UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

JUL 6 2010

OFFICE OF THE
REGIONAL ADMINISTRATOR

Colonel Mark Toy
District Engineer, Los Angeles District
U.S. Army Corps of Engineers
P.O. Box 532711
Los Angeles, California 90053-2325

Dear Colonel Toy:

This letter transmits the Clean Water Act (CWA) jurisdictional determination for the Los Angeles River. On August 17, 2008, EPA's Assistant Administrator for Water designated the Los Angeles River as a "Special Case" as defined by the EPA-Corps 1989 Memorandum of Agreement (MOA) regarding coordination on matters of geographic jurisdiction. Pursuant to the MOA, designation of the "Special Case" made EPA responsible for determining the extent to which the Los Angeles River was protected as a "water of the United States." Specifically, EPA analyzed the river's status as a "Traditional Navigable Water," one of several categories of jurisdictional waters under the Act.

We conclude that the mainstem of the Los Angeles River is a "Traditional Navigable Water" from its origins at the confluence of Arroyo Calabasas and Bell Creek to San Pedro Bay at the Pacific Ocean, a distance of approximately 51 miles.

In reaching this conclusion, Region 9 and Headquarters staff considered a number of factors, including the ability of the Los Angeles River under current conditions of flow and depth to support navigation by watercraft; the history of navigation by watercraft on the river; the current commercial and recreational uses of the river; and plans for future development and use of the river which may affect its potential for commercial navigation. Available evidence on each of these factors indicates that the Los Angeles River mainstem possesses the physical characteristics and past, present, or future use for navigation consistent with a "Traditional Navigable Water." This analysis is summarized in the enclosed document, "Special Case Evaluation regarding the Status of the Los Angeles River, California, as a Traditional Navigable Water." Please let me know if you would like to receive the underlying data and analyses.

This report constitutes the position of the federal government on the CWA jurisdictional status of the mainstem of the Los Angeles River, and its transmittal concludes the "Special Case" process. If you have any questions, please contact me at (415) 947-8702 or Jason Brush, Chief of the Wetlands Office, at (415) 972-3483.

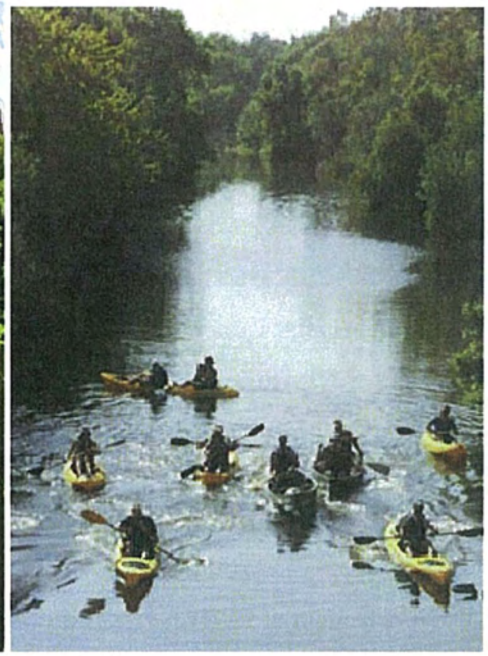
Sincerely,

Jared Blumenfeld
Administrator, EPA Region 9

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX

SPECIAL CASE EVALUATION REGARDING STATUS OF THE LOS ANGELES RIVER, CALIFORNIA, AS A TRADITIONAL NAVIGABLE WATER



July 1, 2010

Contents

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REGION IX

SPECIAL CASE EVALUATION REGARDING STATUS OF THE LOS ANGELES RIVER, CALIFORNIA, AS A TRADITIONAL NAVIGABLE WATER

July 1, 2010

Summary

This document compiles and evaluates evidence pertaining to an approximately 51-mile reach of the mainstem Los Angeles River, Los Angeles County, California, to support a determination of whether some or all of this reach is a "traditional navigable water" (TNW), and as such is a jurisdictional water of the United States under the Clean Water Act (CWA). This document does not address the jurisdictional status of the Los Angeles River under the other jurisdictional criteria set forth in 33 C.F.R. § 328.3(a)(2)-(7) and 40 C.F.R. § 230.3(s)(2)-(7). Analysis of evidence indicates the Los Angeles River mainstem possesses the physical characteristics and past, present, or future use for navigation consistent with a TNW.

Background

In response to a request for a jurisdictional determination on a tributary of the Los Angeles River, on March 20, 2008, the Los Angeles District of the U.S. Army Corps of Engineers (Corps) issued a Memorandum for the Chief, Regulatory Division, which concluded that a 1.75-mile reach of the Los Angeles River from the upstream limit of tidal influence (2.5 ft. mean sea level) to its estuary with the Pacific Ocean is a TNW.[1] Subsequently, in a Memorandum for the Record, dated June 4, 2008, the District Engineer amended the March TNW determination to include a 2-mile reach of the Los Angeles River within the Sepulveda Basin as a TNW, in addition to tidally-influenced portions of the river.[2]

[1] U.S. Army Corps of Engineers. 2008a. Determination of TNW Status of the Los Angeles River (File No. 2008-218-AJS), Memorandum for Chief, Regulatory Division, Los Angeles District, Corps of Engineers, March 20, 2008. 4 pp, w/enclosures.

[2] U.S. Army Corps of Engineers. 2008a. Memorandum for the Record: Determination of Traditionally Navigable Waters (TNW) on the Los Angeles River. Los Angeles District, Corps of Engineers, June 4, 2008. 4 pp.

Considered together the Corps concluded that approximately 3.75 miles of the approximate 51-mile length of the Los Angeles River is a TNW. The Corps did not make any determinations regarding the jurisdictional status of the other segments of the Los Angeles River.

On August 17, 2008, the Assistant Administrator for Water at the U.S. Environmental Protection Agency (EPA) issued a letter designating the Los Angeles River as a "Special Case" under the EPA-Corps coordination procedures established in the 1989 *Memorandum of Agreement Concerning the Determination of the Geographic Jurisdiction of the Section 404 Program and the Application of the Exemptions under Section 404(f) of the Clean Water Act.* On December 3, 2008, EPA affirmed that available evidence supported the Corps' June 4, 2008 determinations for the two segments of the river already evaluated, and provided that EPA would make the final navigability determination for remaining portions of the mainstem Los Angeles River for Clean Water Act purposes. This report analyzes the available evidence and finds that the entire mainstem Los Angeles River is a TNW susceptible to commercial navigation from its origin to the estuary at the Pacific Ocean, based on historical and current recreational use, flows, and plans for future development.

Geographic Scope of Evaluation

The relevant river segment for purposes of this TNW determination is the mainstem Los Angeles River from its estuary at the Pacific Ocean (33°118°11'14.04"W), upstream for a linear channel distance of approximately 51 miles to its origin at the confluences of Arroyo Calabasas and Bell Creek, in the City of Canoga Park (33°11'42.78"N, 118°36'06.81"W)(Figure 1).

Navigability [33 CFR 328.3(a)(1)]

Evaluation Criteria

This document evaluates evidence related to the past, present and potential future navigability of the 51-mile mainstem reach of the Los Angeles River. The relevant criteria come from the CWA, federal regulations at 33 C.F.R. § 328.3(a)(1) and 40 C.F.R. § 230.3(s)(1), relevant case law, and existing guidance, including the December 2, 2008 EPA and Department of the Army legal memorandum *Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell v. United States* (Rapanos Guidance). The Rapanos Guidance, in part, states that EPA and the Corps will assert jurisdiction over "traditional navigable waters" (*i.e.*, "(a)(1) Waters"), which include "[a]ll waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide," as set forth in 33 C.F.R. § 328.3(a)(1), and 40 C.F.R. § 230.3(s)(1).[3]

[3] The Rapanos Guidance further explains: The "(a)(1)" waters include all of the "navigable waters of the United States," defined in 33 C.F.R. Part 329 and numerous decisions of the federal courts, plus all other waters that are navigable-in-fact (*e.g.*, the Great Salt Lake, UT and Lake Minnetonka, MN). For purposes of CWA jurisdiction and this guidance, waters will be considered traditional navigable waters if:

- They are subject to Section 9 or 10 of the Rivers and Harbors Act; or

Applying the Rapanos Guidance, this navigability evaluation for the Los Angeles River focuses on several key types of evidence:

(1) Ability of the river under current conditions of flow and depth to support navigation by watercraft;

(2) History of navigation by watercraft on the Los Angeles River;

(3) The current commercial and recreational uses of the river; and

(4) Plans for future development and use of the river which may affect its potential for commercial navigation.

Information Evaluated

The Region has evaluated many sources of historical and recent information to assist in its TNW determination. To characterize the potential of the Los Angeles River to support commercial or recreational boating under current and foreseeable future conditions, we analyzed information on flow frequency and depth. EPA contracted with Tetra Tech to compile and analyze available evidence on flow frequency and flow depth at United States Geological Survey (USGS) and Los Angeles County Department of Public Works (LADPW) monitoring gages on the Los Angeles River.[4] We also collected historical and current information on recreational navigation and other uses of the river including access, from various sources that are publicly available on the Internet, as well as information submitted to EPA from the public. We evaluated information provided by the public concerning current and planned future uses of the Los Angeles River for navigation. Finally, we evaluated information received from the City of Los Angeles,

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- A federal court has determined that the waterbody is navigable-in-fact under federal law; or
- They are waters currently being used for commercial navigation, including commercial water-borne recreation (*e.g.*, boat rentals, guided fishing trips, water ski tournaments, etc.); or
- They have historically been used for commercial navigation, including commercial water-borne recreation; or
- They are susceptible to being used in the future for commercial navigation, including commercial water-borne recreation. Susceptibility for future use may be determined by examining a number of factors, including physical characteristics and capacity of the water (*e.g.*, size, depth, and flow velocity, etc.) to be used in commercial navigation, including commercial recreational navigation, and the likelihood of future commercial navigation or commercial water-borne recreation. Evidence of future commercial navigation use, including commercial water-borne recreation (*e.g.*, development plans, plans for water dependent events, etc.), must be clearly documented. Susceptibility to future commercial navigation, including commercial water-borne recreation, will not be supported when the evidence is insubstantial or speculative. Use of average flow statistics may not accurately represent streams with "flashy" flow characteristics. In such circumstances, daily gage data is more representative of flow characteristics. Rapanos Guidance at 5, fn 20.

[4]Memorandum, Regarding: *Los Angles River Analysis*, dated March 30, 2009, to Robert Leidy, EPA, Region 9, from Jon Butcher and Bobby Tucker, Tetra Tech, 16 pp. + appendices.

Board of Public Works, on the City's future plans for recreational access and navigation on the Los Angeles River.

Physical Characteristics

Watershed

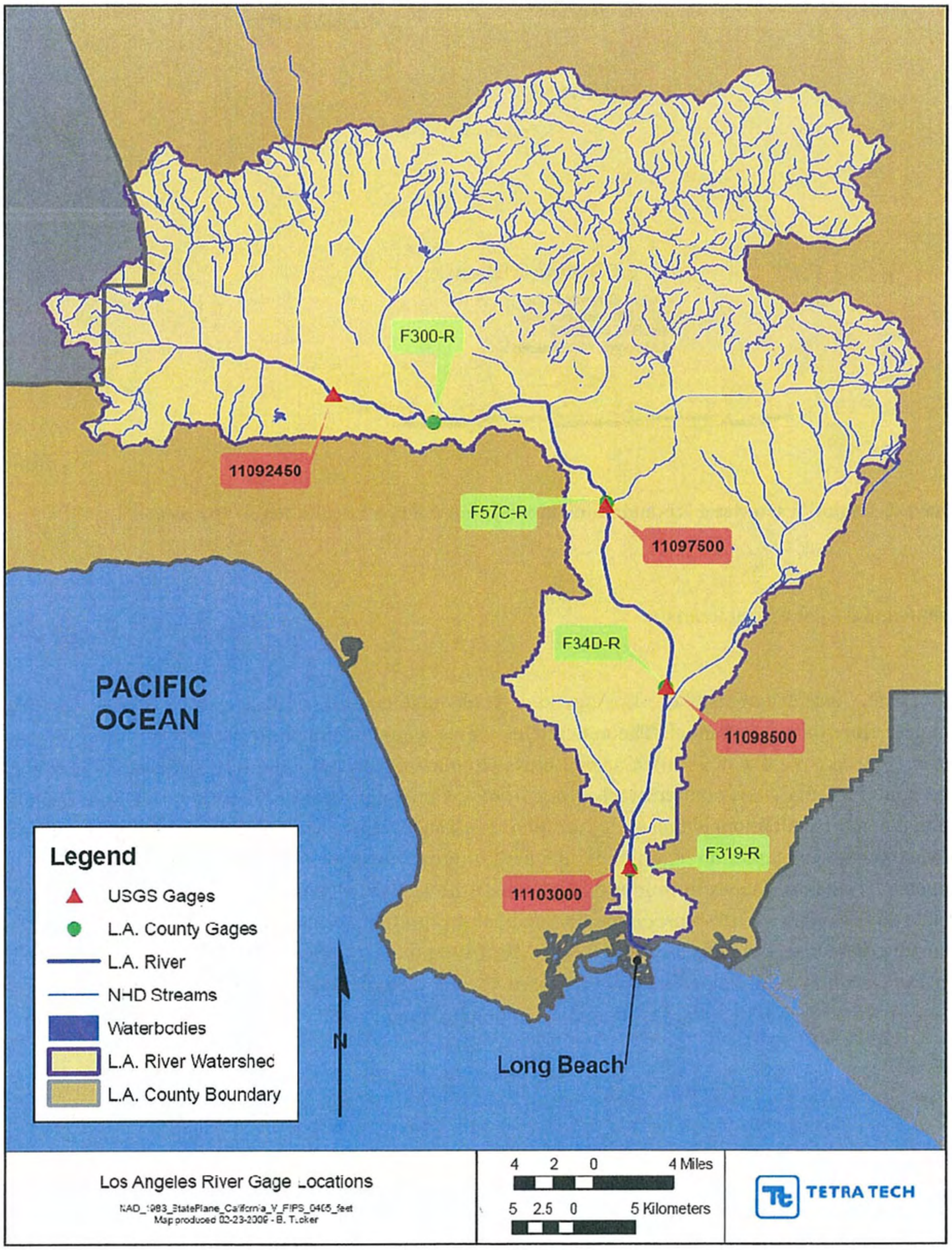
The 830 mi2 Los Angeles River watershed encompasses the northern slope of the Santa Monica Mountains, the Verdugo Hills, and the San Gabriel and Santa Susana Mountains (LACDPW 2006). The mainstem of the Los Angeles River begins at the confluence of Arroyo Calabasas and Bell Creek in the San Fernando Valley and flows approximately 51 miles to the Pacific Ocean at San Pedro Bay, between the City and Port of Long Beach (Figure 1).

Major tributaries to the Los Angeles River from its headwaters downstream to the Pacific Ocean include Browns Canyon, Aliso Canyon Wash, Bell Creek, Pacoima Wash, Tujunga Wash, Burbank Western Channel, Verdugo Channel, Arroyo Seco, Rio Hondo, and Compton Creek (EPA 2005). About 44% of the headwater portion of Los Angeles River watershed is classified as open space or forested, with about 200 mi2 consisting of mountainous terrain within the Los Angeles National Forest (Tetra Tech 2002). The remainder of the watershed consists of residential (36%), industrial (10%), commercial (7%), and agricultural (3%) land uses (Tetra Tech 2002). Almost the entire mainstem Los Angeles River is surrounded by urbanized land uses.

Annual rainfall within the watershed ranges from approximately 15.5 inches in downtown Los Angeles to 33 inches in the surrounding San Gabriel Mountains (LACDPW 2006). Seventy-five percent of precipitation falls between the months of November and March (LACDPW 2006). Mean monthly discharges for the Los Angeles River at Long Beach for the period 1929-1992 were greatest in January at 470 cubic feet per second (cfs), February (698 cfs), and March (640 cfs)(USGS Surface Water Data 2009). The lowest flows are during the months of June through October (USGS Surface Water Data 2009). Major floods have occurred on the Los Angeles River in 1815, 1825, 1914, 1934, and 1938 (LARMP 1996).

Point source discharges account for a significant portion of the dry weather surface flow in the Los Angeles River. There are currently six major, and 29 minor, permitted point source discharges to the Los Angeles River (Tetra Tech 2002). Three of these are major Publicly Owned Treatment Works (POTWs) that discharge water directly into the Los Angeles River: D.C. Tillman Waste Water Reclamation Plant (WWRP) (design capacity of 80 million gallons per day (mgd)); Los Angeles-Glendale WWRP (d.c. = 20 mgd); and the Burbank WWRP (d.c. = 9 mgd)(EPA 2005)(Figure 2). Of the six major permitted discharges the Tillman, Los Angeles-Glendale and Burbank POTWs account for over 80 percent of the major design discharge. During dry periods, point source discharges accounted for 60 to 100 percent of the total surface flow through the Los Angeles River (Tetra Tech 2002). Gauged tributary flows into the river accounted for an additional 20 to 40 percent of the dry weather base flow in the mainstem Los Angeles River (Tetra Tech 2002). As such, point source discharges are an important factor in determining the suitability of various river reaches for navigation, especially during typically dry-weather months (*i.e.*, April-October).

Figure 1. Flow Gage Location Map, Los Angeles River Watershed, California



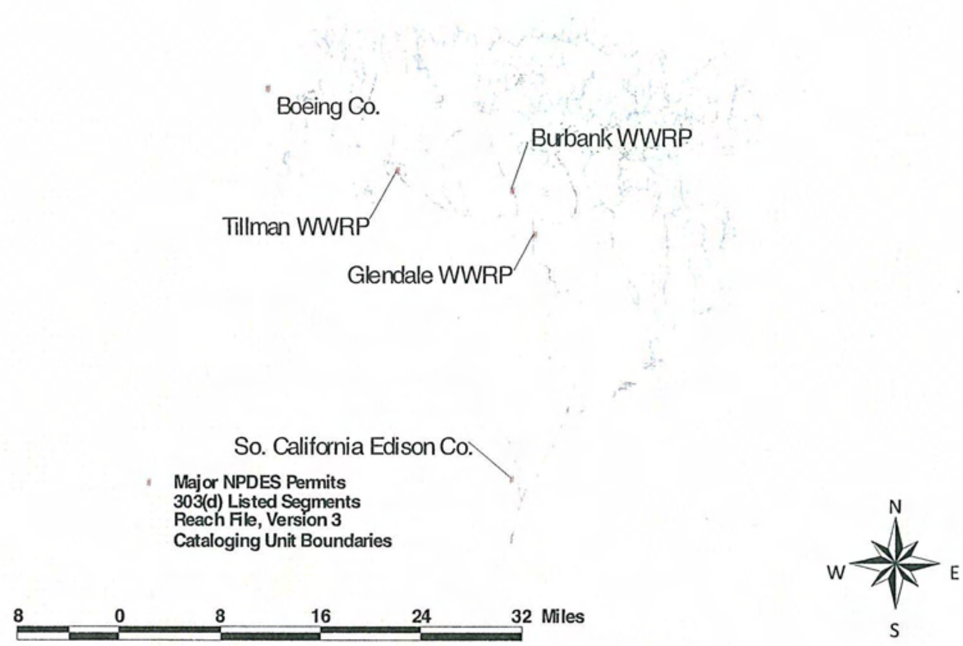


Figure 2. Major Wastewater Reclamation Plants within the Los Angeles River Watershed

Channel and Reach Characteristics

The entire length of the Los Angeles River is channelized, most of which is confined within a concrete flood control channel. The concrete channels were constructed primarily between the late 1930s and the 1950s (LACDPW 2006). Channel cross section geometry along the Los Angeles River is typically trapezoidal in the downstream reaches (*i.e.*, from Glendale Narrows downstream) and rectangular in upstream reaches, although there are exceptions. Channel cross sectional area generally decreases in a downstream to upstream direction along the length of the Los Angeles River (Tetra Tech 2002). The Los Angeles River has reaches with low flow channels, no low flow channels, and "natural" unlined channels (Table 1). TetraTech (2009) presents photographs of representative reaches of the Los Angeles River and channel cross section dimensions at the four LADPW and one Corps gaging stations (*i.e.*, gages F319-R at Long Beach below Wardlow Road, F34D-R at Downey below Firestone Blvd., F57C-R at Los Angeles above Arroyo Seco, F300-R at Los Angeles at Tujunga Avenue, and Corps below Sepulveda Dam).

Table 1. Channel Type Categories for the Los Angeles River, Los Angeles, County, CA

Channel Type	Concrete Lined with Low Flow Channel	Concrete Lined Without Low Flow Channel	Natural Bottom Channel
Channel Miles (percentage)	30.4 (62)	8.3 (16)	12.3 (22)

Typical trapezoidal channels have a bottom width of 200-400 feet and a top width of 400-600 feet with a depth of 20-35 feet (Tetra Tech 2002). There is typically a low flow channel embedded within the larger channel (Figure 3). Low flow channel dimensions in upstream reaches vary between 12-20 feet in width and are usually 1 foot in depth (Tetra Tech 2002)[4]. Typical rectangular channel widths range from 60-120 feet and typical depths are 12-20 feet. Low flow channel dimensions range between a width of 12-20 feet and a depth of 1-3.2 feet.

There are several reaches of the Los Angeles River that do not have low flow channels. These include river reaches with full concrete lining and unlined reaches. Concrete-lined river reaches that do not have low flow channels have a flatter cross-sectional geometry (Figure 4). Variations in channel geometry are significant because they are an important determinant of channel water depth. As a result, during the dry season surface water depths tend to be shallower in reaches with wider channel widths and no low flow channel when compared to reaches with either narrower channel widths and/or reaches with a flow channel.

The Los Angeles River has five reaches with no low flow channel, totaling about 8.3 miles or 16 percent of the river's total length. River reaches with no low flow channel and their approximate lengths include the following:

(1) Confluence of Arroyo Calabasas and Bell Creek (beginning of Los Angeles River) downstream 1.25 miles to Mason Avenue;

(2) Sepulveda Dam downstream 3.41 miles to just downstream from the Fulton Avenue Bridge;

(3) Bob Hope Drive downstream 1.82 miles to Bette Davis Picnic Area.

(4) End of Bette Davis Picnic area downstream 0.98-mile to immediately upstream of the Glendale Narrows; and

(5) Vernon Split downstream 0.88-mile to opposite Farmer John's and the resumption of the narrow low flow channel.

There are also several river reaches that do not consist entirely of concrete (Figure 5). The total distance of unlined channel bottom is approximately 12.3 miles, or 22 percent of the total length of the Los Angeles River. The unlined channel reaches are generally characterized by a soft-bottomed channel that is embedded within either concrete walls, or earthen banks with or without concrete revetment. The soft-bottomed reaches also support riparian and wetland vegetation and typically is characterized by greater water depth and water depth variability than channel reaches that are fully lined with concrete. The unlined reaches include:

(1) The 2.4-mile reach (34°11'00.16"N, 118°30'36.63"W downstream to 34°10'00.63"N, 118°28'25.44"W) within the Sepulveda Basin, a 2,150-acre flood control facility constructed in the upper watershed, that is designed to collect, retain, and release floodwaters during major storms. The Sepulveda Basin flood channel is unlined and soft-bottomed which allows the growth of dense riparian and wetland vegetation. Sloped channel banks consist of either grouted rip-rap or soil and vegetation;

(2) The 0.70-mile Bette Davis Picnic Site reach (34°09'24.21"N, 118°downstream to 34°09'21.81"N, 118°17'10.91"W) near Griffith Park consists of soft-bottomed channel within concrete walls;

(3) The Glendale Narrows reach a 6.0-mile reach from near the confluence of Verdugo Wash downstream to near the Pasadena (110) Freeway Bridge (34°08'47.40"N, 118°16'41.25"W downstream to 34°05'03.52"N, 118°13'40.35"W); and

(4) The 3.2-mile reach from the Willow Street Bridge (33°48'14.33"N, 118°12'20.13"W) downstream to the river estuary at Queensway Bridge (33°45'35.77"N, 118°11'57.26"W).

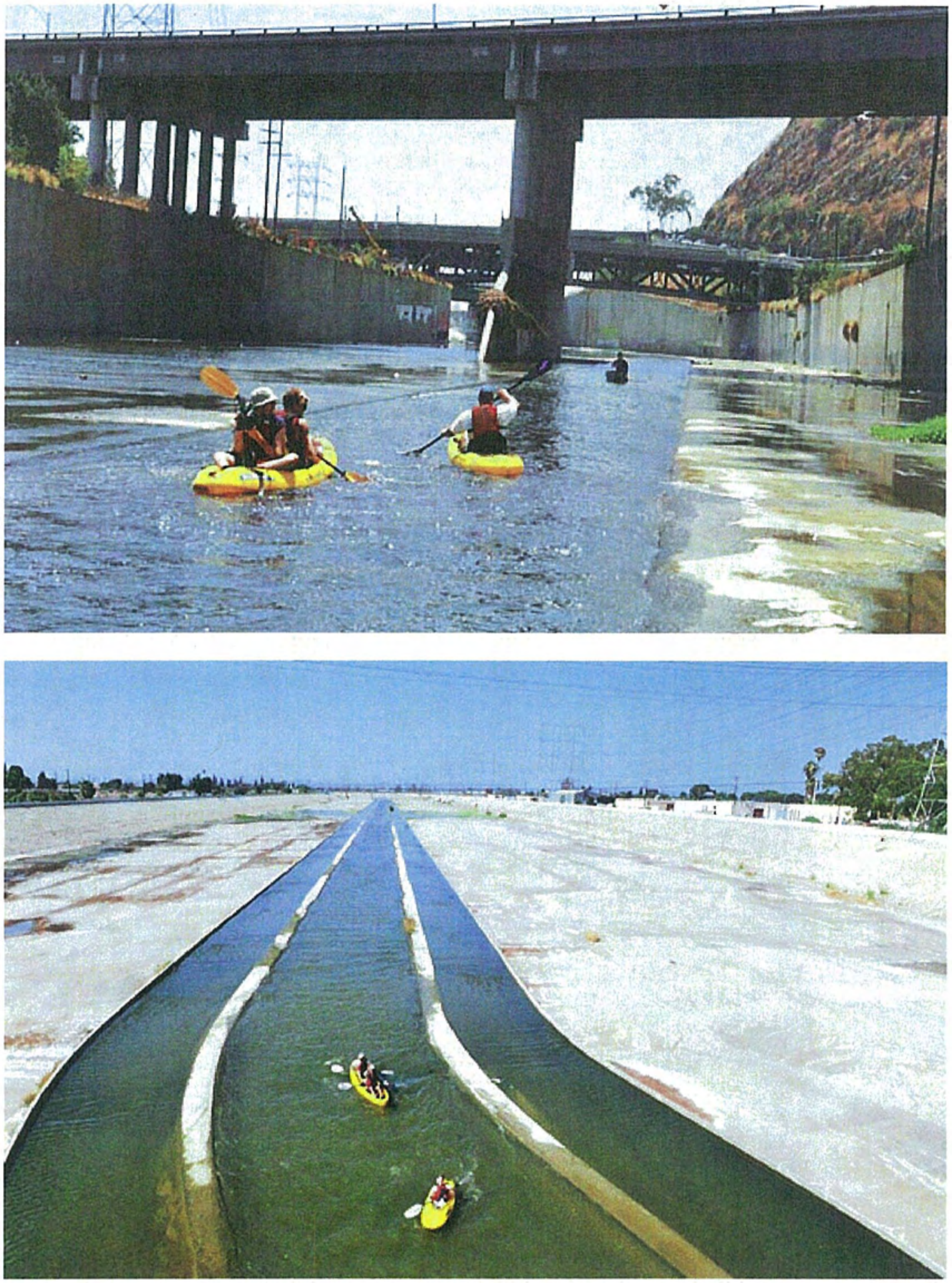
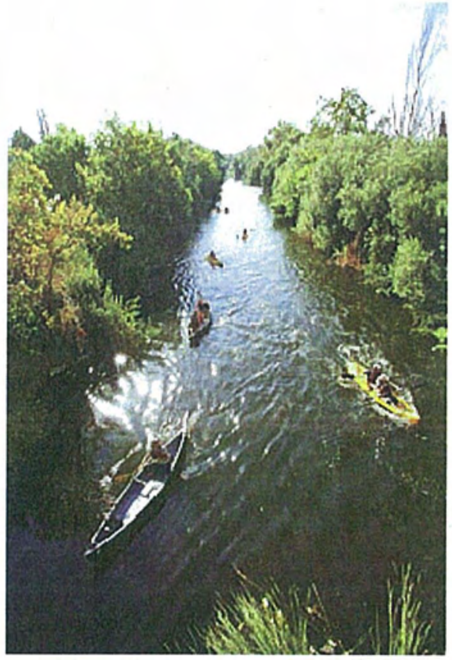


Figure 3. Photographs from July 25-27, 2008, taken by members of the Los Angeles River Expedition during the mid-point of the dry season. Examples of low flow channels embedded with larger concrete-lined flood channel. Top: Near the confluence of Arroyo Seco at the Interstate 110 overcrossing (RM 24.7). Bottom: Typical 16-mile reach between Vernon and Long Beach (RM 3.2-19.2).

Figure 4. Top: Example of dry-season river reach with no low flow channel at the confluence of Arroyo Calabasas and Bell Creek at Owensmouth Avenue, the beginning of Los Angeles River (RM 51). Bottom: Looking upstream at transition between reach with no low flow channel and beginning of low flow channel at Mason Ave. confluence Canoga Park (RM 59.8).



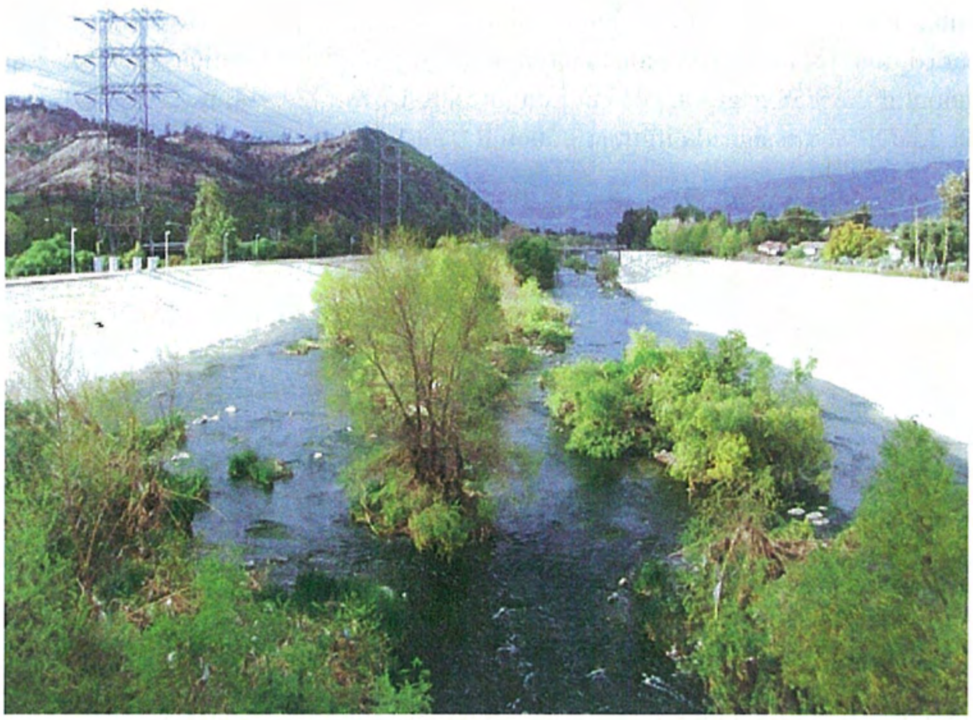


Figure 5. Examples of Fully and Partially Unlined Channel Reaches, Los Angeles River, California. Top: Sepulveda Basin, upper Los Angeles River (Approximate RM. 45.0) Photograph of the July 25-27, 2008 Los Angeles River Expedition. Bottom: Glendale Narrows (approximate RM 31.0).

Daily Flow Rate Analysis

EPA Region IX obtained from Tetra Tech a compilation of available data on flow frequency and flow depth at selected USGS and LADPW monitoring gages on the Los Angeles River. Current conditions that include the five water years covering October 2003 – September 2008 were analyzed separately. Daily flow data from four USGS gage stations and four LADPW gages along the Los Angeles River were downloaded and analyzed for the following parameters:

- Flow duration (for period of record and last 10 years);
- Flow percentiles (10, 25, 50, 75, and 90th percentile flows);
- Mean flow; and
- The period of record with the non-zero (measurable) flow.

Table 2 lists the eight gage stations, associated drainage areas, their period of recorded data, and the number of flow values in the record analyzed in this report. Their locations are shown in Figure 1. Note that operation of the USGS gages located at Long Beach, Downey, and Los Angeles were eventually taken over by the LADPW and assigned different station IDs and descriptions.

Table 2. Flow Gage Station Details (LADPW gage identifications in bold in parentheses)

USGS Station Name (LA DPW Location Description)	Station ID (LADPW Gage)	Drainage Area (sq. mi.)	Data Collection Period		# of Values in Flow Record
			Start	End	
LA R. at Long Beach, CA **(Below Wardlow R. Rd.)**	11103000 **(F319-R)**	827	10/1929	9/1992 **(Present)**	26,125
L.A. R. near Downey, CA **(Below Firestone Blvd.)**	11098500 **(F34D-R)**	599	3/1928	9/1978 **(Present)**	28,267
L.A. R. at Los Angeles, CA **(Above Arroyo Seco)**	11097500 **(F57C-R)**	514	10/1929	9/1979 **(Present)**	26,595
(L.A. R. at Tujunga Ave.)	**(F300-R)**	401	(8/1950)	**(Present)**	19,660
L.A. R. at Sepulveda Dam	11092450	158	10/1931	Present	19,846

Note: A photo log showing conditions at each of the gages and key road crossings is included in TetraTech (2009).

Daily flow statistics are presented in Table 3 and Table 4 for both the entire flow record and the five water years, October 2003-September 2008, respectively. We used flow statistics for the five recent water years to represent current flow conditions. All of these gaging stations show measured flow in the channel for a high percentage of the days, with the Los Angeles/Firestone Blvd. gage yielding the most measured flow days on average. During the recent five years the lowest 10th percentile flow is 52 cfs (at Tujunga Ave.) and the lowest minimum recorded daily average flow is 33.1 cfs (at Sepulveda Dam).

Table 3. Daily Flow Statistics for Entire Flow Record

Station Location (Flow Record)	Mean Flow (cfs)	Min Flow (cfs)	Flow Percentiles (cfs)					Max Flow (cfs)	% Non-zero Flow
			10%	25%	50%	75%	90%		
Long Beach/ Wardlow River Rd. (10/1929 – 9/2008)	280.6	0	6.0	16.0	42.0	132	252	55,000	99.95%
Near Downey/ Arroyo Seco (3/1928 – 9/2008)	178.1	0	4.8	14.0	39.0	124	174	40,000	99.3%
Los Angeles/ Firestone Blvd. (9/1979 – 9/2008)	149.8	0	0.2	3.2	24.0	98.0	167	27,900	94.8%
Tujunga Ave. (10/1950 – 9/2008)	123.3	0	7.4	11.1	35.0	75.5	110	19,600	99.98%
Sepulveda Dam (10/1931 – 2/2009)	48.7	0.03	1.8	5.0	8.5	24.0	78.0	9,750	100.0%

Table 4. Daily Flow Statistics for Five Water Years, October 2003 – September 2008

Station Location	Mean Flow (cfs)	Min Flow (cfs)	Flow Percentiles (cfs)					Max Flow (cfs)	% Non-zero Flow
			10%	25%	50%	75%	90%		
Long Beach/ Wardlow River Rd.	436.9	73.7	93	115	124	148	219	44,635	100%
Near Downey/ Arroyo Seco	173.1	124.0	127	130	133	136	166	5,204	100%
Los Angeles/ Firestone Blvd.	295.7	57.3	85	101	118	150	360	17,413	100%
Tujunga Ave.	227.6	36.0	52	62	75	96	230	15,803	100%
Sepulveda Dam	146.8	33.1	59	69	78	96	131	7,790	100%

Figures 6 and 7, respectively, show the flow duration curves for the entire flow record and for the five recent water years (*i.e.*, current flow conditions). The flow duration curve is a plot that shows the percentage of time that flow in a stream is likely to equal or exceed some specified value of interest. The flow duration curves exhibit a significant leveling off effect for the current condition flows, which indicate a predominant base flow range along the Los Angeles River between 40 and 200 cfs. Current base flows are significantly higher than the long-term average because of the effluent discharged throughout the year by POTWs and other point sources.

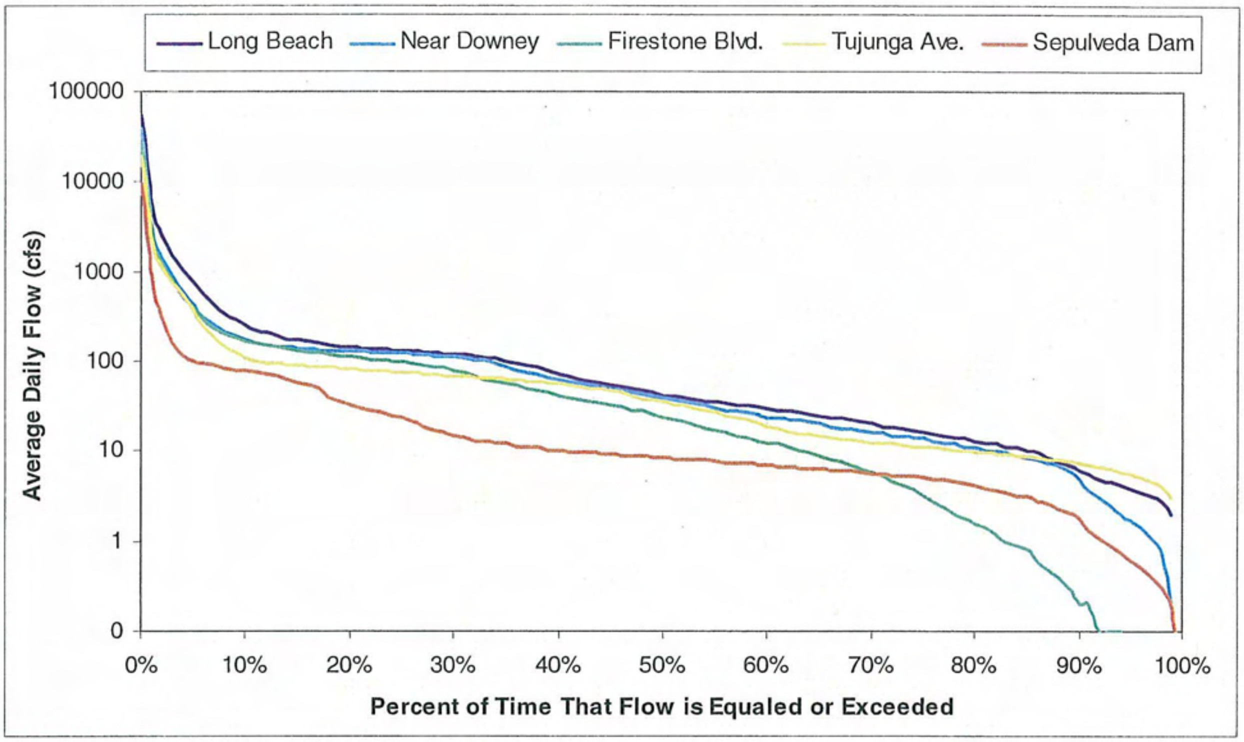


Figure 6. Flow Duration Curves for Entire Flow Record

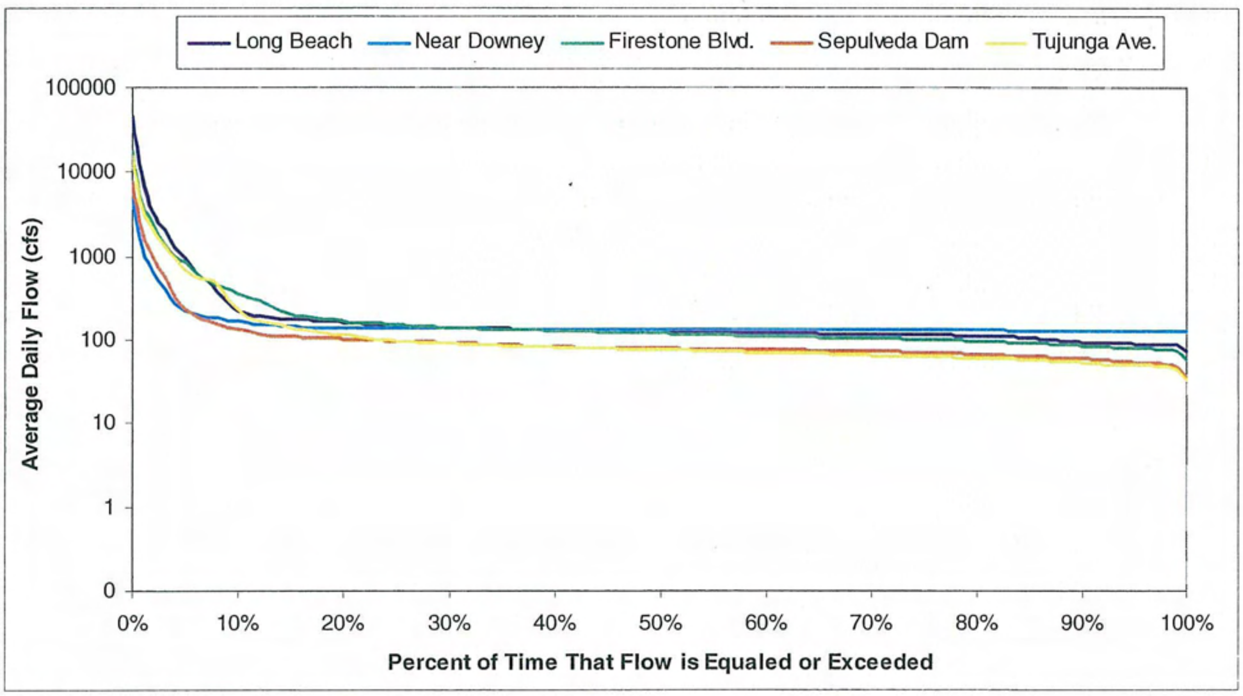


Figure 7. Flow Duration Curves for Past Five Water Years

Daily Flow Depth Analysis

EPA Region IX also collected information on flow depth. Since the reported data does not include flow depth or gage height, we calculated an average daily flow depth based on channel geometry and Manning's n roughness factors. The Corps provided three separate HEC-RAS models that covered all the flow gage locations. The HEC-RAS models included cross-section and longitudinal profile geometry, as well as Manning's n values that were needed to calculate stage-discharge relationships. We then utilized the WinXSPRO cross-section analyzer tool (developed by the United States Department of Agriculture, Forest Service) to calculate channel discharge values for various increments in stage. The cross-sections for all the flow gages are included in TetraTech (2009).

Regression fits to the stage-discharge estimates were developed using power functions at each gage site. Since four of the five gage sites included a low-flow channel, separate regression equations were developed for both the low-flow and high-flow conditions. Refer to Figure 8 as an example of the stage-discharge regression equations developed for the Long Beach gage.

Combining two regression equations presents minor difficulty in this analysis. Once flow begins to expand out of the low-flow channel onto the larger flood plain, flow conditions change from laminar to shallow and turbulent, and as a result become unpredictable and difficult to model. Note that switching to the high-flow regression equation at the top of low-flow pilot channel (*e.g.*, 1-foot flow depth) causes a false drop in flow rate, as exemplified in Figure 8. Therefore, we assumed that there was a range of flow beyond the low-flow channel bank-full discharge where increases in flow depth remain minimal. This assumption is obvious in the depth-duration curves for the Long Beach, Downey, and Firestone Blvd. gages, all of which are located in sections with low-flow pilot channels.

The estimated regression equations were used to calculate a flow depth for every observed flow record. Table 5 shows the statistics for the calculated flow depths for the current conditions in the Los Angeles River, since they are of most importance. The average daily flow depths range between 0.6 feet at Sepulveda Dam and 1.4 feet at Tujunga Ave. The minimum calculated flow depth during the recent five water years is 0.3 feet below Sepulveda Dam. Also, for all of the sites except Sepulveda Dam, only 10 percent of the daily flow depths ever recede below 0.8 feet, at the minimum.

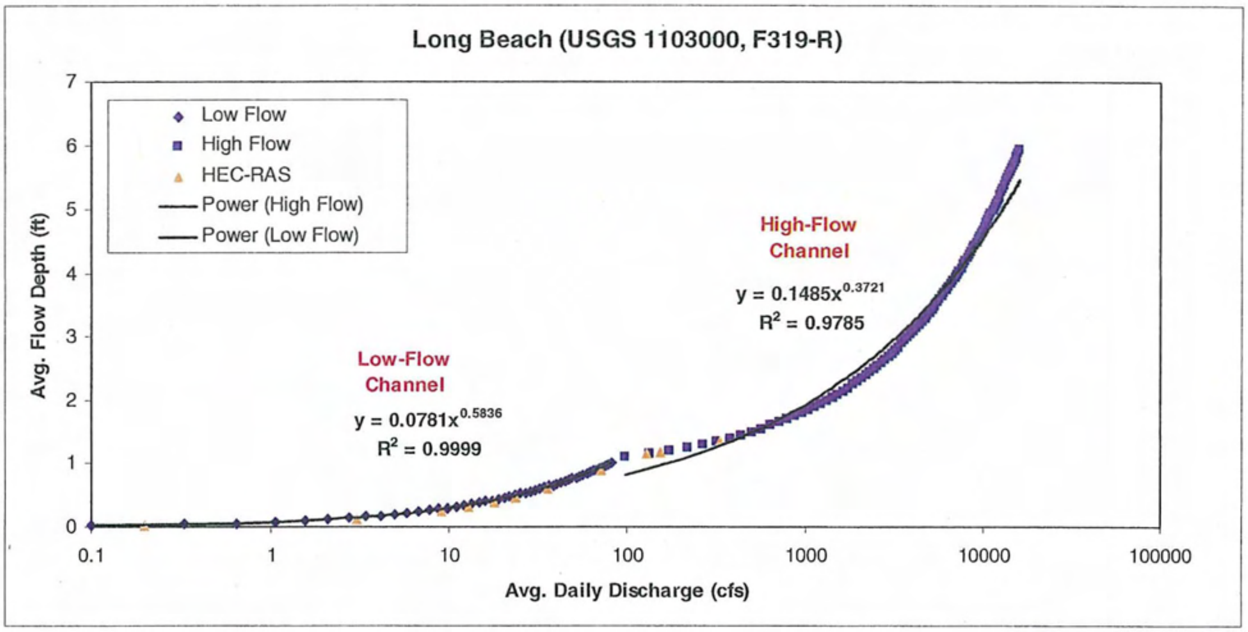


Figure 8. Example of Depth-Discharge Regression Equations Developed for Long Beach Gage

Table 5. Daily Average Flow Depth Statistics for Past Five Water Years

Station Location	Mean Depth (ft)	Min Depth (ft)	Depth Percentiles (ft)					Max Depth (ft)	% Non-zero Depth
			10%	25%	50%	75%	90%		
Long Beach/ Wardlow River Rd.	1.04	0.78	0.80	0.87	0.89	0.95	1.10	8.0	100%
Near Downey/ Arroyo Seco	0.92	0.86	0.87	0.87	0.88	0.89	0.95	3.3	100%
Los Angeles/ Firestone Blvd.	1.08	0.71	0.88	0.91	0.95	1.01	1.37	5.4	100%
Tujunga Ave.	1.38	0.64	0.85	0.95	1.07	1.25	2.16	8.9	100%
Sepulveda Dam	0.59	0.30	0.40	0.44	0.48	0.54	0.66	8.0	100%

We also developed daily depth-duration curves for both the entire flow record and the past five water years (Figure 9 and Figure 10, respectively). Flow depth values are displayed on a log scale to better show depth variation near the top of low-flow channels.

As shown in Figure 6, the depth-duration curves for current conditions also yield a leveling-off in base flow (around 1-foot depth for three of the gages). Flows at the Sepulveda Dam gage, which are largely restricted by the dam located immediately upstream, yield a noticeably smaller flow depth during the majority of the flow period. We also created monthly depth-duration curves, separated by gage location, for both current conditions over the last 5 years (0) and the entire flow record (TetraTech 2009).

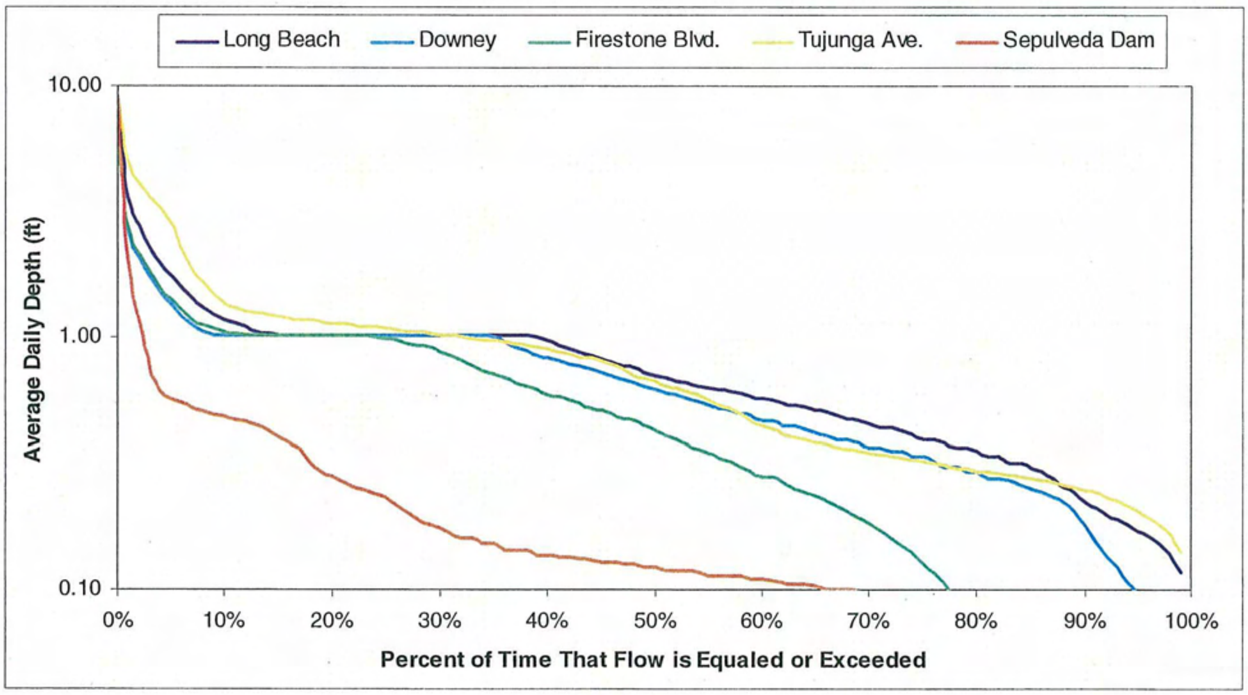


Figure 9. Daily Depth-Duration Curves for Entire Flow Record

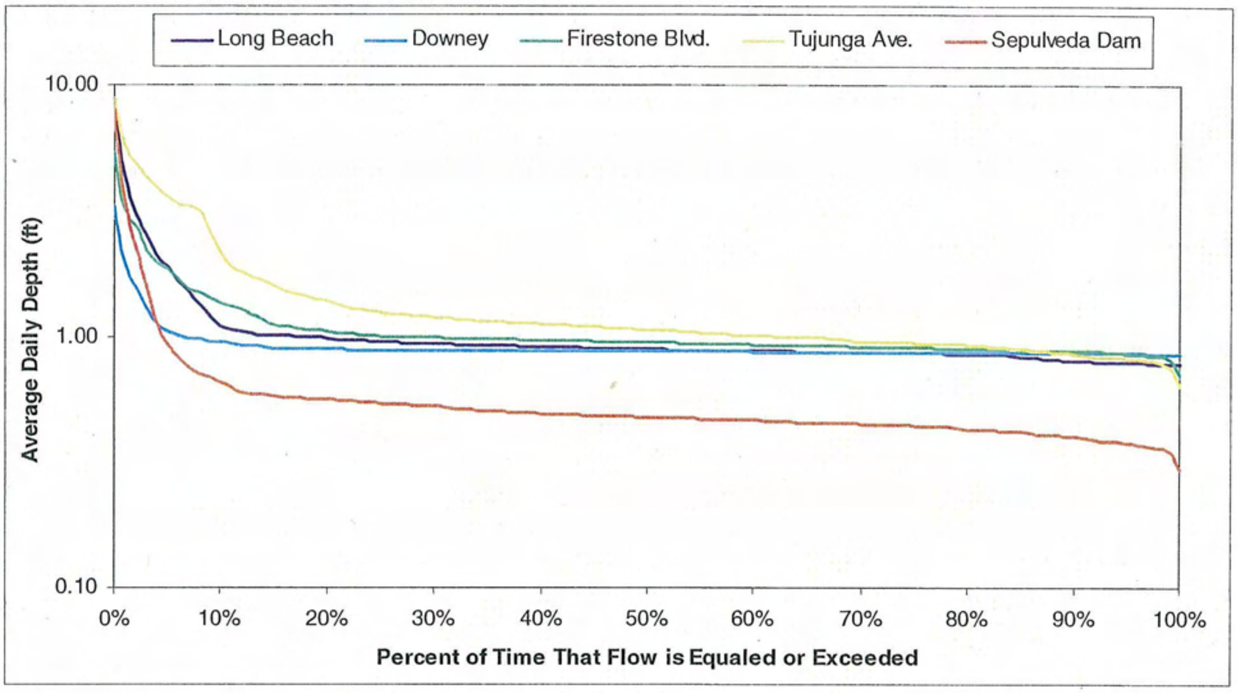


Figure 10. Daily Depth Duration Curves for Current Conditions

Historical Evidence of Navigation and Uses

We located several references related to historical navigation on the Los Angeles River. The Gabrielino Indians inhabited the Los Angeles River coastal plain. Gumprecht (1999) presents an excellent overview of the close relationship between the Gabrielino Indians and the Los Angeles River noting that:

> *The rivers and marshes also provided the raw materials that supported nearly every facet of the Gabrielino experience...tules and rushes were also used to construct rafts and canoes for navigating the [Los Angeles] region's waterways. Great piles of tules were tied in bundles ten feet in length, thick in the middle and tapered on both ends. These bundles were then lashed together to create a boat that could carry two people. At the time of arrival of the Spanish, these boats were the natives' sole means of water transport.* (pp. 33-34)

According to Gumprecht (1999) the Gabrielino Indians were known to use canoes to hunt for the abundant waterfowl and fish that occurred in near shore ocean waters, the river and adjacent floodplain ponds and lakes. It is likely that Gabrielino Indians used watercraft to navigate nearshore ocean waters, estuaries, and coastal inland waters such as lakes, ponds, sloughs, marshes, and rivers with sufficient water depth.

The first known description of the Los Angeles River is from the Spanish Portola/Crespi expedition in August of 1769. Crespi described the Los Angeles River near the present day Glendale Narrows as a *very full flowing, wide river* (Gumprecht 1999, p. 37). The following day near the Los Angeles River and Arroyo Seco confluence Crespi wrote that it was a *good sized, full flowing river* about seven yards wide *with very good water, pure and fresh.* (Gumprecht 1999, p. 37). This account indicates that prior to development during years of sufficient rainfall certain reaches of the Los Angeles River maintained significant surface flows well into summer.

William H. Brewer (1930) describes his navigation up the Los Angeles River in a steamer during December 1864:

> *The next morning, after stopping a few hours at Santa Barbara, we arrived at San Pedro, the port of Los Angeles, about twenty-five miles from here. We got in about sundown, rode six miles up the river on a small steamer, then disembarked for this place by stage.* (p. 12)

A distance upstream from the Pacific Ocean of six miles places the known extent of navigation at that time somewhere near the present City of Long Beach in the vicinity of Artesia Blvd. During the winter months of at least some years, the lower Los Angeles River was navigable by small watercraft.

Numerous photographs for the period 1885-1958 housed at the University of Southern California Digital Archive (http://digarc.usc.edu/) depict flow conditions in the Los Angeles River during various months. Several of the photographs show the river during major floods, as well as during dry-weather months with flows and depths sufficient to support navigation by small watercraft.

The Los Angeles Public Library photo archives have numerous photographs of the Los Angeles River, under different flow conditions, including at least three photographs that show boating on the Los Angeles River during flooding (http://www.lapl.org/ search terms "Los Angeles River"). There are several historical references of early-to-mid 20th Century navigation of the Los Angeles River, particularly during times of significant flooding.[5, 6] Gumprecht (1999, p. 16) based on a report by McGlashan and Ebert (1921) notes…*abundant and surprisingly consistent year-round flow in the river between Burbank and downtown Los Angeles…. The subterranean reservoir that supplies the river is so large, in fact, that even during extended droughts the flow of the river through the* [Glendale] *Narrows rarely fell below 20 percent of its average discharge*. Gumprecht (1999) also contains a photograph of the Los Angeles River from 1914 at Griffith Park depicting high flows capable of floating boats (see pg. 102, Figure 3.5). Figures 6.4, 6.5, and 6.6, in Gumprecht (1999, pp. 242-243), depict well-watered reaches of the Los Angeles River, and a large steelhead trout, for various dates from 1900-1997. Note that the flows depicted in Figure 6.4 of the Los Angeles River near Tujunga Avenue in Studio City show significant surface flows during September 1932, a typically very dry month when some of the lowest annual surface flows are expected. These historical accounts and photographs establish that there were sufficient flows to support at least sporadic navigation in the past, even during drier summer months in some locations.

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[5] Appendix D of letter dated March 20, 2009 to David W. Smith, EPA, from seven environmental groups, regarding the *Los Angeles River Status as Traditional Navigable Water (TNW)-Special case Review*. 9pp + 4 appendices.

[6] Attachment 2 (Historical Accounts of Boating from 1900s) of letter dated December 23, 2008 to David W. Smith, EPA, from Joe Linton, Los Angeles, CA. Cover letter + 7 attachments.

Evidence of Current Navigation and Related Uses

There are several accounts and references for current and increased navigation of the Los Angeles River by small recreational watercraft, including canoes and kayaks.[7] Gumprecht (1999) contains several photographs depicting surface water conditions along the Los Angeles River sufficient to float water craft. A photograph taken in 1995 (p. 246, Figure 6.7) depicts surface water within Sepulveda Flood Control Basin sufficient to float watercraft. Additional photographs (see pages 248-249 and 251, Figs. 6.8, 6.9, and 6.10), depict surface flows sufficient for navigation by watercraft in Glendale Narrows and near Griffith Park. Figure 6.9 depicts a canoe navigating through the Glendale Narrows (Gumprecht 1999). Gumprecht (1999, p. 236) mentions that local environmentalists will occasionally canoe the Los Angeles River following winter rains.

In a video titled *Visiting...With Huell Howser*, Episode 218, *LA River*, KCET-TV, dated circa 1995, the host Huell Howser navigates the Los Angeles River for most of its length to the Pacific Ocean. There is also a video of recent kayaking on the Los Angeles River (http://www.youtube.com/watch?v=)ro HhM 3l). An internet search also found several photographs of recent canoe and kayaking on the Los Angeles River at various locations, including Sepulveda Basin, Glendale Narrows, and other areas (see for example *Nature Trumps: An L.A. River Blog* compiled by Jay Babcock, May 2007). An internet search also shows that there is public access to the Los Angeles River, including Sepulveda Basin and Glendale Narrows.

July 2008: "The Los Angeles River Expedition"

On July 25-27, 2008 a group of about 12 kayakers and canoeists navigated almost the entire 51-mile length of the Los Angeles River in what they called "The Los Angeles River Expedition" (2008 Expedition)(Figures 11-12).[8],[9] The 2008 Expedition occurred during the month of July, typically a dry-weather period, in a drought year, when water flows and depths along the Los Angeles River are at or near their lowest, even with POTW discharges. Members of the 2008 Expedition divided the river into twelve sections and recorded their observations on the ease of navigability, water depth, and flow as they boated down the river, rating navigability of each section on a scale of 1 (lowest ease of navigability) to 10 (highest ease of navigability). The 2008 Expedition estimated that at least 90% of the 52-mile Los Angeles River was *moderately to highly navigable (navigability scores of between 4-10), and that less than 10% of the river (scores between 1-3) requires some form of lining of boats or portaging (at least in the dry*

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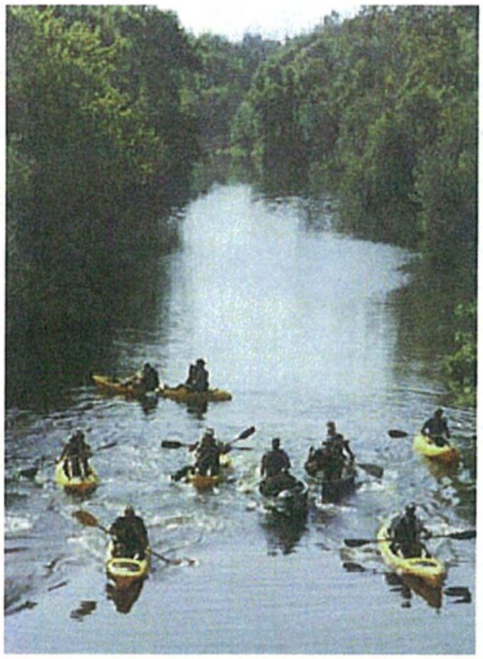
[7] Refer to Gumprecht (1999) and Appendices A, C, and D of letter dated March 20, 2009 to David W. Smith, EPA, from seven environmental groups, regarding the *Los Angeles River Status as Traditional Navigable Water (TNW)-Special case Review.* 9pp + 4 appendices.

[8] The stated purpose of this expedition was to demonstrate to the Corps and the public that the river was navigable-in-fact, following the Corps' initial limited TNW determinations. Appendix A of letter dated March 20, 2009 to David W. Smith, EPA, from seven environmental groups, regarding the *Los Angeles River Status as Traditional Navigable Water (TNW)-Special case Review.* 9pp + 4 appendices.

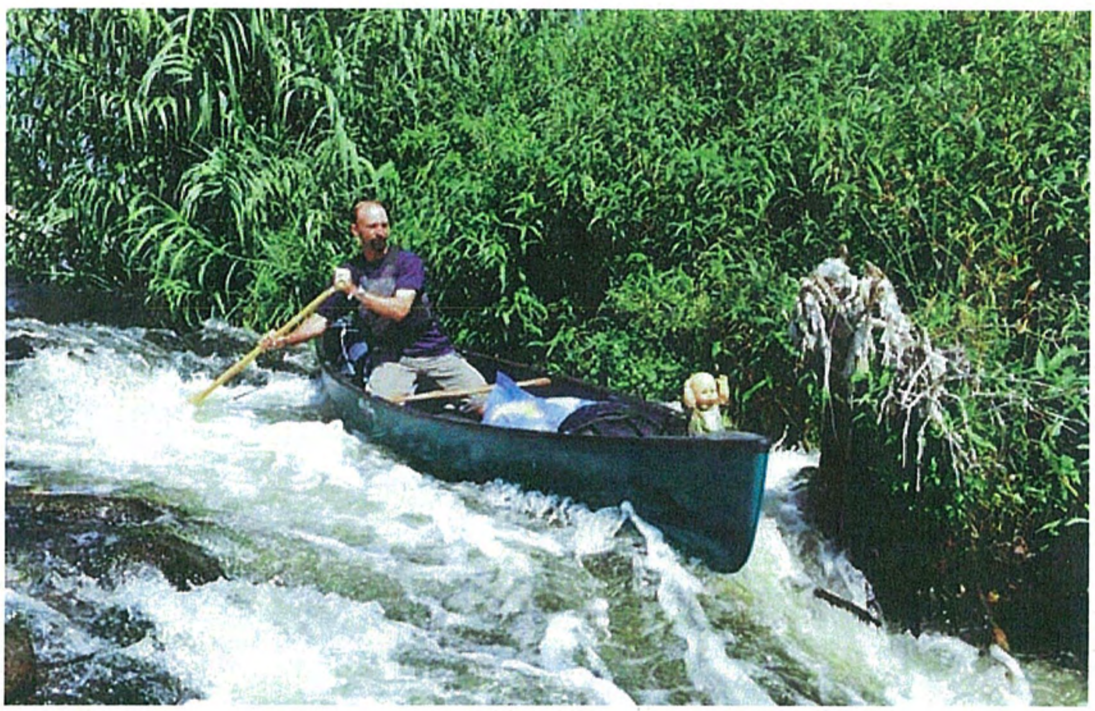
[9] Los Angeles River Expedition Report. September 2008. Report prepared by George Wolfe, expedition leader, in consultation with members of the Los Angeles River Expedition 2008. 29 pp. www.lalatimes.com/lariver/LARiver ExpeditionReport 72dpi.pdf

season)... (p. 2).[6] The 2008 Expedition also observed that typical water depth (in the height of summer in this drought year) for most of the river was approximately 8-12 inches. (p. 2). Maximum depths of 3-8 feet were encountered within some river reaches.



(a)

(b)



(c)

Figure 11. Photographs taken July 25-27, 2008, by members of the Los Angeles River Expedition. (a) Unlined reach of the Los Angeles River within the Sepulveda Basin (approximate RM 45). (b) Concrete-lined reach with low flow channel, downstream of the Sepulveda (approximate RM 42.5). (c) Shooting the Marsh Park rapids within the Glendale Narrows, an unlined reach (approximate RM 26.5).

Figure 12. Top: Photographs taken July 25-27, 2008, by members of the Los Angeles River Expedition. Concrete-lined reach with low flow channel along lower Los Angeles River, at E. 6th Street Bridge (approximate RM 21.5). Bottom: Lower Los Angeles River, at upper end of tidal estuary. The City of Long Beach is visible in the distance (approximate RM 2.75).

We also present the recorded flows and calculated flow depths at each gage location for the dates of the Los Angeles River Expedition, on July 25-27, 2008. Based on the average flow depths displayed in Table 6, flow conditions appear to have been sufficient for kayak and canoe navigation. This analysis also provides a basis for identifying the minimum water depths and flows necessary to support navigation at different locations in the Los Angeles River. In géneral, approximate water depths of 0.5-0.9 feet were sufficient to support navigation by kayaks and canoes. As illustrated in Figure 9, these depths are present the vast majority of the year at all gage station locations along the Los Angeles River.

Table 6. Flow and Depth for Los Angeles River Navigation Dates (7/25/08 – 7/27/08)

	7/25/08		7/26/08		7/27/08	
Station Location	**Flow (cfs)**	**Depth (ft)**	**Flow (cfs)**	**Depth (ft)**	**Flow (cfs)**	**Depth (ft)**
Long Beach/ Wardlow River	115	0.87	115	0.87	115	0.87
Near Downey/ Arroyo Seco	127	0.87	127	0.87	127	0.87
Los Angeles/ Firestone Blvd.	77.1	0.85	78.7	0.86	78.9	0.86
Tujunga Ave.	49.4	0.82	49.4	0.82	49.4	0.82
Sepulveda Dam	70.0	0.45	68.0	0.46	66.0	0.46

Stream Flow and Depth Conditions Necessary to Support Navigation

Historical base flows have been augmented in recent years by wastewater effluent discharges from POTWs along the Los Angeles River with resultant increases in flows over historical base flows. Waste water discharges provide an uninterrupted and generally consistent amount of water to the river during dry months and are expected to continue doing so into the foreseeable future. During dry periods, point source discharges, primarily from POTWs, may account for 60 to 100 percent of the total surface flow through the Los Angeles River (Tetra Tech 2002). The presence of a concrete-lined low-flow channel embedded within the center of the larger flood control channel along 62% of the river's total length concentrates base flows at depths that usually exceed one foot, which is sufficient for small watercraft to navigate the channels. Low flow channels typically range from 12-28 feet in top width. In addition, unlined or "natural" river reaches covering about 22% (12.3 miles) of the river support surface flows and depths that on average are typically greater than the fully-lined concrete channels.

Participants in the 2008 Expedition during dry-weather, low-flow conditions were able to navigate 90% of the Los Angeles River by kayaks and canoes. During the 2008 Expedition kayaks and canoes were able to navigate river reaches characterized by a low-flow channel, a uniformly-flat channel profile with no low flow channel, and natural channel with variable cross-sectional profile. Comparisons between the stream gages of daily flow statistics for the recent five water years (Table 5) with flows and depths for the 2008 Expedition dates (Table 6) shows that flows present during the 2008 Expedition have been exceeded at least 75% of the time. For three stream gages (*i.e.*, Arroyo Seco, Firestone Blvd. and Tujunga Ave.) the flows during the 2008 Expedition have been equaled or exceeded 90% of the time. For wet weather months (November – March), mean monthly discharges greatly exceed comparable dry weather-flows for all stream gages for all years of record (http://www.waterdata.usgs.gov/). This indicates that flows and water depths are also suitable for navigation by canoes and kayaks during the period November-March in most or all years.

Table 4 shows that the daily average flow depths for the five years October 2003 - September 2008 range from 0.59 ft at Sepulveda Dam gage to 1.38 ft at the Tujunga Ave. gauge. During the July 25-27, 2008 Expedition, gaged water depths ranged from 0.46 ft at Sepulveda Dam to 0.82 ft or greater at the remaining four gages (Table 5). The 2008 Expedition reported being able to navigate over 90% of the Los Angeles River under the depth conditions modeled for the five gage stations. Comparisons between the stream gages of daily average flow depth statistics for the recent five water years (Table 4) with flows and depths for the 2008 Expedition dates (Table 5) shows that the average flow depths that the 2008 Expedition navigated have been exceeded 75%-90% of the time.

Other supporting flow data from July 2005 shows that the median daily average flow for the dry summer months was 10 cfs, with a maximum monthly daily average of 92.2 cfs during July 2005 at the Sepulveda Dam gauge (Los Angeles River Revitalization Master Plan, LARRMP, 2007). Flows were substantially higher in non-summer months. For the period 2003-2007, mean monthly discharges in the Los Angeles River at the Sepulveda Dam gauge for May through September ranged from 73 cfs (July) to 96 cfs (May) (USGS 2008). Surface flow increases significantly as the river flows towards the Pacific Ocean. For example, the lower Los Angeles River had median and maximum daily average flows from 1991 to 2000 of 83 cfs and 11,900 cfs (LARRMP 2007). Flows during the dry summer months for the period 2003-2007 are similar to, or greater than, the flows recorded during the 2008 Expedition when canoes and kayaks were able to navigate most of the length of the Los Angeles River (Table 5). Dry weather flows (April-September) during the last 15 years have regularly exceeded the flows recorded during the 2008 Expedition for several locations along the Los Angeles River (For example, see Figure 3-11 to 3-15 in Tetra Tech 2002).

The Sepulveda Basin contains additional navigable waterbodies that connect to the Los Angeles River during periods of significant rainfall. Several conclusions from the document titled: *Water Control Manual Sepulveda Dam and Reservoir, Los Angeles River, California*, US Army Corps of Engineers (May 1989) are notable. For example, Table 2-03 indicates that the Sepulveda Wildlife Management Area (SWMA) lies between elevations 678.5'- 690.8'. Plate 4-07 further indicates that the flood exceedance interval in years for these water surface elevations ranges between about 1-5 years. There is a 12-acre lake that lies within the SWMA. The lake contains a boat ramp that supports navigation for park management purposes. Modeling data from the report indicate that this lake may be inundated and connected by surface flows to the Sepulveda Basin and Los Angeles River at relatively frequent intervals. In addition, Balboa Lake is another waterbody within the Sepulveda Basin that lies 300' from the Los Angeles River and is at an elevation of about 705'; a level that was reached by the river during the 1980 flood with an approximately 33 year recurrence interval. Finally, the design maximum outlet or spillway crest elevation for Sepulveda Dam is 710'. If this elevation is reached it would flood both Balboa and the SWMA lakes connecting them to the Los Angeles River.

Additional Documentation of River Navigation

EPA has received additional information from the public documenting navigation of several reaches of the Los Angeles River in small watercraft as part of recreational boating activities. For example, in 2007 one person successfully navigated the Los Angeles River from its beginning to the Pacific Ocean in a kayak made of plastic bottles (http://www.youtube.com/watch?v=nZY9rlEHYi8).

There are other several additional documented videos of individuals navigating by kayak various reaches of the Los Angeles River. Refer to

(http://www.youtube.com/watch?v=0ro   HhM 3I&NR=1&feature=fvwp), as one example of recreational navigation in the Los Angeles River.

Susceptibility to Future Navigation

The Los Angeles River Revitalization Master Plan (LARRMP) (2007) is intended to serve as a 25- to 50-year blueprint to revitalize the river by enhancing flood storage, water quality, safe public access, and ecosystem functions. The LARRMP was developed with broad community and government input and support, including the Corps. A major component of the LARRMP is to create a continuous river greenway, thereby extending open space, recreational opportunities, and water quality features into adjacent neighborhoods. The LARRMP contains numerous figures depicting possible scenarios to improve public access throughout a 32-mile reach of the Los Angeles River with the boundaries of the City of Los Angeles. The LARRMP provides for the development and improvement of boating facilities along several river reaches from approximately 6 miles upstream from Sepulveda Basin, downstream to the lower river. In addition, the plans to restore natural features in the Los Angeles River such as channels, loops and oxbows (see below) will facilitate additional recreational navigation by canoes, kayaks, and rafts.

The LARRMP makes the following specific recommendations related to access to recreational opportunities along the Los Angeles River:

- Recommendation #4.8 includes the provision of enhanced opportunities for safe public access to the water (p. 4.15);
- Recommendation #4.9 proposes the creation of temporary pools and lakes for water based recreation, "including recreational boating", by installing inflatable water dams that are already being used in the river (p. 4.15- 4.16). Figure 4.14 identifies nine potential locations for these dams;
- Preferred Alternative B for the Chinatown-Cornfields Area recommends a large "diversion" channel that creates "recreational access and use", including use by "kayakers in great numbers" (p. 6.30). This potential channel improvement would lie within the floodplain and therefore maintain a hydrological connection to the Los Angeles River.

The City of Los Angeles recently confirmed to EPA its intent to implement the recommendations contained in the LARRMP and, specifically, to expand opportunities for recreational navigation throughout the mainstem river. By endorsing the LARRMP in 2007, the Los Angeles City Council has called for development of boating based recreation in several locations along Los Angeles River. The City of Los Angeles has undergone an extensive planning process in the development of the LARRMP, including public input at several workshops. The LARRMP is intended to create recreational resources that will appeal to interstate and international visitors much as urban river restoration plans have created strong visitor interest in other urban areas throughout the United States. The Los Angeles area and surrounding environs is well-recognized as a national and international visitor destination. Given the central geographic location of Los Angeles River to the City, as well as its close proximity to interstate highways and existing visitor destinations (*e.g.*, Sepulveda Basin recreation and wildlife area, Griffith Park, Universal Studios, and The Queen Mary) it is likely that a restored Los Angeles River will attract interstate and international visitation and commerce. EPA also has received several citizen letters expressing interests in future boating in the Los Angeles River should recreation access and restoration be implemented.[10] EPA has received several citizen letters expressing a desire to develop a commercial enterprise aimed at teaching environmental science to school children focused largely through boating on the Los Angeles River.[9, 10, 11]

Other Contextual Information

Much of the 51-mile length of the Los Angeles River is accessible to the public, even though public access is not officially sanctioned and may be explicitly prohibited at some locations. There are numerous areas with public access that are immediately adjacent to interstate highways and surface streets that accommodate parking and access to the river. For example, there are 107 crossings of the Los Angeles River, many of which allow some form of access the river. The County of Los Angeles, Department of Public Works, lists twenty-one access points along the 25 miles of the Los Angeles River under their jurisdiction that have no access restrictions.[12] There is also a formal and informal bicycle trail along

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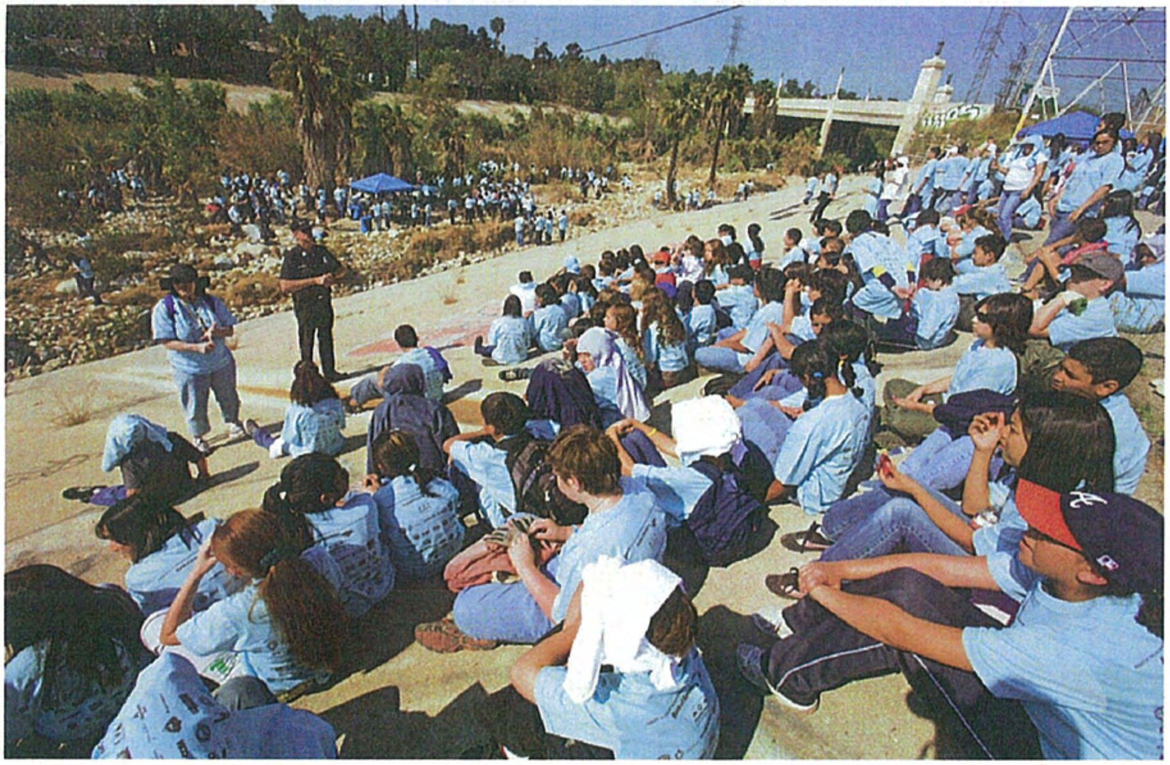
[10] Appendix B of letter dated March 20, 2009 to David W. Smith, EPA, from seven Environmental Groups, regarding the *Los Angeles River Status as Traditional Navigable Water (TNW)-Special case Review*. 9pp + 4 appendices.

[11] Letter to David W. Smith, EPA, from George Wolfe, *LA River Expeditions*, dated December 16, 2008.

[12] Letter to David W. Smith, EPA, from Gail Farber, Director of Public Works, County of Los Angeles, dated July 9, 2009.

approximately 49 miles of the Los Angeles River (from Long Beach to Burbank). There are many locations adjacent to the Los Angeles River, especially in the vicinity of public parks (*e.g.*, Sepulveda Basin, Elysian Park) where the public regularly gains access for recreational boating, fishing, educational activities, bird watching, artistic festivals, and other community activities (Google Images, search term "Los Angeles River") (Figures 13and 14).



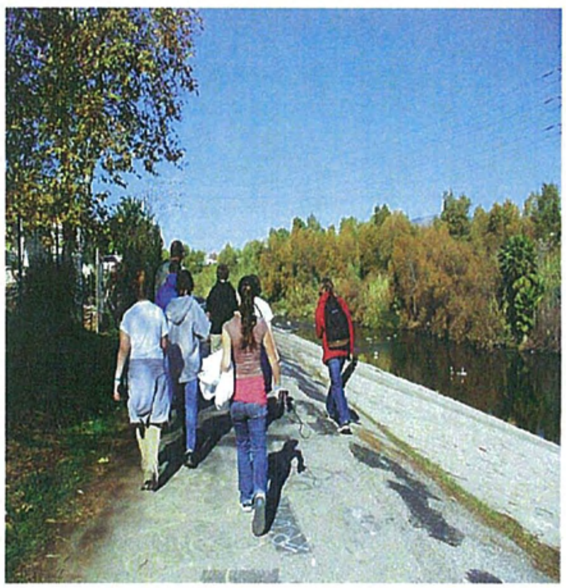


Figure 13. Two examples of public access to the Los Angeles River. Top: Friends of the Los Angeles River (FoLAR) outdoor environmental education festival, River School Day provides hands-on educational experiences for 4th - 12th grade students along the banks of the Los Angeles River. Bottom: FoLAR's guided public tours of the Los Angeles River. Photos: www.FoLar.org.

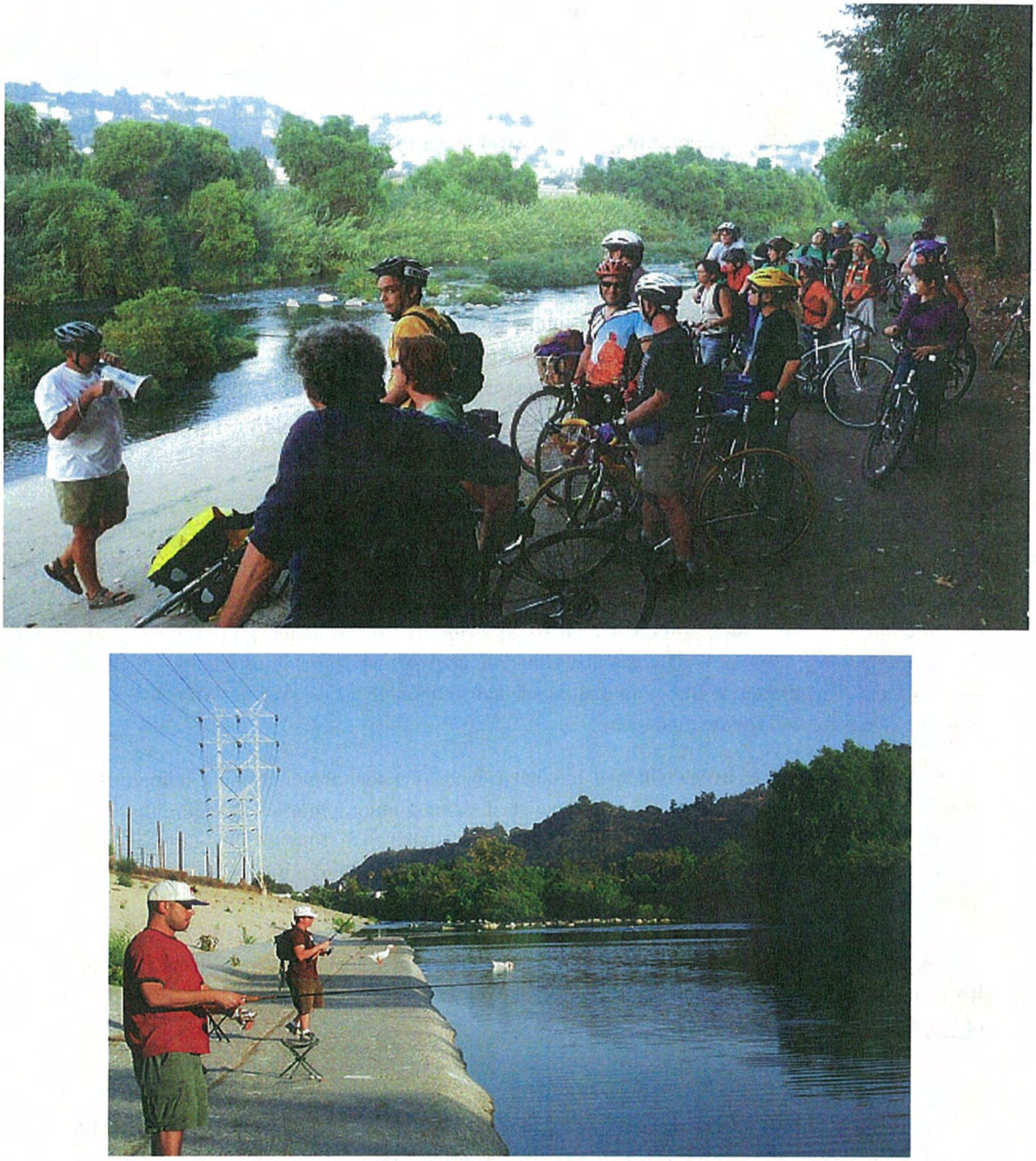


Figure 14. Examples of public access to the Los Angeles River for various recreational activities such as biking (top) and fishing (bottom).

The Sepulveda Basin supports significant recreational activities. Balboa Lake has a boating concession that supports substantial fee-based recreational boating (http//www.laparks.org/dos/aquatic/facility/lakeBalboa.htm). Public reviews of Balboa Lake included 2 of 15 reviews from out of state, including South Carolina and Missouri (http://www.yelp.com/biz/lake-balboa-encino#hrid:PDRzE7AOQ5K2CmqOBfJ7SA).

The Los Angeles Tourist website lists Sepulveda Basin Wildlife Area as a destination for tourists (www.latourist.com). The Encino Chamber of Commerce lists Sepulveda Basin as an area for recreational opportunities (www.encinochamber.org). The Sepulveda Basin is a major Los Angeles area recreational destination. It is reasonable to assume that some out of state and international visitors to the Los Angeles area use the Sepulveda basin. Birding America identifies the Sepulveda Wildlife Area as an important birding location in Southern California (www.birdingamerica.com). Over 200 species of birds, many migratory, have been identified from the Sepulveda Basin Wildlife Area.

The Sepulveda Basin Wildlife Area is listed at several websites as a teaching laboratory for school children and universities. Cal State Northridge and the University of California, Los Angeles, among others - use the site for teaching and natural science research. (Refer to: http://www.csun.edu/scied/3field%20study/sepulveda_basin/index.htm and http://www.centerx.gseis.ucla.edu/globe/sites/sepulveda.htm). The National Birding Hotline Cooperative has entries for rare bird alerts for the Sepulveda basin. The Hotline is regularly used by out-of-state birders to identify rare sightings (For example see: http://listserv.arizona.edu/archives/birdwest.html.

The Sepulveda Basin is a major Los Angeles area recreational destination. Presumably, the Sepulveda basin gets use from out of state and international residents visiting the Los Angeles area. Of note is the fact that Congressman Brad Sherman, 27th House District, has secured millions in federal funding over the last decade to restore natural habitats and improve recreational opportunities in the Sepulveda Basin. Gumprecht (1999, p. 247) notes that Glendale Narrows is desirable as a fishing location, especially for children. An internet search found that residents along the Los Angeles River fish recreationally, typically releasing fish following capture.

The Los Angeles River channel has been used as a location in filming numerous, well-known, motion pictures. As a result, there is a high level of interest among tourists in seeing these movie filming locations. Several commercial tour operators offer tours that visit film locations along the Los Angeles River. Future development of the river for navigation is reasonably likely to provide opportunities for tour operators to offer boating based tours of famous filming locations along the river.

Numerous films, video games, and television programs have featured various sites along the Los Angeles River, many of which involve the river as a sinister plot location. Wikipedia lists the following films at http://en.wikipedia.org/wiki/Los_Angeles_River:

> *The Adventures of Buckaroo Banzai Across the 8th Dimension*, *Chinatown*, *Them!*, *Blue Thunder*, *Escape from L.A.*, *Terminator 2: Judgment Day*, *Grease*, *Volcano*, *Point Blank*, *Freaky Friday (1976 film)*, *Roadblock*, *Hot Rod Girl*, *Blood in Blood Out*, *Boomtown*, *Rize*, *The Core*, *Repo Man*, *The Italian Job*, *Point Break*, *Gone in 60 Seconds*, *Transformers*, *24*, *The Gumball Rally*, *To Live and Die in L.A.*, *The First Power*, *Purple Rain*, *The Tonight Show with Conan O'Brien* and many others, including a skit on the show *Jackass*...Discovery Channel filmed scenes of *The Colony* in the Los Angeles River...Los Angeles River, served as the starting line for the fifteenth season of *The Amazing Race*. Fifteen music videos have also been filmed at the Los Angeles River.

Several lines of evidence indicate the Los Angeles River has a commerce connection:

(1) The river receives boating use in several locations on its main channel and in adjacent waters that are part of its flood plain; and

(2) The river supports boating and non-boating based recreational uses that are widely advertised and available to the interstate public. Areas with public access are immediately adjacent to interstate highways and have ready parking and trail access.

Findings and Conclusions

- Historically, the Los Angeles River was navigated at least occasionally during years and seasons when there was sufficient surface flow. Native Americans are believed to have navigated portions of the lower river, especially as a means to acquire food resources. Navigation was likely most feasible during the months of November-March during years of normal to above normal precipitation.

- The 51-mile mainstem length of the Los Angeles River is currently navigable by small recreational watercraft, such as canoes and kayaks during periods of moderate to high water. During dry-weather months (*i.e.*, typically April-October) when river flows are lower, average channel depths are typically 0.75-feet or greater, which is sufficient for navigation by small watercraft. Over 90% of the mainstem Los Angeles River was navigated in 2008 by canoes and kayaks under low-flow conditions.

- Analysis and calculations of water flows and depths, as well as the experiences of the Los Angeles River Expedition, supports the conclusion that over 90% of the Los Angeles River is navigable by small watercraft when water average channel depths are 0.75-feet or greater. The existence of a low flow channel along 62% of the total length of the Los Angeles River, as well as the existence of several unlined "natural" reaches along 22% of the rivers total length facilitates navigation of small watercraft during typical dry-weather, low-flow, periods.

- The City of Los Angeles has developed and is implementing a 30-year plan to transform the Los Angeles River into a publicly accessible natural open space resource, and create more extensive use of the River environment for both passive and active recreation. Implementation of the LARRMP would result in new and expanded recreational uses, including boating. The ability to navigate the Los Angeles River for much or all of its entire length is an anticipated future activity. A goal of the LARRMP is to establish optimal water quality and restore the river as a fishable and swimmable water body, which can be used for boating and water recreation.

- The available evidence demonstrates that the mainstem Los Angeles River, from its origin at the confluences of Arroyo Calabasas and Bell Creek, to its estuary at the Pacific Ocean, is a TNW. This conclusion is based on substantial evidence that the River is susceptible to commercial navigation, as well as the available evidence of historical navigation, current recreational uses, current flow characteristics, and the City of Los Angeles' specific plans for restoration of the River.

References

Brewer, W.H. 1930. *Up and Down California in 1860-1864*. Edited by F.P. Farquhar. Yale University Press, New Haven.

Gumprecht, B. 1999 (revised 2001). *The Los Angeles River – It's Life, Death and Possible Rebirth*. John Hopkins University Press, Baltimore. 372 pp.

Los Angeles County Department of Public Works (LACDPW). 2006. Hydrology Manual. Water Resources Division. January 2006. Alhambra, CA. http://dpw.lacounty.gov/wrd/publication/

Los Angeles River Master Plan (LARMP). 1996. Los Angeles River Master Plan. Los Angeles Department of Public Works, Los Angeles, CA. www.ladpw.org/wmd/watershed/LA/LARMP

Los Angeles River Revitalization Master Plan (LARRMP). 2007. Final PEIR/PEIS. City of Los Angeles, Department of Public Works, Bureau of Engineering, CA. April 2007. http://www.lariverrmp.org/

McGlashan, H.D. and F.C. Ebert. 1921. *Surface Supply of the Pacific Slope of Southern California*. U.S. Geological Survey Water-Supply Paper 447. Washington, D.C. 441 pp.

Tetra Tech, Inc. 2009. Los Angeles River Analysis. Memorandum, prepared by Tetra Tech, Inc. for the U.S. Environmental Protection Agency, Region 9, San Francisco, CA. March 30, 2009.

Tetra Tech, Inc. 2002. Modeling Analysis for the development of TMDLs for Nitrogen Compounds in the Los Angeles River and Tributaries. Submitted to the U.S. Environmental Protection Agency, Region 9, San Francisco, CA. Draft, August 2002.

U.S. Army Corps of Engineers. 2008a. Determination of TNW Status of the Los Angeles River (File No. 2008-218-AJS), Memorandum for Chief, Regulatory Division, Los Angeles District, Corps of Engineers, March 20, 2008. 4 pp, w/enclosures.

U.S. Army Corps of Engineers. 2008b. Memorandum for the Record: Determination of Traditional Navigable Waters (TNW) on the Los Angeles River. Los Angeles District, Corps of Engineers, June 4, 2008. 4 pp.

U.S. Army Corps of Engineers. 1989. *Water Control Manual Sepulveda Dam and Reservoir, Los Angeles River, California*, US Army Corps of Engineers (May 1989), Los Angeles.

U.S. Environmental Protection Agency. 2005. Total Maximum Daily Loads for Metals Los Angeles River and Tributaries. Report by USEPA, Region 9, and California Regional Water Quality Control Board, Los Angeles Region, Revised May 27, 2005. 85 pp. + Attachments and Appendices.

U.S. Geological Survey. 2009. USGS Surface Water Data – Monthly Statistics. National Water Information System: Web Interface. USGS 11092450, Los Angeles River at Sepulveda Dam, CA. http://waterdata.usgs.gov/nwis/monthly.