3.1 INTRODUCTION

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Yolo County is in the process of developing a comprehensive Cache Creek Resource Management Plan (CCRMP). The creek's valuable resources include: aggregate, surface water, ground water, environmental and ecological resources. The Yolo County Community Development Agency authorized the preparation of three technical studies to be used by the County as the scientific basis for development of the CCRMP and its implementing ordinances. The three technical studies include the Streamway Study, Groundwater Study, and Biological Responses Study. This report presents the results of the Streamway Study, one of the three technical investigations. The Streamway Study analyzes fluvial geomorphic and hydraulic characteristics of Cache Creek to facilitate the formulation of effective plans by the County to manage the resources of the Lower Cache Creek System.

Location and Study Area

Cache Creek is located in Yolo, Lake and Colusa counties in northern California. The drainage basin shown in Figure 3.1-1 extends from the upper basin highlands north and northeast of Clear Lake to the Yolo Bypass east of Woodland. This investigation focuses on the study area defined by the county as approximately 1 to 1.5 miles on either side of the present channel for approximately 14.5 miles from Capay Dam downstream to the I-5 bridge near the community of Yolo.

Need for a Streamway Investigation

Cache Creek possesses valuable natural resources which should be preserved and managed to maximize their overall benefit to the people of Yolo County. The creek provides valuable habitat for wildlife, produces approximately five percent of the construction grade aggregate for the State of California, and transports and stores high quality water for agriculture and municipal use. It also provides significant recreational, educational and aesthetic values. The study reach has been mined for aggregate resources for more than 100 years, with the most extensive mining activities occurring since 1950. Aggregate mining has resulted in annual and cumulative extraction rates exceeding the capacity of the stream to replenish the gravel.

Dam building along the creek (the old Moore Diversion Dam, Indian Valley Reservoir and the Capay Irrigation Diversion Dam) and increased urban and agricultural demands on surface and groundwater resources have also modified and reduced seasonal flows, resulting in additional reduction of annual water and gravel deliveries to the lower reaches of the creek. Consequently,

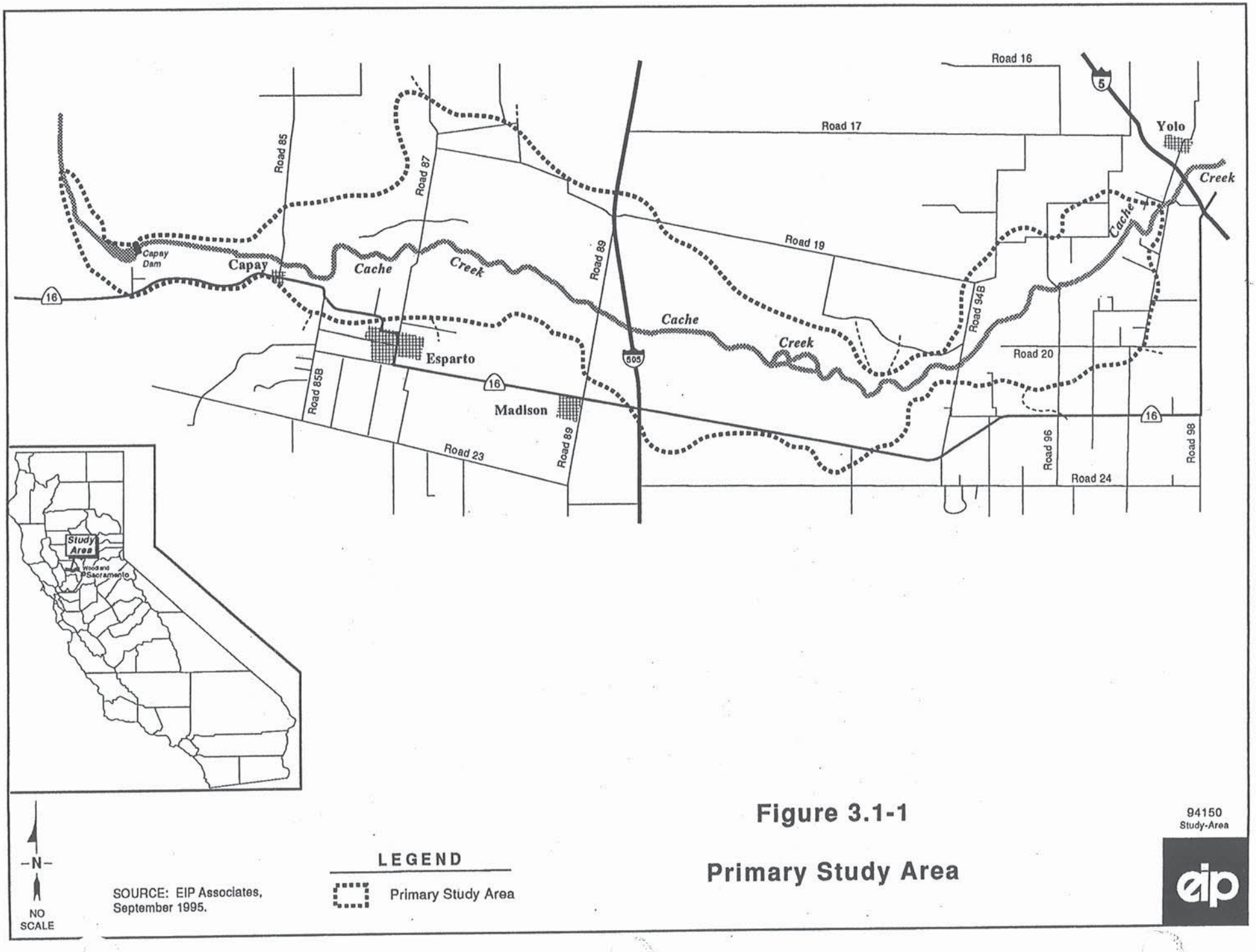

Figure 3.1-1

Primary Study Area

94150
Study-Area

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that portion of the creek from the Capay Dam to the Cache Creek Setting Basin has been forced out of balance with the rest of the river system. The river's attempt to restore dynamic equilibrium resulted in accelerated channel adjustments (channel incision and degradation, localized scour near bridge crossings, and lateral migration).

As the hydrologic and environmental impacts of these channel altering activities have become better recognized over the past two decades, the County of Yolo has struggled to develop an effective strategy to manage the resources of the Creek System. An interim ordinance was adopted to manage aggregate extraction in 1979, but a long-term plan for the management of aggregate and/or other resources has yet to be developed. Numerous studies have been conducted over the past two decades, and while some have provided important insights into the functioning of the Cache Creek system, an integrated understanding of the geomorphology, sediment transport, hydrology (surface and groundwater), and biological resources of Cache Creek (and how the behavior of the system has changed over time) has proved elusive.

The changes that have occurred along Cache Creek as a result of modified land use, water use and aggregate extraction make it apparent that a comprehensive Resource Management Plan is urgently needed. The three technical studies provide an integrated approach to understanding the creek in the study reach as a complex system, and will serve as the basis for the CCRMP.

Objectives and Scope

The purpose of the streamway study is to provide an understanding of the hydrologic and geomorphic processes effecting the Cache Creek and to provide the technical foundation for development of the CCRMP.

The objectives of the streamway study are to:

- develop a systems understanding of the hydrologic and geomorphic behavior of the Cache Creek study area over time;
- develop an understanding of sediment processes (supply, transport, and loss), hydrology, and hydraulics under present and historical conditions; and
- apply this understanding of physical processes of the Creek as an integrated system to develop recommended management concepts.

The scope of this study was to summarize relevant existing information, collect additional data within the limits of time and budget, and perform additional analyses needed to provide the technical basis for the County to develop a resource management plan for Cache Creek. Specifically, the streamway investigation compiled existing information about basin geology and geomorphology, conducted limited field investigations with an emphasis on sources and transport of gravel and sand suitable for use as commercial aggregate, reviewed available hydrologic information and supplemented those data with addition information and analyses, developed hydraulic and sediment transport models for existing and historic conditions, and researched and

summarized significant human influences on hydrology and channel morphology (from maps, historical photographs, technical reports, interviews, historical accounts and documents). Using historical maps and aerial photographs, NHC documented channel plan form and profile changes over time. Numerical analyses were performed to quantify the magnitude and sensitivity of key geomorphic and hydrologic characteristics. Management concepts were developed and discussed with other members of the technical studies team, and tested numerically. Finally, recommendations were developed to meet specific management objectives.