



# New technology improves river management

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The U.S. Army Corps of Engineers and The Nature Conservancy have joined forces to develop the Hydrologic Engineering Center's Regime Prescription Tool (HEC RPT), a software program to help teams reach agreements on managing the flow regime of a river.

The idea for this software was conceived during a Sustainable Rivers Project workshop, where scientists worked together to formulate a set of ecosystem flow recommendations — the flows needed to sustain or restore ecosystems connected to the river.

Throughout the workshop, hydrographs were created, discarded and morphed. Facilitators lacked an easy way to present the recommendations. It was noted that a tool capable of rapidly displaying, adjusting and documenting hydrographs would make the formulation process easier. If the tool was also capable of accessing and plotting historical hydrologic data to guide the scientists, then the product as well as the process would be improved.

HEC RPT is designed to meet these needs by facilitating entry, display and documentation of flow recommendations and justifications in real-time public settings. It is a visualization tool and not intended to perform the quantitative analyses already performed by other software packages. Instead, HEC RPT seeks to complement those packages by making it easier to create flow times series that other software can import and use in analyses.

The Willamette River is the latest

Sustainable Rivers site to complete an ecosystem flows workshop and the first to use HEC RPT to help formulate flow recommendations.

“Before the workshop, I was concerned that the RPT might be a distraction for the scientists as they worked to define flows for the ecosystem, but I came away a firm believer in its value as a decision-support tool. Its ability to quickly and simply display a huge amount of hydrologic data is very powerful,” said Matt Rea, the Willamette Basin coordinator from the Corps’ Portland District.

During the workshop, more than 40 scientists from government agencies, universities and non-government organizations worked to identify critical ecosystem flows for key species and ecological processes on the Middle and Coast forks of the Willamette River.

Two groups formed to define the river flows needed to keep their aspect of the ecosystem healthy and functioning. The process began by overlaying the life stages of key species with the natural flow patterns of the Willamette. Connections between the species and flows were identified and incorporated into the flow recommendations.

HEC RPT was used to build and display the flow recommendations electronically, in real-time. When a flow component was proposed, its magnitude, duration and timing were entered into text fields. Plots in HEC RPT update automatically with new entries, which allowed the groups to review and revise their recommendations.

A strength of HEC RPT is its ability to display and navigate hydrologic data sets. For the Willamette, scientists imported data to HEC RPT that showed how the river has been managed since construction of the dams, as well as how the river would have

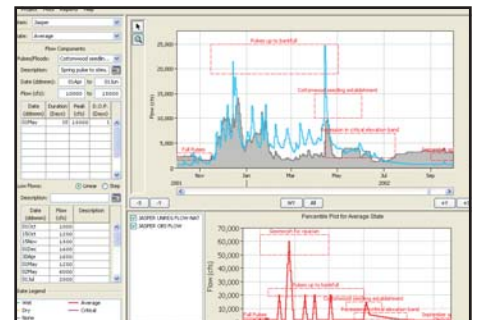
flowed if there were no reservoirs.

A final step in the workshop was to unify the recommendations of the separate groups. HEC RPT helped with this process through its merging feature, which allowed the recommendations to be brought into the same project and plotted together.

“RPT helped us to develop, visualize and evaluate complex flow regimes. It also made it easy to document the scientific basis of our flow recommendations, which has had continued benefits as we progress from recommendations to implementation for the Middle and Coast forks,” said Dr. Leslie Bach, the director of Freshwater Programs for the Oregon chapter of The Nature Conservancy.

HEC RPT is available free of charge at <http://www.nature.org/initiatives/freshwater/conservationtools/hecrpt.html>.

Development of HEC RPT was sponsored by the Hydrologic Engineering Center, Portland District and The Nature Conservancy in support of the Sustainable Rivers Project. Sustainable Rivers is an ongoing nationwide partnership between the Corps and The Nature Conservancy to improve the rivers by changing the operations of Corps dams, while maintaining or enhancing project benefits.



This figure shows the main interface of HEC RPT with results from the Willamette River flows workshop.