with the project team as an Excel workbook on May 16, 2016 (MSQA_GIS_summary_051316.xlsx). The landscape

metrics will include metrics calculated at a watershed and riparian scale based on methods that will be documented by the USGS.

Task 2. Comparison of probabilistic monitoring results to targeted monitoring program results

- Deliverable C2.1 Inventory data collection efforts by other existing stream monitoring programs: King Co. Status and Trends
 - King County databases were queried to inventory water, sediment, habitat, and biotic monitoring that would be comparable to data collected as part of the RSMP Streams Study. Inventories were provided as Excel workbooks to the project team on June 13, 2016 (WRIA8_Status&Trends_inventory.xlsx; King County_ambient_monitoring_inventory.xlsx).

Task 3. Recommendations for future RSMP small streams monitoring

- No activity on this quarter

Task 4. Project Management

- Deliverable C4.1 Project management and quarterly project status updates
 - Produced and submitted this quarterly report.
 - Set up Google Site for project team communication and data sharing with Leska Fore's assistance.
 - Lead and participated in nearly weekly hourly WebEx project team meetings (Five meetings in the 2nd quarter beginning on May 9, 2016).
 - Phone conversations and email communications with RSMP Project Coordinator.

TASK 1: STREAMS STATUS ASSESSMENT

Deliverable	Description	Deliverable Target Date	Explanation/Comments	Status
C1.1	Compile appropriate numeric screening thresholds for water, habitat, sediment and biota data (e.g., numeric thresholds for fair, good, poor or supporting and not supporting). Products will include an electronic list (Word or Excel) format.	June 30, 2016	Draft Word document provided to project team for comment.	Final document to be completed in 3 rd quarter 2016
C1.2	Choose independent variables to include in analysis and calculate them (e.g., buffer or contributing watershed). Products will include an electronic list (Word or Excel) format.	June 30, 2016	Variables and scales of analysis chosen and documented in Excel file.	Completed
C1.3	Conduct GIS analysis to calculate factor metric values (drainage area, percent impervious, etc.) for each site. Products will be in ArcGIS and Excel tabular format and include multipurpose maps.	June 30, 2016	Work initiated by USGS	Expected completion in 3 rd quarter 2016
C1.4	Assist team by providing standard curves for sites located in KC to assist with calculation of WQI. Provide electronic file with flow and WQI parameter data to be used for development of standard curve for a typical small stream in King County lowlands.	June 30, 2016	No assistance was necessary. Default curves were used throughout.	Not necessary
C1.5	Develop CDFs for each water, sediment, habitat metrics for data collected within and outside UGAs and PS lowland ecoregion.	June 30, 2016	Delay in development of final data sets for analysis.	Expected completion in 3 rd quarter 2016

Deliverable	Description	Deliverable Target Date	Explanation/Comments	Status
C1.6	Conduct categorical analysis for metrics with screening thresholds for data collected within and outside UGAs and compare.	July 30, 2016		
C1.7	<p>Conduct relative risk analysis using stressor metrics with defined thresholds if possible. Identify which are the response variables of interest (e.g., B-IBI and periphyton) and which are the independent variables to test (e.g., land cover, water and sediment quality and habitat measures). Assume the thresholds are easy to define either from existing data or from simple percentiles.</p> <p>Assist team with preparation of handouts for workshop; brief report summarizing themes from comments. Co-host workshop to present results to SWG/FWG and permittees, collect comments for additional analyses.</p>	September 30, 2016		
C1.8	<p>Present results in draft and final report and summary handouts. Include CDFs and box plots, categorical assessments in terms of % of sites in good, fair, and poor condition inside and outside UGAs, PS lowland whole. Identify variables that correlate with stream quality.</p> <p>Discuss results from comparisons to standards, relative risk/attribution risk effort, signal to noise analyses, and discern valuable parameters for the future RSMP small streams trend program.</p>	December 31, 2016 for draft; March 31, 2017 for final		

Deliverable	Description	Deliverable Target Date	Explanation/Comments	Status
	Recommendations for parameters and also frequency of the various RSMP small stream monitoring components (flow, bug, water quality, sediment quality) will be made to both the Stormwater Work Group and Freshwater Work Group.			

TASK 2: COMPARISON OF PROBABILISTIC MONITORING RESULTS TO TARGETED MONITORING PROGRAM RESULTS

Deliverable	Description	Deliverable Target Date	Explanation/Comments	Status
C2.1	Inventory data collection efforts by other existing stream monitoring programs: King Co Status and Trends	May 31, 2016	Inventory included ambient monitoring program data in addition to Status & Trends study	Completed
C2.2	Develop screening criteria for selection of data for use in this study including available documentation on QA/QC procedures	May 31, 2016	Project team decided to focus on programs with documented QA/QC procedures – Ecology, USGS, King County, and RSMP	Consideration of action for this task pending
C2.3	Compile water, sediment, habitat, and biota data from selected monitoring programs.	July 30, 2016		

Deliverable	Description	Deliverable Target Date	Explanation/Comments	Status
C2.4	Develop and compare CDFs for each water, sediment, habitat, and biological metric for each program	July 30, 2016		
C2.5	Present results in draft and final report sections; and summary handouts. Discuss results comparing probabilistic and target programs. Include CDFs and box plots, categorical assessments in terms of % of sites in good, fair, and poor condition inside and outside UGAs, PS lowland whole.	September 30, 2016 for draft report section; November 30, 2017 for final		
C2.6	Assist team in preparation of a short handout for SWG	September 30, 2016		
C2.7	Summarize analysis options from team members for RSMP Coordinator for optional additional analyses related to targeted programs. Tee up choices about which analyses to pursue, descriptions of issue and options for decisions; short summary of people contacted, themes, for analysis and decisions made.	September 30, 2016		

TASK 3: RECOMMENDATIONS FOR FUTURE RSMP SMALL STREAMS MONITORING

Deliverable	Description	Deliverable Target Date	Explanation/Comments	Status
C3.1	Estimate components of variance for metrics with repeat-sample data from other programs, estimate precision, identify metrics with sufficient precision for detecting differences in stream quality (e.g., temporal variance < spatial variance)	May 31, 2016	Delay in development of final data sets for analysis.	Expected completion in 3 rd quarter 2016
C3.2	Calculate variance of monthly water quality values, evaluate seasonal patterns, estimate the increase in precision from monthly sampling (C3.2) Assist team with communicating results and options for RSMP coordinator and SWG (C3.2a)	May 31, 2016	Delay in development of final data sets for analysis.	Expected completion in 3 rd quarter 2016
C3.3	Evaluate statistical power to detect trends based on estimated precision of selected metrics, determine the number of samples to detect a specified (e.g., 25%) change in stream quality (C3.3) Interpret results and options. Assist team with communicating results and options for RSMP coordinator and SWG. (C3.3a)	July 30, 2016		
C3.4 (optional)	The RSMP Coordinator will give permission to conduct this optional work. This deliverable with approval will examine spatial correlation of stream quality for nested sites, identify criteria for “spatially-independent sites”	July 30, 2016		

Deliverable	Description	Deliverable Target Date	Explanation/Comments	Status
C3.5 (optional)	The RSMP Coordinator will give permission to conduct this optional work. This deliverable with approval will describe based on a couple parameters (Cu, TSS, maybe another) likely sources, transport, and potential effects of stormwater management (structural/non-structural, source control, etc.); identify key gaps in understanding how stormwater management affects key parameter/pollutant	September 30, 2016 for draft report section; November 30, 2017 for final		
C3.6	Interpret results and options for answering SWG questions about WQ; meet with scientists, provide written comments to scientists	September 30, 2016		
C3.7	Assist team with preparation of short written description of data to be collected for the next round of adaptive management.	September 30, 2016		
C3.8	Write draft report sections related to this task. Incorporate comments for final report.	December 31, 2016 for draft; March 31, 2017 for final		

TASK 4: PROJECT MANAGEMENT

Deliverable	Description	Deliverable Target Date	Explanation/Comments	Status
C4.1	Project management and quarterly project status updates	June 30, 2016	End of Quarter Dates: March, June, September, and December in 2016, and March and June in 2017	Completed 2 nd quarter 2016 project status update