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Technical Memorandum

Date: May 5, 2006
To: WRIA 54/57 Instream Flow Technical Team
c: *Central Files (2-1)*
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Project No./Name: 3640021/22-002 /
WRIA 54/57 Instream Flow Studies
Subject: *Draft Final WRIA 54/57 Scope of Work for Instream Flow Assessment-*
Ecology grant nos. G0600279 (WRIA 54) and G0600203 (Lower WRIA 57)

Presented below is the scope of work to conduct the Instream Flow Assessment for the Lower Spokane River and Tributaries (WRIA 54) and the Lower Section of the Middle Spokane River (Lower WRIA 57). This scope incorporates the Instream Flow Technical Team's (IFTT) agreement on the purpose and objectives for this assessment and their input on priorities and methods for the mainstem Spokane River in WRIsAs 54 and 57 and selected tributaries from the WRIA 54. Alternate instream flow methods, including Benthic Index of Biotic Integrity (BIBI) and Normative flow analysis, were discussed by the IFTT and not selected. Reasons for not selecting these alternatives included limited funding and lack of wide spread acceptance of both methods for resolving water quantity instream flow issues.

PURPOSE STATEMENT AND OBJECTIVES

The purpose and objectives for the Instream Flow Assessment were discussed and agreed upon by the IFTT as follows.

Purpose Statement

Overarching Purpose: To generate information necessary for the Planning Unit to make recommendations to Ecology for instream flow. (Definition of instream flow: stream flow needed to protect and preserve instream resources and values, such as fish, wildlife, and recreation.)

Objectives (Parentheses indicate group responsible for implementing objective)

The objectives of addressing instream flow issues are to:

- Identify the river segments and tributary segments that are to be the focus of instream flow efforts. (Instream Flow Technical Team)
- Identify appropriate species and life stages for instream flow consideration and focus of scientific evaluation. (Instream Flow Technical Team)
- Consider limits of funding; identify those segments that should be subject to detailed flow and fish condition analysis, those segments that should be subject to a more general analysis



and evaluation, and those segments where, while recommendations may be made, minimal or no analysis and evaluation will be made. (Instream Flow Technical Team)

- Identify appropriate study approaches for the selected segments. (Instream Flow Technical Team)
- Conduct instream flow scientific studies and analysis that will produce “best available science.” (Tetra Tech Team)
- Use the scientific studies and other information to make preliminary recommendations. (Tetra Tech Team)
- Understand and consider existing water rights in any instream flow recommendations. Water right data is currently being compiled for the WRIA 54 Watershed Plan Technical Assessment. (Planning Unit)
- Set instream flow levels that consider human water needs. (Planning Unit)
- Consider input from Planning Unit members, Tribes, appropriate agencies, and the public in developing recommendations. (Planning Unit)
- Make instream flow recommendations. (Planning Unit)
- Make sure rulemaking reflects the Planning Unit’s recommendations. (Planning Unit)

SCOPE OF WORK

Mainstem Spokane River

The Instream Flow Assessment on the mainstem Spokane River will focus on the free flowing segment from the Monroe Street Bridge to the backwater from Nine-Mile Reservoir. This reach includes the lower mile of WRIA 57 (Monroe Street bridge to Latah Creek confluence) downstream to the Nine Mile reservoir backwater, at approximately River Mile (RM) 64, eight miles downstream from the Latah Creek confluence. The upper WRIA 54 and lower WRIA 57 segments of the Spokane River have similar overall channel shape, hydraulic issues, and fish species. It reasonable to employ the same methodology in both WRIA 54 and 57.

Methods. Given the importance of the aquatic resources in the mainstem Spokane River, the influence of known aquifer inflow on both water quantity and water temperature within this reach, and the potential for future water needs, an Instream Flow Incremental Methodology (IFIM) will be used. This approach is both widely accepted and defensible and is used successfully on rivers throughout the United States. Tasks in the IFIM scope of work include:

- Quality Assurance Project Plan (QAPP)
- Habitat mapping based on aerial photos and ground truthing
- Transect selection
- Agency transect approval
- Transect weighting
- Site setup and surveying
- High flow velocity calibration measurements, discharge and water surface elevations (WSEs)



- Mid flow discharge and WSE measurements
- Low flow discharge and WSE measurements, substrate and cover mapping, and surveying streambed cross section
- Data entry
- Calibration of hydraulic model using RHABSIM
- Agency review and approval of hydraulic model
- Computation of fish habitat by transect, river reach, species and life stage using RHABSIM
- Production of report including location, methods, and results presented both graphically and in table format

EES Consulting (EESC) will employ a subset of the IFIM known as the “one-velocity set method,” or the “one-flow method.” This method uses one full set of depth and velocity measurements across all stations on each transect, collected at the high calibration flow. Water stage elevations (WSEs) will be taken at the high-flow calibration measurement, as well as at the middle and low calibration flows. Discharge measurements will be taken at the middle and low flows at each study site only to determine the correct flow and water stage relationship.

EESC has selected and obtained agency approval to measure and model 7 transects within the WRIA 54/57 reach. With these transects, the major habitat types, except the extreme habitats and relatively scarce habitats such as rapids and islands, will be represented. Location of the approved transects are shown in Figures 1 and 2.

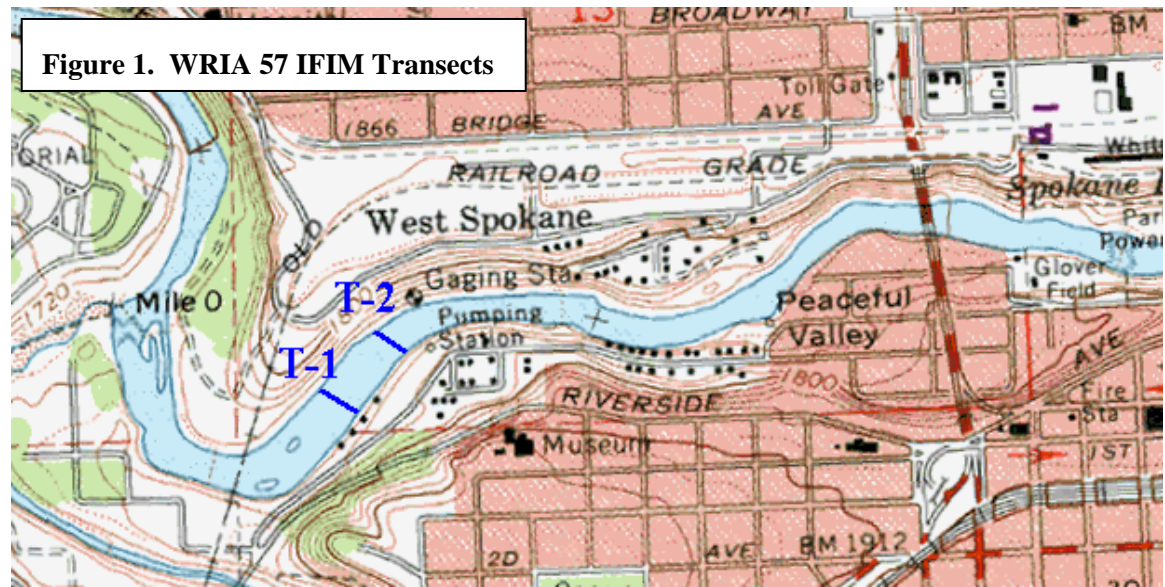




Figure 2. WRIA 54 IFIM Transects



To qualitatively assess the riffle habitat, one photo point was established in WRIA 57 and two photo points were established in WRIA 54. The WRIA 57 photo point is located on the Centennial Trail Bridge, just downstream of Transect 1 (Figure 1), and will be used to photograph riffles upstream and downstream of the bridge. In WRIA 54, the first photo point is located on Petit Drive (top of Doomsday Hill) to view the riffle associated with the island complex near the T.J. Meenach Bridge. The second photo point is located on Aubrey Parkway, looking downstream to Rifle Club rapids (Fig 2). The photographs of the riffles in both WRIA 54 and 57 will be taken by Spokane County staff and used to document changes in riffle habitat with changing flow.



Schedule. With the current above-average snow pack, it is anticipated that the high flow calibration measurements will occur in July, with middle and low flow calibration measurements in August or September. The field schedule will depend on the timing, duration and intensity of snowmelt. Avista Utilities may be able to partially control flows and allow the middle and low flow measurements to be taken within the same week.

Consultation, Analysis and Reports. As previously stated, this scope of work includes a site visit to obtain agency approval of transects, stream measurements, calibration and modeling of all transects, agency review of modeling calibration details, and a report including methods and results. It is also anticipated that members of the Instream Flow Technical Team and appropriate agencies (WDFW, Ecology, Tribes) will be encouraged to assist with or review transect selection.

Deliverables. EESC will generate a draft and final report detailing the scoping, field investigations and model calibration and habitat indices (WUA) generation, for the Planning Unit. EESC will include a comment response table on items and issues raised by members of the IFTT or Planning Unit(s).

Tributaries

Based on input from local Washington Department of Fish and Wildlife and Spokane Tribal Water and Fish representatives and Spokane Tribal Department of Natural Resources representatives, Deep Creek, Coulee Creek, and Little Chamokane Creek were selected for instream flow analysis. In addition, the lower portion of Spring Creek will be assessed for required flows for springtime spawning of adfluvial trout. The tributaries were selected based on having perennial flow and important fish populations in the targeted segments.

Methods. The Toe-Width method will be utilized to evaluate flows in these tributaries. This method uses the width of the stream bed, as measured by the toe of the bank, to compute the discharge necessary to provide adequate fish habitat. The assessment requires that cross sectional profiles be measured at 2 to 4 appropriate transects on each stream. Tasks include identifying the “toe of bank,” both in the field and on the cross section and computation of flows for rearing trout based on the toe width. A short report will detail locations of tributaries sampled, methods used, results, and discussion.

Because the costs for sampling and analysis of the four tributaries would exceed that provided under the Ecology instream flow grants, representatives from the Washington Department of Ecology and Department of Fish and Wildlife as well as the Spokane Tribe have offered assistance in completing the field measurements for the Toe-Width Study. This assistance will allow all four tributaries to be assessed, and lend valuable local experience to areas of the creeks are most suitable for study.

The instream flow assessment for all four tributaries will be conducted through a coordinated effort as follows:

- EESC will schedule the field work in each stream and coordinate with participating agency staff. The Department of Ecology, Department of Fish and Wildlife, and Spokane Tribe have offered staff time to assist with identification of appropriate sample sites and collection of field data.
- A biologist from EESC will accompany the local representatives in the field. This will provide assurance that the sites and measurements are sufficiently documented with appropriate surveying and photographs to allow EESC to analyze and report the results.



- EESC will conduct analysis and reporting for each of the tributaries.
- The Spokane Tribe will fund the analysis work for Little Chamokane Creek and Spring Creek through a separate contract with EESC. Estimated cost for this work is \$4,000.

Schedule. The field work for the Toe-Width study is not flow sensitive. Toe width measurements will be conducted between June and September in conjunction with field work on the Spokane River.

Deliverables. EESC will generate a draft and final report detailing the methods, field measurements and results, for the Planning Unit. EESC will include a comment response table on items and issues raised by members of the IFTT or Planning Unit.

QUALITY ASSURANCE PROJECT PLAN (QAPP)

The Washington Department of Ecology requires a Quality Assurance Project Plan (QAPP) to be prepared for all projects that gather data with grants or plans under its jurisdiction. EESC will prepare a QAPP based on the Washington Department of Ecology and Washington Department of Fish and Wildlife Joint Instream Flow Study Guidelines. The plan will present the objectives of the study and detail what will be done, when it will be accomplished and who will do it. It will also detail what quality assurance steps will be undertaken and reviews that will take place during the course of the study.