PERFORMANCE MEASURE INFORMATION SHEET # 2

KINBASKET RESERVOIR: RECREATION

Objective / Location	Performance Measure	Units	Description	MSIC
Recreation/Kinbasket Reservoir	Access Days	# access days by activity by region	Sum of # days reservoir elevations are within the preferred ranges for shore-based and water-based activities	7 days

Description

Kinbasket Reservoir is considered to have high wilderness and scenic values, and supports a number of key sportfish species (bull trout, rainbow trout, kokanee). Fishing is the main recreational activity on the reservoir, with the majority of fishing activity occurring within about 15 km of launch points due, in part, to navigational concerns on the reservoir. Other activities include wildlife viewing, camping, picnicking, outfitting, cottage use, hiking and nature study. Although winter use of the reservoir is light, snowmobiling, ice fishing and ice sailing activity is increasing. While issues such as debris accumulation are being addressed by BC Hydro through a large-scale debris removal program, reservoir water levels continue to be a concern to local users. A new ramp at Bush Harbour was recently constructed by BC Hydro as part of its Water License Requirements Program, and further work is scheduled to occur at the Valemount Marina in 2011.

Recreation access and associated benefits are important in Kinbasket Reservoir. 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 (appearance of the reservoir related to avoidance of exposed mudflats/dust and exposed standing debris)
- Avoidance of navigational hazards

During the Columbia WUP process, it was agreed that boat access and shoreline access would capture most recreational interests. For boat access, the Recreation Technical Subcommittee identified preferred elevations 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 elevations. 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 elevations that constituted "good opportunity" for shore-based activities, with activities decreasing in frequency when the water is above or below this elevational zone. Again, this measure was not tied to site-specific elevation issues. The elevation zones were developed based on critical water levels for viewshed quality, shore-based activities and water-based activities, as summarized in RL&L (2001).

Performance Measures

For the purposes of the NTS analysis, preferences for reservoir water levels and seasons of use for recreational activities were modified based on input from Kinbasket community members. The definitions for the performance measures were changed to better reflect the nature of key recreational activities in the Canoe and Columbia reaches, which is driven largely by the natural topography of the north and south ends of Kinbasket Reservoir. The shoreline of the Canoe Reach is largely steep sided except in the more northern end, which limits the amount of shore-based recreation (K. Mortensen, pers. comm.). Activities focus primarily on hiking, camping and picnicking, and opportunities appears to be constrained more by availability of suitable flat terrain than reservoir water levels (K. Mortensen, pers. comm.). Recreation pursuits focuses primarily on water-based activities, which can occur as early as April and as late as end of October depending on weather conditions in any given year. The preferred elevation range is driven largely by what's "good" for boating quality, fishing, viewshed quality and boat access to the reservoir.

In the Columbia Reach, low reservoir water levels can cause much of the reach to be essentially dry for at least three months of the year, primarily during the spring and early summer. At higher water levels, the area offers a broad range of both water-based and shore-based recreational opportunities. Boat-based activities can extend from early May (e.g., bear hunting) through to snow fall (e.g., burbot fishing) (R. Priest, pers. comm.). For shoreline activities, there is a preference for reservoir water levels to remain below full pool to minimize re-floating of debris that remains stranded at the higher elevations and provide for more desirable areas for shore activities (R. Priest, pers. comm.).

NTS PM Definitions

Area	Measure	Dates	Critical Elevation Zone
Canoe Reach	Water-based recreational activity	01 Apr to 31 Oct	# days between 2404 – 2475 ft
Columbia Reach	Water-based recreational activity	01 May to 31 Oct	# days between 2375 – 2475 ft
	Shore-based recreational activity	01 May to 30 Sept	# days between 2444 – 2473 ft

Calculations

For each scenario:

1. Assemble the simulated results for month-end reservoir elevations over 60 years (1940-2000; Figure 1).
2. Count the number of days over the defined recreation seasons each year that the reservoir water levels fall within the preferred elevation ranges for water-based and shore-based activities.
3. Summarize all statistics (Figures 2-4).

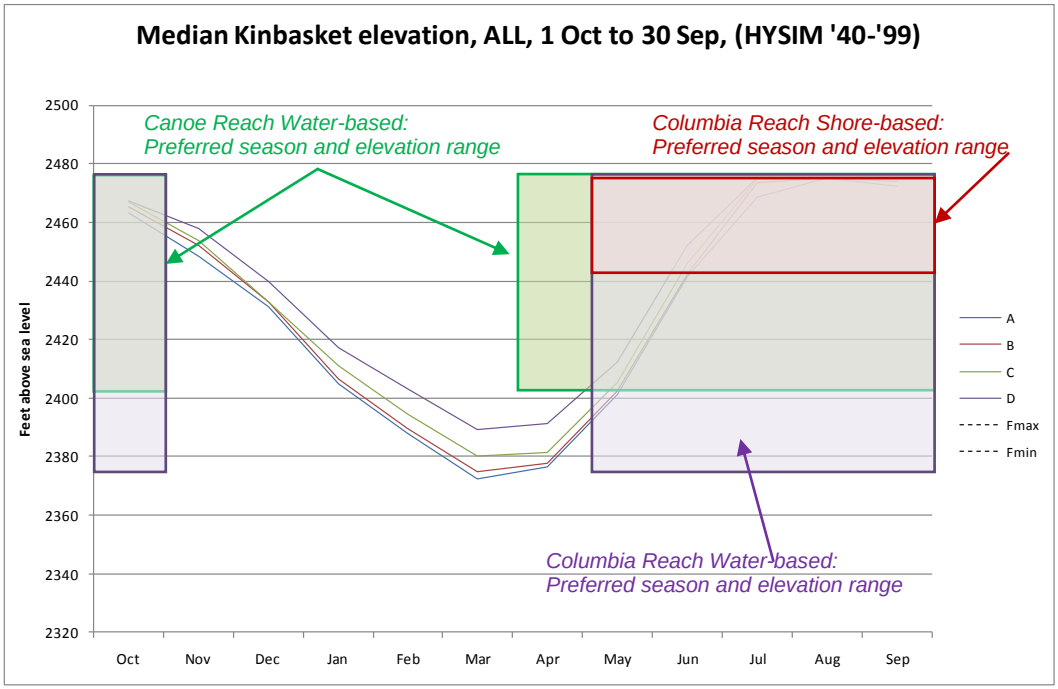


Figure 1. HYSIM Simulated Kinbasket Reservoir elevations. Median over 60 years showing the preferred seasons and elevation ranges for recreation

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
- Assumes that the preferred season and elevations are accurate

Results

Canoe Reach

The "with NTS" scenarios would provide very similar opportunities for water-based recreation in the Canoe Reach of Kinbasket Reservoir. However, Scenario D (no NTS) would provide the greatest opportunity as it would keep reservoir water levels higher throughout the recreation season than Scenarios A, B and C (Figure 2a).

Columbia Reach

Modeling results for water-based recreation in the Columbia Reach of Kinbasket Reservoir are very similar to those for Canoe Reach, where Scenario D would generally perform better than the "with NTS" scenarios, which all perform very similarly.

On average, all of the scenarios would perform similarly for shore-based recreation in the Columbia Reach. The only significant difference is between the Scenarios A and D during the outlier years, when one would out perform the other (10^{th} and 90^{th} percentiles).

Figure 2. Canoe Reach, Water-based Recreation Days – HYSIM Results for all NTS scenarios

	Scen A	Scen B	Scen C	Scen D
Max	194	194	197	214
90th	172	171	173	201
Mean	150	151	155	168
Med	151	152	155	165
10th	125	128	132	143
Min	108	95	108	128

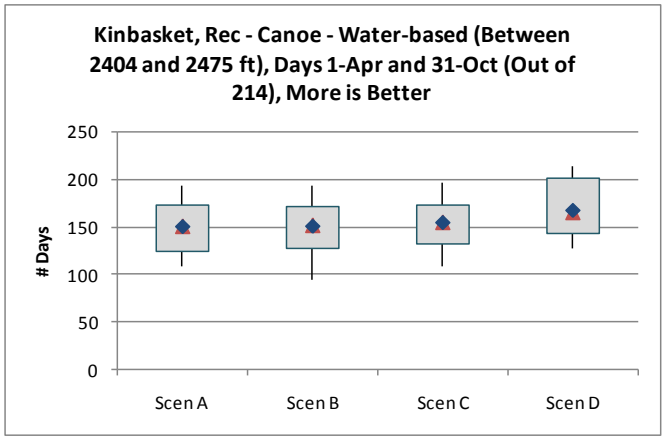


Figure 3. Columbia Reach, Water-based Recreation Days – HYSIM Results for all NTS scenarios

	Scen A	Scen B	Scen C	Scen D
Max	184	184	184	184
90th	184	184	184	184
Mean	174	175	176	181
Med	184	184	184	184
10th	148	150	150	170
Min	135	134	135	149

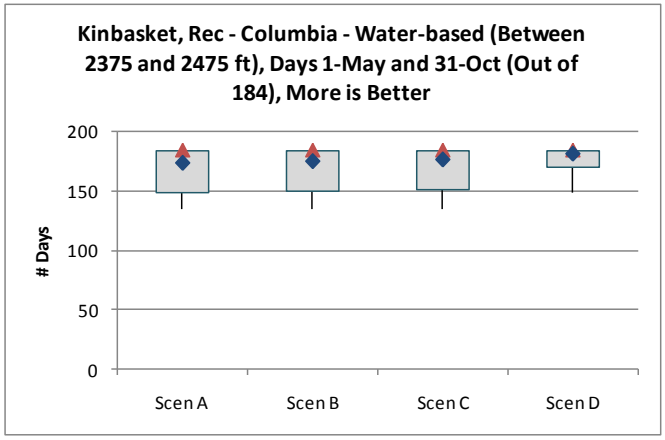
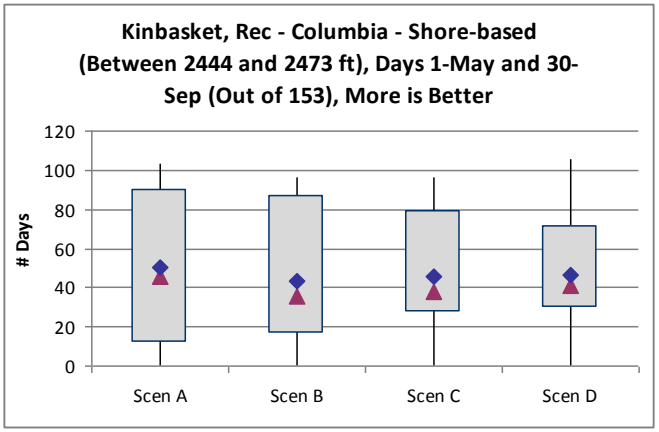


Figure 4. Columbia Reach, Shore-based Recreation Days – HYSIM Results for all NTS scenarios

	Scen A	Scen B	Scen C	Scen D
Max	103	96	96	105
90th	90	87	79	71
Mean	50	44	45	46
Med	46	36	38	41
10th	12	16	27	30
Min	-	-	-	-



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.