

Action name: Sediment Management Plan **Prerequisite Actions:** none

Action Description:

Develop a sediment management plan to include rate of sediment accumulation in impoundment, project effects on bed-load transport and determination of downstream bank stability.

Applicable Hydro Projects/Developments:

Bryson (2601), Dillsboro (2602), Franklin (2603), Mission (2619), Tuckasegee (Little Glenville-2686), Nantahala (2692), and White Oak Creek and Dicks Creek impoundments.

I. Objective

Develop a sediment management plan for the respective project impoundments to include sediment accumulation in the impoundment, do literature survey concerning bed load transport in relation to impoundment filling, and determine downstream bank stability. Bank stability in bypass reaches will be done in conjunction with flow studies (Fish Instream Flow Study).

II. Basis

The bases for this study are contained in 18CFR4.51 and 18CFR4.61 under basic information filing requirements relative to descriptions of project-related issues.

III. Geographic and Temporal Scope

Bathymetric measurements will be conducted in the project impoundments sometime during the period June-September) using the same protocol used in the Consultation Report. During the summer of 2001, cross sections for bank stability evaluation will be selected and established in mutually agreed upon representative sections below the project dam. Bank stability evaluation in bypass reaches will be conducted as the reaches and flows are identified in the flow study (Fish Instream Flow Study).

IV. Approach and Analysis

Sediment accumulation in project impoundments is essentially a watershed issue so any sediment removal activities will be site-specific and will be conducted to alleviate or prevent a project-operational problem resulting from sediment accumulation in the vicinity of the intake. A formal sediment management plan will be developed based on researching and/or collecting information regarding sediment accumulation rates in run-of-river impoundments and then determining how to manage any sediment releases during periods of high flow in order to minimize effects on the biota. Sediment is a complex mixture of materials that are deposited differentially in an impoundment in response to decreasing water velocity. The larger materials are typically transported as bed load during higher flow events; the lighter materials are more transient and are prone to transport under relative low flow events. Accumulation of sediments in the impoundment is due to a combination of bed load materials and suspended solids. Information regarding the contribution of bed load transport can be useful in determining the rate of filling of an impoundment. However, data are extremely difficult to collect because bed load transport is highly dependent on high flows, which have a low recurrence rate. A literature survey will be conducted to identify studies

that might be useful in determining accumulation rates in impoundments due to bed load transport.

Bathymetric measurements will be used to determine the volume of sediment in the impoundment. Recent measurements in the consultation reports (Dillsboro, March 2000; Franklin, March 2000; Bryson, March 2000; Mission, March 2000; and West Fork Project (Tuckasegee), March 2000) will be evaluated as to their suitability for estimating sediment volume. If the maps are useable, then a bathymetric survey will be conducted in the summer of 2001 and results compared to the previous maps in order to determine the rate of sediment accumulation. Additionally, four transects will be established at points 1/5th, 2/5th, 3/5th, and 4/5th along the midline of the impoundment from the dam to the headwater at an elevation which corresponds to full pond. At each transect, cores will be taken from 4 equidistant points across the impoundment and the samples will be analyzed using standard sieve techniques. Results will be presented in a tabular format. New operating plans have been developed for Dicks Creek and White Oak Creek projects and will be discussed separately by the Technical Committee to determine the need for any studies.

Maintenance drawdowns

Existing impoundment drawdown practices related to project maintenance will be evaluated to determine appropriate drawdown procedures to minimize the downstream transport of sediments during draining. Additionally, a review of the history of drawdowns for these run-of-river projects will be conducted to determine dates of full drawdowns, duration of drawdown, reason(s) for drawdown (e.g., repairs, sediment discharge, etc.) and any resulting documented adverse impacts of drawdown (e.g., water quality violations, fish kills, etc.).

Bank stability

Bank erosion is a natural process. In order to evaluate if excessive bank erosion is occurring downstream of the project, an examination of historical USDA aerial photographs (spanning a sufficient temporal range to evaluate long-term bank stability) will be conducted to identify any potential areas of excessive bank erosion.

Bank stability in bypass sections

Bank stability in bypass sections will be evaluated during the flow study (Fish Instream Flow Study). Bank stability will be evaluated using guidance in Pfankuch, DL., 1975, "Stream reach inventory and channel stability evaluation."

V. Schedules and Required Conditions

The bathymetric surveys, particle size analyses, and stream bank stability studies will be conducted during 2001. The bathymetric surveys will be conducted by a consultant under Duke Power supervision. All profile locations will be GPS referenced.

VI. Results

The results of this study will be used to develop sediment management plans for the applicable projects.

VII. Participants

	Organization	Name	Phone #	E-Mail
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NP&L Supporting Consultant	TBD			
Other Participants	Friends of Lake Glenville	Doug Odell	(865) 690-1865	dodell@juno.com
	American Rivers	David Sligh	(423) 265-7505	dsligh@amrivers.org

VIII. List of References

- Dillsboro, First Stage Consultation Report, March 2000.
 Franklin, First Stage Consultation Report, March 2000.
 Bryson, First Stage Consultation Report, March 2000.
 Mission, First Stage Consultation Report, March 2000.
 Pfankuch, DL. 1975. Stream reach inventory and channel stability evaluation – A watershed management procedure. US Dept. Agric. RI-75-002. 26p.
 West Fork Project (Tuckasegee), First Stage Consultation Report, March 2000