

Alberta Desktop Method

Ecological Flow Science Advisory Board
July 16, 2013

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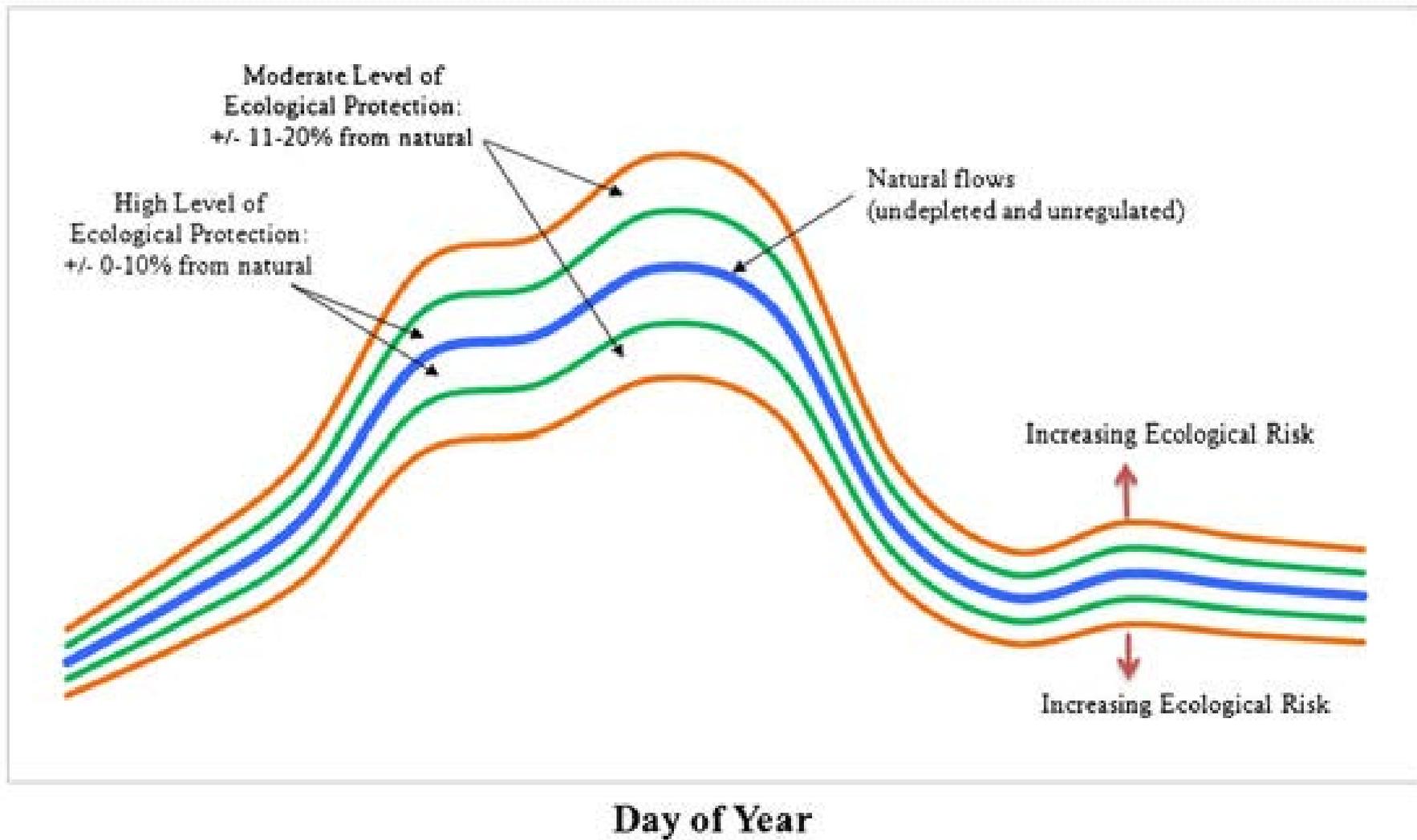
Background

- Locke and Paul 2011
- Based on results of site-specific studies in Alberta and literature review of other studies (in Canada, US and world) and riverine ecology
- Essentially a version of the Presumptive Standard Approach (Richter et al. 2012)

Simple Concept

- Natural hydrograph should be followed as template to capture the five aspects of flows
 - Magnitude, timing, duration, frequency and rate of change
- Percent-of-flow is easiest way to maintain all five aspects, including intra- and inter-annual variability
- Easier to understand than frequency-based standards or statistical targets
- Sustainable Boundary Approach
 - Allows for some deviation from the natural hydrograph
 - <10% for high level of ecological protection
 - <20% for moderate level of ecological protection

River Flow



Alberta Method

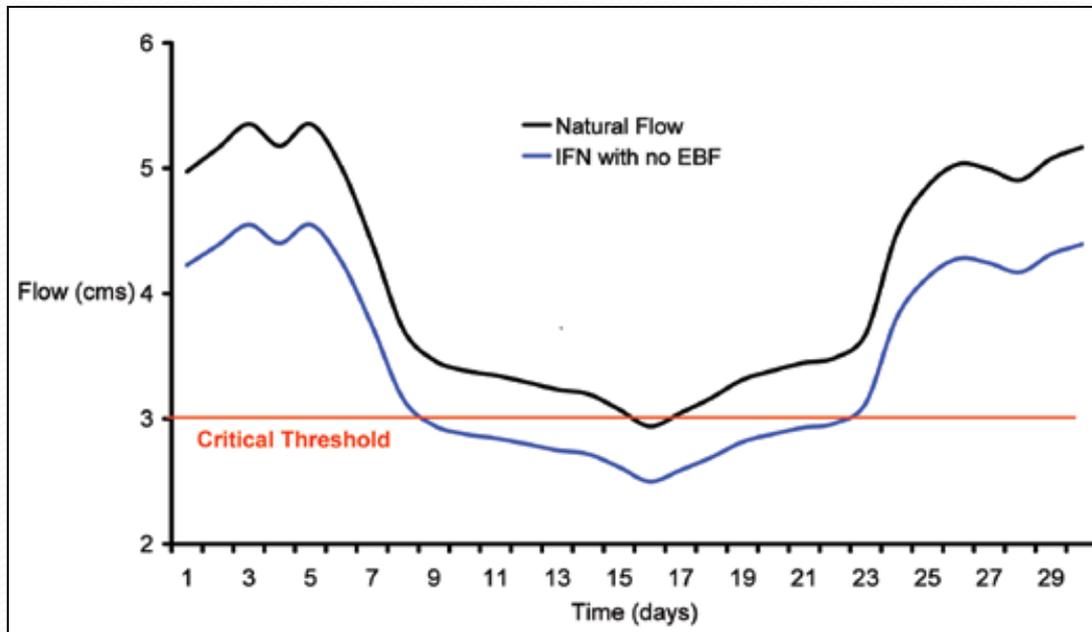
- Requires only hydrologic data
- Recommendation consists of two components
 - Percent-of-flow (POF) – same as percent flow-by concept we've already discussed
 - Ecosystem Base Flow (EBF) – a low-flow cut-off during low flow periods

Percent of Flow

- A reduction of the flow for a given time step
- Reduction is the cumulative reduction at the point of interest
- Reduction is from the natural flow
- Time step would be daily for most planning models
 - For peaking hydro, time step might be hours or minutes
- Alberta uses 15% reduction (i.e., 85% flow-by)

Ecosystem Base Flow

- During low flow periods, ecosystems are stressed
- Water withdrawals further stress the system by increasing the magnitude and duration of the bottleneck

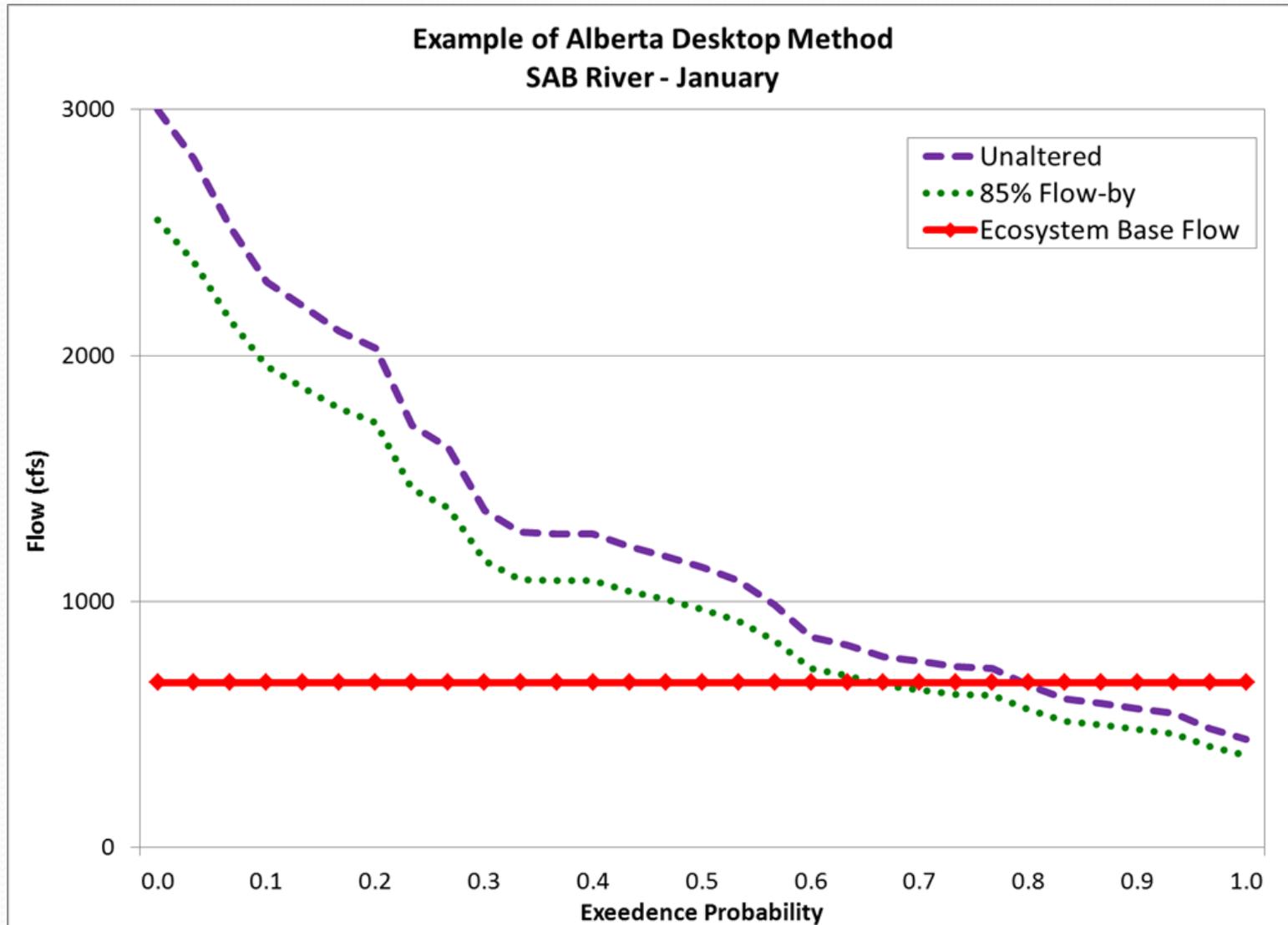


- Alberta uses 20th-percentile flow (80% exceedence flow)

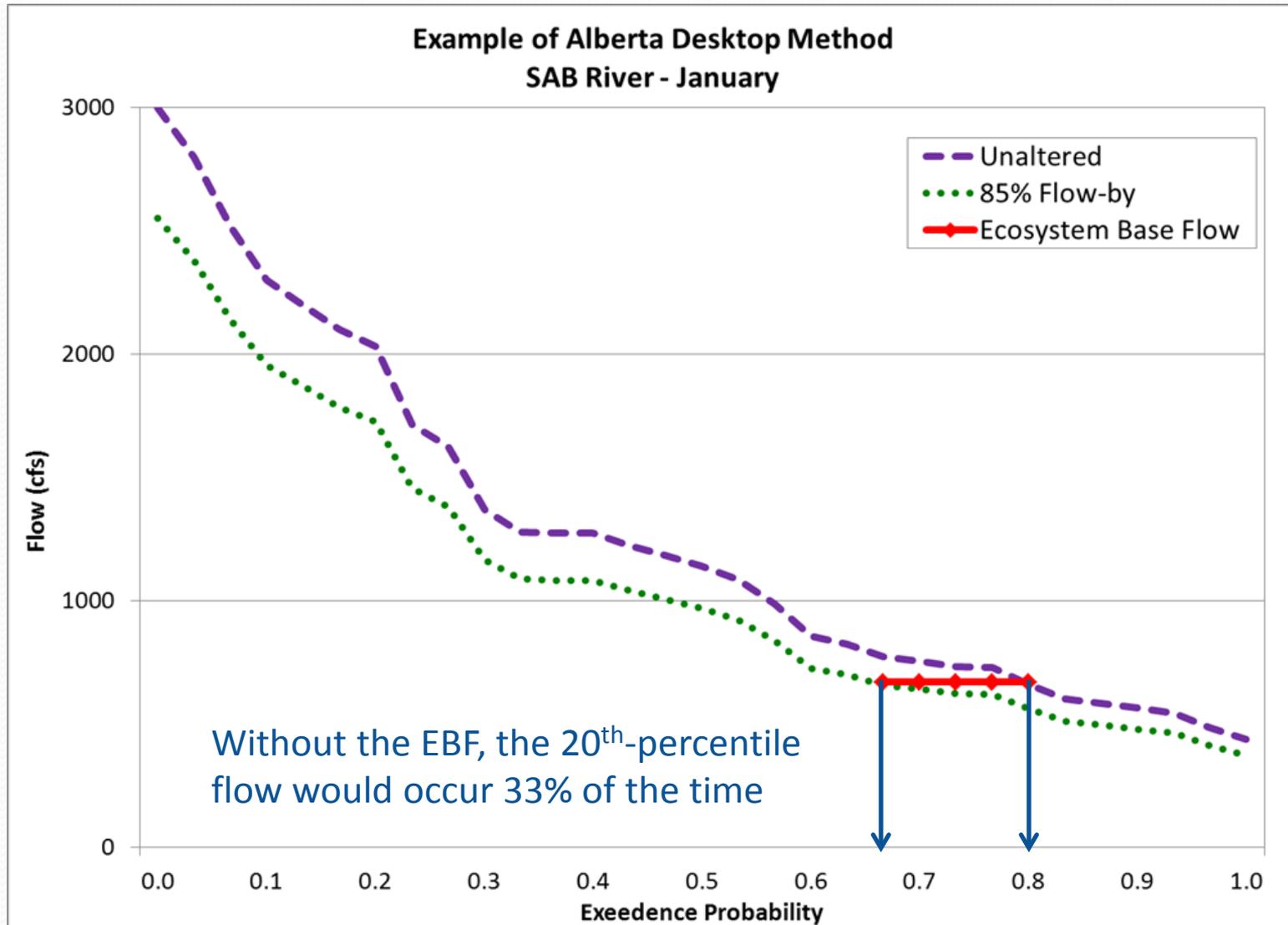
Combining Both Components

- Flow is the greater of either:
 - a) the 85% flow by or,
 - b) the lesser of either the natural flow or the 20 percentile flow
- Do this for each period of interest (i.e., month)
- The following graphs make it easier to understand

1. Calculate POF and EBF



2. Apply EBF to Critical Period



3. Combining POF and EBF

