

Amendment No. 2 to Quality Assurance Project Plan (QAPP) for Status and Trends Monitoring of Marine Nearshore Mussels for the Regional Stormwater Monitoring Program and Pierce County

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This amendment documents changes to the QAPP for Status and Trends Monitoring of Marine Nearshore Mussels for the Regional Stormwater Monitoring Program and Pierce County (WDFW Publication no. FPT 15-04) and the Amendment to Quality Assurance Project Plan (QAPP) (WDFW Publication no. FPT 17-07) for the 2019/20 Stormwater Action Monitoring Mussel Monitoring survey.

Global changes to all sections of the QAPP

- We change all references to the winter of 2017/18 to the winter of 2019/20.
- We change all deployment dates from November 2017 to October 2019, and all retrieval dates from February 2018 to January 2020.
- Pierce County roles are omitted as they opted-in under the new permit cycle (implemented August 2019) and no longer have separate monitoring sites.

WDFW and Ecology Roles

The 2019/20 SAM Mussel Monitoring will occur within the period of October 2019 to January 2020.

Table 1. Key completion dates for QAPP, monitoring activities, and reports for status and trends monitoring in the Puget Sound nearshore.

| Due | Item | Description |
|--------------------|---------------------------------|---|
| July 31, 2019 | Draft QAPP amendment submitted | WDFW submits draft QAPP to Ecology for review. |
| August 31, 2019 | Final QAPP amendment approved | Final QAPP completed and accepted by Ecology. |
| September 30, 2019 | Site selection and verification | WDFW have confirmed all the sites to be monitored, including a few additional sites to sample if sampling attempted at any of the original sites is unsuccessful. |
| November 3, 2019 | Mussel cages deployed | WDFW volunteers deploy mussel cages at the required number of nearshore sites. |

| | | |
|------------------|--|---|
| January 27, 2020 | Mussel cages retrieved and mussels delivered to WDFW | WDFW volunteers retrieve mussel cages from the required number of nearshore sites and deliver the mussels, alive on ice, to the WDFW Marine Resources Laboratory in Olympia on the morning following retrieval. |
| March 30, 2020 | Send samples to laboratories. | WDFW submits frozen mussel tissue samples to the SAM contracted laboratories for chemical analysis. |

Quality Objectives

Table 2. Summary of mussel tissue composites to be collected and analyzed for chemical contaminants during this study.

| Purpose | Location | Timing | Composites | Replicates |
|---------------------|--------------------------------|---|------------|----------------|
| Baseline samples | Aquaculture source (Penn Cove) | October | 3 | 3 |
| SAM mussel sites | Various | January | 40 | 1 per site |
| SAM reference site* | Penn Cove | January | 1 | 1 |
| Lab QA samples | Various | Aliquots taken during chemical analysis | 9 | 9 ^a |
| Total | | | 53 | |

^a three QA samples per batch of 12

*For the 2017/18 survey, a reference site was established on the Penn Cove shoreline, near our aquaculture source. Future surveys will continue to include this reference site. A mussel cage will be anchored on site during the same exposure period as the other SAM mussel monitoring sites. This will provide a shoreline reference condition of mussel tissue contaminant concentrations after the exposure period at the aquaculture source, in addition to the baseline samples starting contaminant concentrations.

Field Datasheets and Chain of Custody

WDFW will make a *2019/20 SAM Mussel Monitoring Datasheet* available to the volunteers and partners on water-resistant paper and in digital format (for print) for each verified and usable site. We will record the same field measurements as in the 2017/18 survey (Table 3 in FPT 17-07) and continue to record chain of custody signatures on the retrieval portion (back page) of the study data sheet.

Deployment/Retrieval Dates

Table 3. Potential deployment and retrieval dates for SAM mussel monitoring in 2019/20. Dates are based on predicted low tides at Seattle, Elliott Bay harmonic station (NOAA).

| Low Tide Event | Deployment Dates | Retrieval Dates |
|-----------------------|-------------------------------|------------------------|
| Preferred | October 27 – November 2, 2019 | January 20 – 26, 2020 |
| Alternate | November 11 – 19, 2019 | February 5 – 12, 2020 |

Deployment

Pick Up and Transport SAM-Approved Mussels to the Monitoring Site

Each deployer will get five (previously four) bags of mussels (20 mussels per bag) per mussel cage to be deployed.

Secure the Mussels into the Cage

Deployers will no longer be required to wear nitrile gloves when handling the mussel bags.

At the mussel site, deployers will affix the five mussel bags to the top third (1/3) of the anti-predator cage, so that they span the width of the cage and are spaced evenly apart in a staggered pattern (Figure 1).



Figure 1. Mussel bags affixed to the top third of an anti-predator cage, lid not shown.

Retrieval

After field measurements, the retrievers will remove the five bags of mussels from the cage, keeping the mussels in the bags and the mesh intact, and place the bagged mussels immediately into a large, pre-labeled Ziploc bag(s).

Lab Forms

Paper forms and/or digital versions (collected on iPads) of the WDFW Specimen Form and Tissue Resection Log will be used to record all laboratory measurements.

Stable Isotopes

We measured stable isotopes in mussels for the 2017/18 SAM Mussel Monitoring survey and will continue to do so in the 2019/20 survey.

Laboratory Data

WDFW staff will record laboratory data on paper forms and/or electronic tablets (e.g., iPads) with digital versions of the Specimen Form and Tissue Resection Log.

SAM Mussel Monitoring Summary Report

The final 2017/18 SAM Mussel Monitoring summary report is due to Ecology on February 28, 2020. Results from this survey will be used to describe the status of chemical contamination (cumulative frequency distribution) of mussels in the nearshore UGAs of Puget Sound, and will be compared with the results from the previous 2015/16 RSMP/SAM Mussel Monitoring efforts, where appropriate.

The final 2019/20 SAM Mussel Monitoring summary report is due to Ecology on June 30, 2021. Results from this survey will be used to describe trends observed over three completed survey years: 2015/16, 2017/18, and 2019/20.