

Down-Ramping Procedures for Controlled Flow Releases from Eklutna Lake to Eklutna River in 2021

- Purpose: to regulate the rate at which flows are reduced when adjusting flows between controlled flow releases.
- Objective: to prevent or minimize the potential stranding and/or trapping of fish in reaches of the Eklutna River subjected to flow reductions during the controlled flow releases for the Instream Flow and Geomorphology Sediment Transport studies.
- Criterion: apply 2 inch/hour down-ramping rate when making flow reductions based on Hunter (1992), who concluded that salmonid fry smaller than 50 mm in length are most vulnerable to stranding. As a result, he recommended that down-ramping rates be in the range of 1-2 inch per hour when fish are present. Fingerlings, smolts and adults are also vulnerable to stranding, but because of their greater mobility they can withstand down-ramping rates greater than that resulting in the stranding of fry.
- Derivation for Eklutna River:
 1. Historical flow records reviewed from Eklutna River gage below Eklutna Lake which indicated that –
 - when the flow is reduced from 150 cfs to 75 cfs, the stage drops 5 inches
 - when the flow is reduced from 75 cfs to 25 cfs, the stage drops 6.5 inches
 - when the flow is reduced from 25 cfs to zero, the stage drops 7.5 inches

2. Converting to an approximate 2 inch/hour down-ramping sequence from 150 cfs to 75 cfs requires the following four flow adjustments:
 - Hour 0 with existing flow at 150 cfs, make adjustment to 125 cfs
 - Hour 1 (existing flows at 125 cfs) – make adjustment to 105 cfs
 - Hour 2 (existing flows at 105 cfs) – make adjustment to 90 cfs
 - Hour 3 (existing flows at 90 cfs) – make adjustment to 75 cfs and hold for pre-determined time.

3. Converting to an approximate 2 inch/hour down-ramping sequence from 75 cfs to 25 cfs requires the following four flow adjustments:
 - Hour 0 with existing flow at 75 cfs, make adjustment to 55 cfs
 - Hour 1 (existing flows at 55 cfs) – make adjustment to 40 cfs
 - Hour 2 (existing flows at 40 cfs) – make adjustment to 31 cfs
 - Hour 3 (existing flows at 31 cfs) – make adjustment to 25 cfs and hold for pre-determined time.

4. Converting to an approximate 2 inch/hour down-ramping sequence from 25 cfs to 0 cfs requires the following five flow adjustments:
 - Hour 0 with existing flow at 25 cfs, make adjustment to 20 cfs
 - Hour 1 (existing flows at 20 cfs) – make adjustment to 15 cfs
 - Hour 2 (existing flows at 15 cfs) – make adjustment to 10 cfs
 - Hour 3 (existing flows at 10 cfs) – make adjustment to 5 cfs
 - Hour 4 (existing flows at 5 cfs) – make adjustment to 0 cfs