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TO: Matilija Dam Working Groups
FROM: Paul Jenkin
DATE: November 6, 2002
SUBJECT: **Considerations for Coastal and Estuarine Studies
for the Matilija Dam Ecosystem Restoration Feasibility Study**

I have taken the time to review the coastal and H&H sections of the *Matilija Dam Ecosystem Restoration Feasibility Study F3 Report*⁵ and the *Draft H&H and Geotechnical Reports*¹. I also reviewed the *BEACON Report*², and the Department of Boating and Waterways (DBW) *California Beach Restoration Study*.³ Based on these reports I would like to offer the following observations:

1) Cobble and coarse sediments are critical to coastal processes

Throughout all of the reports, “beach sediment” is primarily assumed to be of sand-sized material. Indeed, sand is the Army Corps of Engineers standard for beach replenishment, and sand is the beachgoers preference for many, but not all, beach related recreational activities. However, the exclusive focus on sand can be misleading because it ignores many habitat benefits that could accrue from renewed coastal sediment supply from the restoration of our watersheds.

The Ventura River delta is largely composed of cobble and river rock that provides important habitat for marine plants and animals. This delta, which was in an accretion mode prior to the construction of dams in the watershed, is currently retreating as evidenced by the location of the WWII gun turrets upcoast of the river mouth. Recent studies suggest that parts of the shoreline are experiencing an erosion rate of around one foot per year (Noble⁴, 2000). This retreat, coupled with poorly planned development on the delta, has resulted in damaged infrastructure and the perceived need for solutions to “beach erosion” due to sediment deprivation.

It is significant that the Ventura River cobble delta is the City of Ventura’s most popular recreational beach, even though this area is not exclusively a “sandy beach”. A bike path travels up and down the coast, and connects with the Ventura River trail to Ojai. Surfers and windsurfers are regulars here, where consistent “point break” conditions provide almost daily opportunities to catch the waves and wind. Fishermen and clammers often find dinner in the rich intertidal cobble environment, and the estuary supports a variety of birds and wildlife for nature watchers. People are naturally drawn to this dynamic coastal area.

The reduced supply of cobble to the coast from this steep, highly erodible watershed has been a major contributor to local erosion problems, and should not be overlooked in the Matilija Dam Ecosystem Restoration Feasibility Study.

2) Coastal erosion at the river delta may be accelerated in coming decades

The F3 Report concludes that for future without project conditions: “*Elsewhere within the BEACON study area and particularly for unprotected beaches west of the Ventura River, it is*

anticipated that conditions will remain much as they are today.” This conclusion was drawn directly from the BEACON Report of 1989, and did not consider or reflect the fluvial analysis conducted by the H&H workgroup of the Matilija Dam Ecosystem Restoration Feasibility Study.

As the H&H studies suggest, watershed processes represent a continuum of sediment flux. The overall reduction in sedimentation from dams and debris basins alters the hydrologic properties of the watershed. As sediment supply has been diminished, so has the continuum of sediment to the coast. A proper view of the beaches recognizes them as connected to the upper watersheds via the rivers.

The H&H Report concludes that approximately 1.9 million cubic yards of sediment has eroded from the riverbed in the past 30 years. The majority of this material is coarse sediment that once formed braided channels in the main stem Ventura River. This suggests that a large quantity of river cobble has been transported downstream by “hungry water” (sediment starved river flows). Indeed, the Geotechnical studies estimate that Matilija Dam has trapped approximately 960,000 cubic yards of coarse material.

The H&H studies suggest that the rate of riverbed erosion will slow as the river reaches a new equilibrium state dominated by embedded channels. When this happens, the flux of coarse sediment to the coast will be further reduced due to reduction in this supply. ***Since Matilija Dam will remain an efficient trap for gravel and cobble for many decades if left in place, coastal erosion at the river delta may be accelerated in the near future.***

3) **Estuary and coastal habitat issues require further research**

Estuary and coastal habitats have been adversely impacted by the reduction in fluvial sediment supply. As one example, the ACOE levee at the rivermouth has become exposed to the littoral processes as the shoreline near the rivermouth has receded. The result is that the end of the levee now acts like a groin, causing an unnatural build up of sand on its up-coast side. This groin effect adversely affects the estuary by filling the open water with wind-born sand and altering the natural breaching cycles of the estuary. It simultaneously starves beaches immediately downcoast, impacting coastal development and habitat as evidenced in the erosion of the bike path and loss of dunes at Surfers Point. ***These and other impacts to estuary and coastal habitats should be investigated as part of this study.***

4) **Fluvial and littoral sediment budgets require further research**

In the F3 Report the sediment yield from the watershed was presented in acre-feet per year. This data was converted to cubic yards per year and compared to sediment budgets published in other references. The table below provides a comparison of the various estimations of fluvial and littoral sediment budgets:

	H&H baseline ¹	BEACON ²	DBW Study ³
	Fluvial estimates (coarse fraction) (cu yd/yr)	Sediment Budget (sand) (cu yd/yr)	Fluvial estimates (sand & gravel) (cu yd/yr)
Watershed - no dams	272,756	115,000	156,060
Watershed - 2 dams	176,400	80,000	102,000
Watershed - w/Casitas only	213,010		
Matilija Creek	61,129		44,400

These estimates vary considerably, and it is likely that the differences result from assumptions in the grain size fractions. For instance, the BEACON report considers only the beach compatible sand fraction, and not larger coarse material. Also, the H&H report recognizes the

uncertainty resulting from assumptions in the calculations, and states the need for further analysis of the coarse sediment load to determine the sediment budget for the watershed.

In light of the comments above regarding the importance of cobble and gravel in the vicinity of the Ventura river mouth, and the fact that the Matilija Creek watershed contributes a large percentage of this fraction to the watershed, it is clear that the F3 Report does not fully recognize the complex nature of the coastal environment within the project study area. **The F3 Report should recognize the full range of sediment sizes naturally occurring at the Ventura river mouth and their importance for both habitat and recreation.**

I also hope that these comments are useful in assessing the potential impacts and benefits from an ecosystem restoration project as the study progresses into the next phase.

Sincerely,

A. Paul Jenkin, M.S.

Cc: Federico Barajas, BOR
Jeff Pratt, Ventura County

References:

1. Hydrology, Hydraulics and Sediment Studies of Without-Project Conditions Matilija Dam Ecosystem Restoration Project, Ventura CA, US DEPARTMENT OF THE INTERIOR, US BUREAU OF RECLAMATION Draft Prepared by Blair Greimann, Mitchell Delcau, Kenneth Bullard, Edmund Andrews, Dan Levish, 2002. p 58
2. Noble, 1989, "Coastal Sand Management Plan, Santa Barbara / Ventura County Coastline", Prepared for BEACON, Beach Erosion Authority for Control Operations and Nourishment by Noble Consultants, Inc., Irvine, CA 92715.
3. California Department of Boating and Waterways and State Coastal Conservancy, *California Beach Restoration Study*. Sacramento, California. 2002. pp. 7-6, 7-40
4. Noble Consultants, "Surfers Point Park – Managed Plan for Shoreline Retreat", December 2000. p A-5
5. *Matilija Dam Ecosystem Restoration Feasibility Study, Ventura County, Ca Baseline Conditions Report, F3 Milestone*, US Army Corps Of Engineers, Los Angeles District, South Pacific Division, August 2002.