

## PERFORMANCE MEASURE INFORMATION SHEET #26

### LOWER COLUMBIA RIVER: RECREATION

Objective / Location	Performance Measure	Units	Description	MSIC
Recreation/Lower Columbia River	Access Days	# access days by activity by region	Sum of # days river flows are within the preferred ranges for shore-based and water-based activities	7 days

### Description

Flows in the lower Columbia River are a function of both flows out of Arrow Reservoir past Hugh Keenleyside Dam (HLK) and the Kootenay system past Brilliant Dam (BRD). Large and sudden changes in river flow have been noted to have detrimental effects on recreational interests, such as boat navigation and stranding, and safe access to shorelines.

Recreation access and associated benefits are important in lower Columbia River. Local communities benefit from improvements to the quality and diversity of recreation and tourism experiences through a greater quality of life, as well as through local economic development benefits that result from increased usage. A number of key factors that affect recreational quality and use include:

- Diversity and abundance of fish and wildlife, since many recreational activities are focused on enjoyment of these natural resources
- Ability to safely access the water or shorelines for water-based and shore-based activities
- Visual quality of viewscapes

During the Columbia WUP process, concern was expressed about daily flow fluctuations in the lower Columbia River, where flows can change dramatically from day to day or week to week. Due to the influence of the Kootenay River system and lack of control over flow changes (due to the constraints of the Columbia River Treaty), a modelling approach to capture these interests was not developed during the Columbia WUP process. It was agreed that boat access and shoreline access would capture most of the recreational interests in the lower Columbia River. For boat access, the Recreation Technical Subcommittee identified preferred flows over the recreation season that would provide "good opportunity" for a broad range of interests, including access via boat ramps, usability of boat ramps and quality of boating within that range of river flows. The boat access measure was not tied directly to physical structures (i.e., boat ramps). The shoreline access measure was defined around a range of flows that constituted "good opportunity" for shore-based activities, with activities decreasing in frequency when the flow is above or below this range.

### Performance Measures

The preferred range of river flows were developed based on critical water levels for viewshed quality, shoreline use, boat access and swimming, and mixed recreational use in the City of Trail (RL&L 2001, G. DeRosa pers. comm.<sup>1</sup>) The following table summarizes the flow levels highlighted in the RL&L report for the lower Columbia River.

<sup>1</sup> Trail Councillor Gord DeRosa has stated the City of Trail's preference for elevations are in the range of 404.9 and 408.1 metres for a variety of recreational and non-recreational (e.g., ambulance access) uses. In terms of flows,

### Preferred Flow Ranges for Lower Columbia River

Activity	Lower (cfs)	Upper (cfs)
Swimming	78 035	99 327
Sightseeing	14 195	102 823
Shore-based angling	60 309	99 327
Motor boating	70 902	156 035
Non-motorized boating	70 902	102 823
Boat-based angling <sup>2</sup>	40 000	60 000

Based on these preferred flow ranges, a PM was developed for "boat access" to cover use of all boats on the river (motorized and non-motorized), including boat-based angling which occurs primarily during the June-August period. The PM definition for "shore-based access" overlaps with shore-based angling, and suggests that flows below the lower cut-off for swimming (78305 cfs) are adequate.

The primary seasons of water- and shore-based activities were modified from that used during the WUP based on feedback from local user groups. The seasons are defined as follows:

#### NTS PM Definitions

Area	Measure	Dates	Critical Flow Zone
Lower Columbia River	Boat Access Days	1 May to 15 Sep	# days HLK + BRD flow between 40 000 and 102 823 cfs
	Shoreline Access Days	1 May to 30 Oct	# days HLK + BRD flow between 60 309 and 99 327 cfs

### Calculations

For each scenario:

1. Assemble the simulated results for total Arrow discharges (HLK) and average daily Brilliant (BRD) flows over 60 years (1940-2000; Figure 1).
2. Interpolate month-end HYSIM data to daily flows.
3. Count the number of days over the defined recreation season for each year that the total river flows from HLK and BRD fall within the preferred ranges for boat access and shoreline access.
4. Summarize all statistics (Figures 2 and 3).

### Key Assumptions and Uncertainties

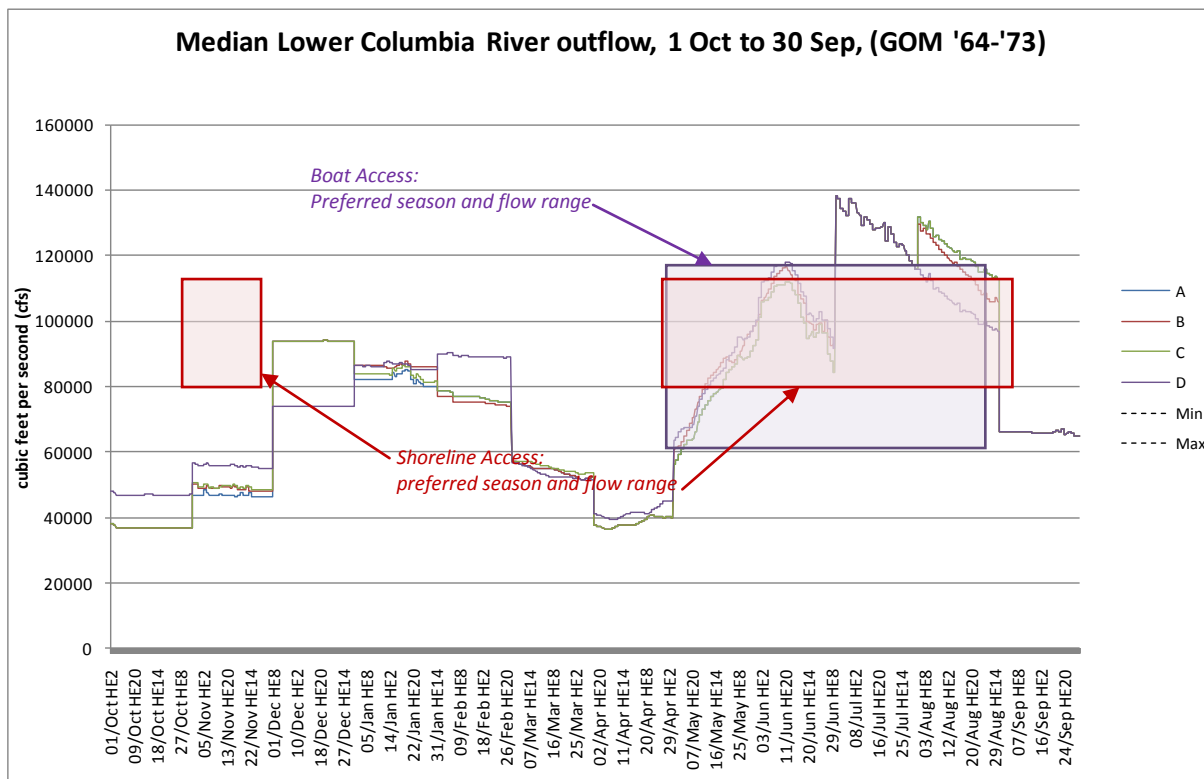
- Each scenario is simulated using the same set of system constraints, input assumptions (e.g., load forecasts) and historic basin inflows (1940 – 2000).
- Assumes that there is minimal recreational use outside the defined recreation season.

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these correspond to 1841cms (65 000cfs) to 3540cms (125 000cfs), according to information in the Indian Eddy Marina Development Project Review (BC Hydro).

<sup>2</sup> Preferred flow ranges for boat-based angling (i.e., pool formation) have been added for the NTS analysis based on input from members of the West Kootenay Fly Fishers Association.

- Assumes that the preferred season and elevations are accurate and are capturing the essence of access issues for boating and shoreline use.



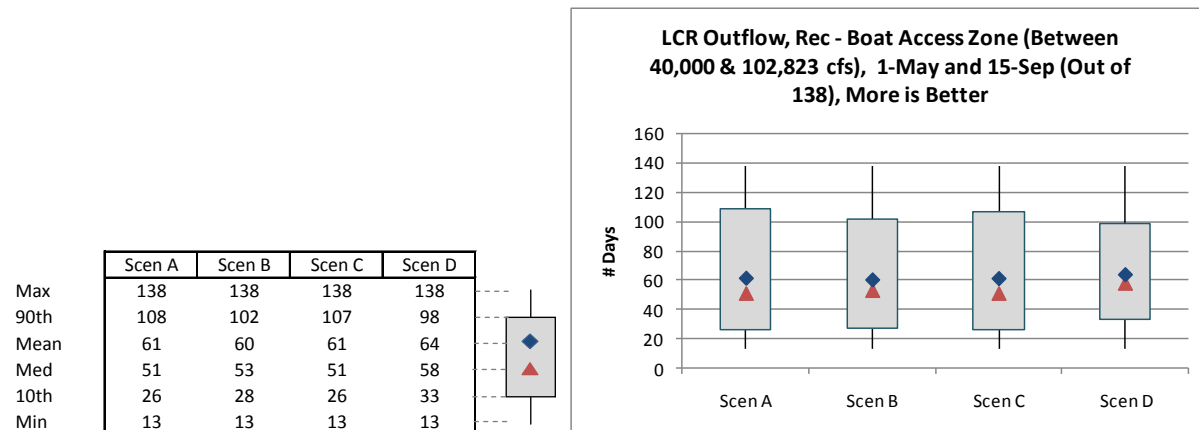
**Figure 1. GOM Simulated Lower Columbia River Flows. Median over 10 years showing the preferred ranges for recreation**

**Results**

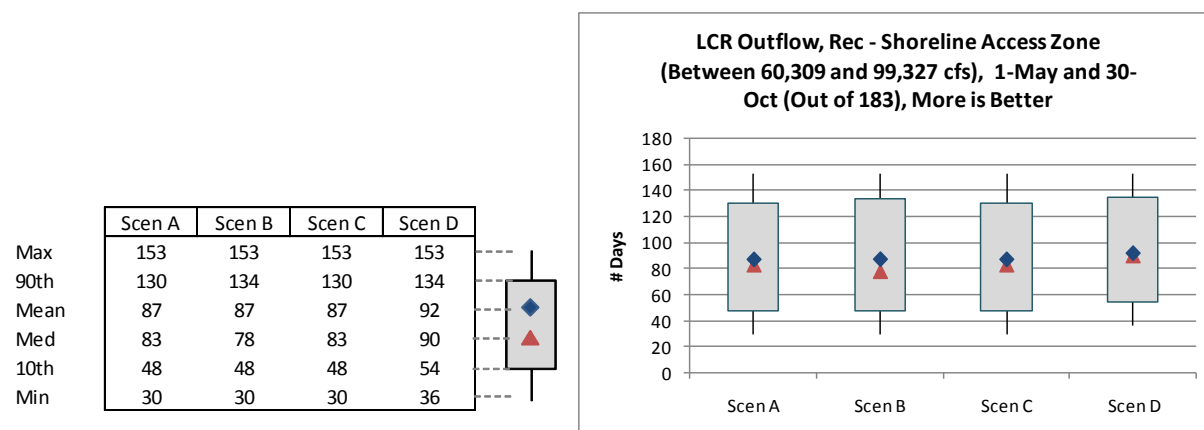
When considering the mean and median statistics, none of the scenarios perform significantly better for boat access to the lower Columbia River. However, when considering the 90<sup>th</sup> percentile, Scenario A (4.5 MAF) performs significantly better than the other scenarios, particularly scenario D (no NTS), in providing benefits to boat-based recreation on the river.

For shoreline access, all statistics point toward similar performance across all four scenarios, with the exception of the median result which shows better performance for Scenario D relative to Scenario B.

**Figure 2. Boat Access Days – HYSIM Results for all NTS scenarios**



**Figure 3. Shoreline Access Days – HYSIM Results for all NTS scenarios**



**References**

RL&L Environmental Services Ltd. 2001. Water Use Plans – Environmental information review and data gap analysis. Volumes 1 & 2. Prepared for BC Hydro, Burnaby by RL&L Environmental Services in association with Robertson Environmental Services Ltd., Pandion Ecological Research Ltd., Bruce Haggerstone Landscape Architect, Pomeroy & Neil Consulting Ltd. and DVH Consulting. RL&L Report No. 858V1-F.