F Implementation of A.1.8.3 Guidelines and Policy Review

This appendix provides guidance on how to calculate the percentage volume depletion for proposed projects using methods consistent with those in the Volume Depletion Approach Study (Study). Recommendations for future reviews of the North Coast Instream Flow Policy (Policy) are also presented.

F.1 Example Calculation of Volume Depletion for a Proposed Project

In this Study, percentages of depletion in a study basin were prescribed in order to test the impact on habitat. In each study basin, diversion depletions were varied over a range from 1% to 10% of the seasonal unimpaired flow volume at the upper limit of anadromy (ULA). For future applicants using the A.1.8.3 guidelines, the percentage of depletion will be unknown and will need to be computed. Using methods consistent with this Study, we present an example of how to compute the percentage of volume depletion for a proposed project.

The guidelines in A.1.8.3 are intended to 'measure cumulative effects in percent change to seasonal flow volume'. The seasonal volume is computed over the period from November 1 through March 31.

The procedure to compute the percentage volume depletion for an example proposed project is given in Table F-1. We have assumed that, prior to computing the percentage volume depletion, the ULA and stream classification have been previously determined per Policy sections A.1.4 and A.1.6, respectively. We also assume that points of interest (POIs) have been selected per Policy section A.1.7. Figure F-1 shows the locations of a proposed project Point of Diversion (POD), three senior PODs, the ULA, and one downstream POI. The proposed project and senior water rights depicted here do not exist but are shown as a possible configuration of existing and proposed diversions.

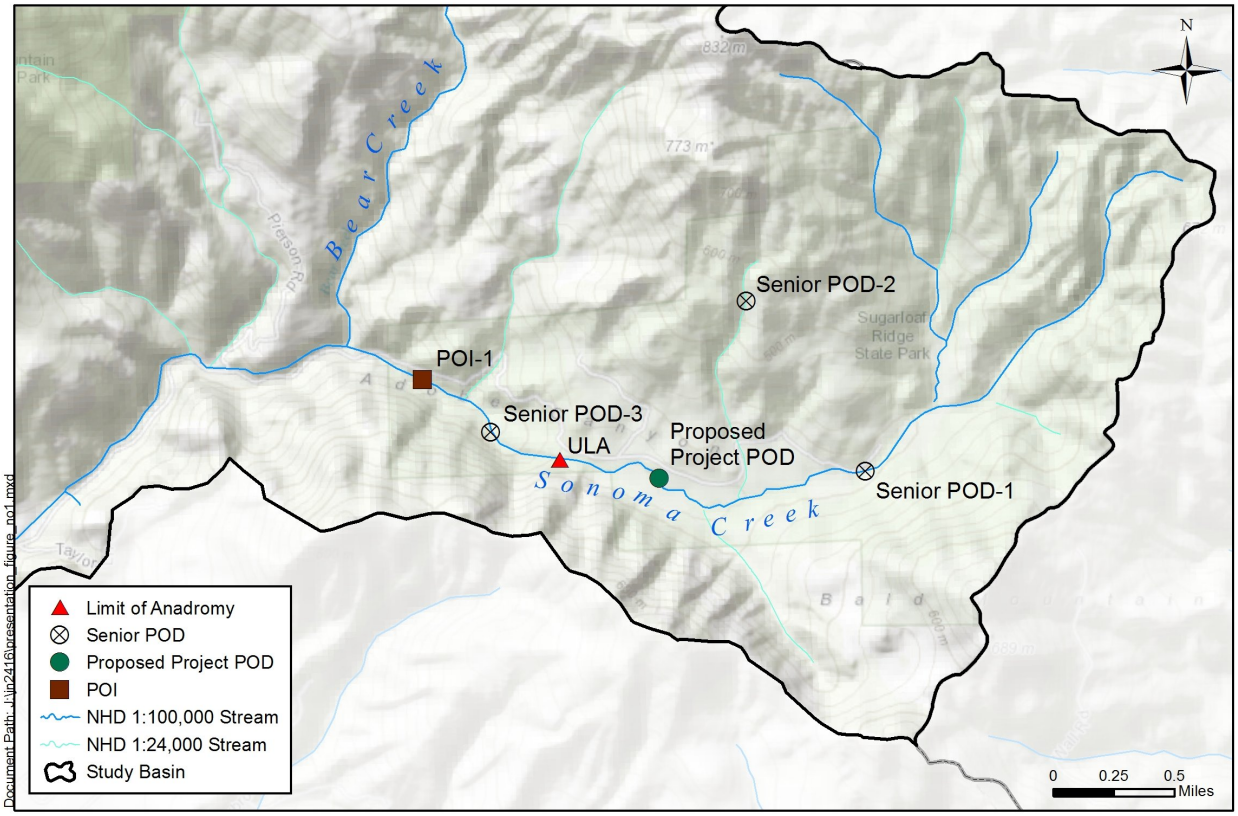

Fig. F-1 POD, POI and ULA Locations for Example Volume Depletion Calculation

Table F-1. Example Volume Depletion Calculation

Step	Example Explanation/Calculation
1. Identify the proposed project POD.	The proposed project POD is located on a Class II stream at the location shown on Figure F-1 (solid green circle).
2. Identify the maximum annual diversion volume proposed at the POD.	The proposed project will have a maximum annual diversion volume of 10 ac-ft.
3. Estimate the seasonal unimpaired flow at the ULA and at the POI. The season over which unimpaired flows are computed is November 1 through March 31.	Results from the HSPF models[1] have been used here to estimate the average unimpaired seasonal flow volume at the ULA and POI. Values here represent the average seasonal flow over the 10-year model period: 11/1-3/31 unimpaired flow volume at ULA = 760 ac-ft 11/1-3/31 unimpaired flow volume at POI-1 = 1,000 ac-ft
4. Locate all senior projects and determine the senior water right demand during the seasonal runoff period from November 1 through March 31. Information on senior water rights may be obtained from the State Water Board's eWRIMS database. (*www.waterboards.ca.gov/ewrims)* Applicants should compute the senior demand using the face value or maximum annual use limitation of each water right that may contribute to depletions of the seasonal unimpaired flow. Assumptions should be conservative, following the guidelines and exceptions in Policy section B.2.1.4. The season for considering exceptions under section B.2.1.4 is the period from November 1 through March 31.	We have assumed the following for the senior water rights: POD-1: Diversion to storage; maximum annual use of 8 ac-ft; diversion season of 10/1-3/31 POD-2: Diversion to storage; maximum annual use of 12 ac-ft; diversion season of 11/1-3/31 POD-3: Direct diversion; maximum withdrawal rate of 0.085 cfs; year-round diversions Senior water right demands are calculated as follows: POD-1: Senior demand during the seasonal period is 8 ac-ft. Even though the POD's season of diversion begins on October 1, the maximum annual use should be assumed to occur between November 1 and March 31. POD-2: Senior demand during the seasonal period is 12 ac-ft. POD-3: Senior demand is calculated by applying the direct diversion withdrawal rate to the five-month seasonal period from November 1 through March 31. At a rate of 0.085 cfs for 5 months (150 days), the total senior diversion in the seasonal period is 25 ac-ft.
5. Compute the total seasonal senior diversions upstream of the ULA and POIs.	At ULA, upstream senior diversions = seasonal diversions at POD-1 plus POD-2 8 ac-ft + 12 ac-ft = 20 ac-ft At POI-1, upstream senior diversions = seasonal diversions at POD-1 plus POD-2 plus POD-3 8 ac-ft + 12 ac-ft + 25 ac-ft = 45 ac-ft
6. Add the diversion volume of the proposed project to the senior diversions at the ULA and POI.	Seasonal diversions at ULA = 20 ac-ft + 10 ac-ft = 30 ac-ft Seasonal diversions at POI-1 = 45 ac-ft + 10 ac-ft = 55 ac-ft
7. Compute the volume depletion: divide seasonal diversions at the ULA or POI by the seasonal unimpaired flow at that point.	Percentage volume depletion at ULA = 30 ac-ft / 760 ac-ft = 3.9% Percentage volume depletion at POI-1 = 55 ac-ft / 1,000 ac-ft = 5.5%
8. Use the flowchart in Figure 6-7 to determine the appropriate guidelines. If a volume depletion is computed at multiple POIs, the higher volume depletion must be used to determine the appropriate guidelines.	The higher volume depletion of 5.5% at POI-1 is used to determine the appropriate guidelines. For a Class II stream with volume depletion between 5% and 10%, there are three options illustrated in Figure 6-7. The applicant may move forward using the guidelines from this Study (Option 3: No Diversion Season; Regionally Protective MBF from §2.2.1.2; and February Median MCD). If the applicant wants to use different diversion criteria, Option 1 or 2 may be pursued.

[1] These results are from a precipitation-based streamflow model developed for this Study; applicants may use other methods such as adjustment of gaged streamflow records.