Normative Flow Studies Project

Goal Statement

In order to promote salmon conservation and ecosystem integrity within King County, develop and employ Normative Flow[1] concepts to influence policies and programs and optimize management actions that affect or respond to river and stream flow conditions.

Key Objectives

- Develop a valid and defensible river and stream assessment method, employing and testing Normative Flow concepts, for use in King County rivers and streams.
- Develop new analytical tools (e.g, models, databases, etc.) and/or adapt existing tools to support the assessment method.
- Provide the analytical tools to WRIAs and other interested parties for consideration and use as needed to fill gaps in technical programs.
- Develop and employ educational tools that improve understanding of Normative Flow analysis and its relevance to policy and program development and implementation.
- Apply the assessment method to evaluate the efficacy of current or proposed flow management measures for ecosystem and conservation objectives.
- Formulate flow management recommendations based upon the assessment and analytical methods.
- Use the flow management recommendations to inform technical, regulatory (e.g, permitting), and policy decisions specific to King County.
- Monitor and evaluate the effectiveness of management actions based upon Normative Flow concepts to develop and implement corrections in analysis and actions as a result.

King County Interests Related to Flow Regime

King County, as a local general purpose government and a participant in several comprehensive and collaborative efforts supporting the recovery of salmon, has an ongoing interest in understanding the effects of its actions on flows in rivers and streams that support salmon, and the effectiveness of these actions in protecting or restoring a flow regime that supports salmon conservation and ecosystem integrity goals. In these capacities King County, like other local jurisdictions, expects to be challenged to minimize the harm to salmon from its ongoing activities, to contribute toward fisheries and habitat restoration planning and implementation, and to be held accountable for the effectiveness of its activities and expenditures toward these goals.

[1] "Normative Flow" refers to a flow regime that resembles the natural flow regime sufficiently to sustain all life stages of a diverse suite of native species, including salmonid populations.

Flow regime will be a key factor in any jurisdiction's ability to play a constructive role in local and regional efforts to achieve these goals because the success of habitat protection or restoration actions often depends on a supply of an appropriate amount of water at a certain time. Human activities have altered the flow regime in many King County rivers and streams in ways that may jeopardize the efficacy of those habitat actions. King County implements numerous programs and projects that in major and minor ways affect and/or respond to flow regimes, including the following:

- Development and use of reclaimed water resources
- Implementation of aquatic/riparian habitat restoration and protection measures over several decades using local, state, federal and private funding
- Operation and maintenance of a regional wastewater management system, and mitigation for its impacts
- Regulation of and planning for land use in floodplains and in upland areas
- Maintenance, restoration and/or removal of flood management facilities (e.g., setback levees, flood control structures) and acquisition of floodprone properties
- Implementation of stormwater management requirements under federal and state law (e.g., NPDES)
- Management of groundwater resources
- Implementation of water quality measures to meet TMDLs
- Monitoring of habitat and species, and pursuing resultant adaptive management actions

Basis for Adopting a Normative View of Flow Regime

King County is one of several parties interested in the role of flows and flow management actions in achieving salmon conservation and ecosystem integrity goals. The need for "flow analysis" has been made apparent in several venues in the Tri-County area, including in WRIA processes and discussions of regional water supply planning. In the opinion of King County scientists, flows set following "minimum flow" analysis concepts have provided limited protection for fish in the Puget Sound basin; new or modified flow standards for King County rivers and streams established in the future under similar approaches are not likely to be very useful in guiding actions to meet current desired conservation outcomes. Flow analysis techniques employed in prior studies lack the conceptual framework to adequately respond to the complex conservation challenge at hand in the watersheds in King County.

An analytical approach based upon Normative Flow concepts holds considerable promise for evaluating how flow regimes in our complex watersheds could be influenced in beneficial ways. This approach stresses the importance of pattern and temporal variation in flow attributes – not only magnitude, but frequency, duration, timing, spatial distribution and rate of change of flows as well – in creating and sustaining the complex instream and floodplain conditions to which naturally spawning salmon have successfully adapted over centuries of evolution. Its emphasis on multiple aspects of the flow regime that create and sustain suitable habitat conditions, in contrast to setting minimum (or maximum) flows, is what distinguishes the normative approach and establishes its promise and appropriateness for application in a comprehensive, ecosystem-based conservation and recovery strategy.