



Lower Clear Creek Gravel Augmentation Program

Clear Creek Restoration Technical Team

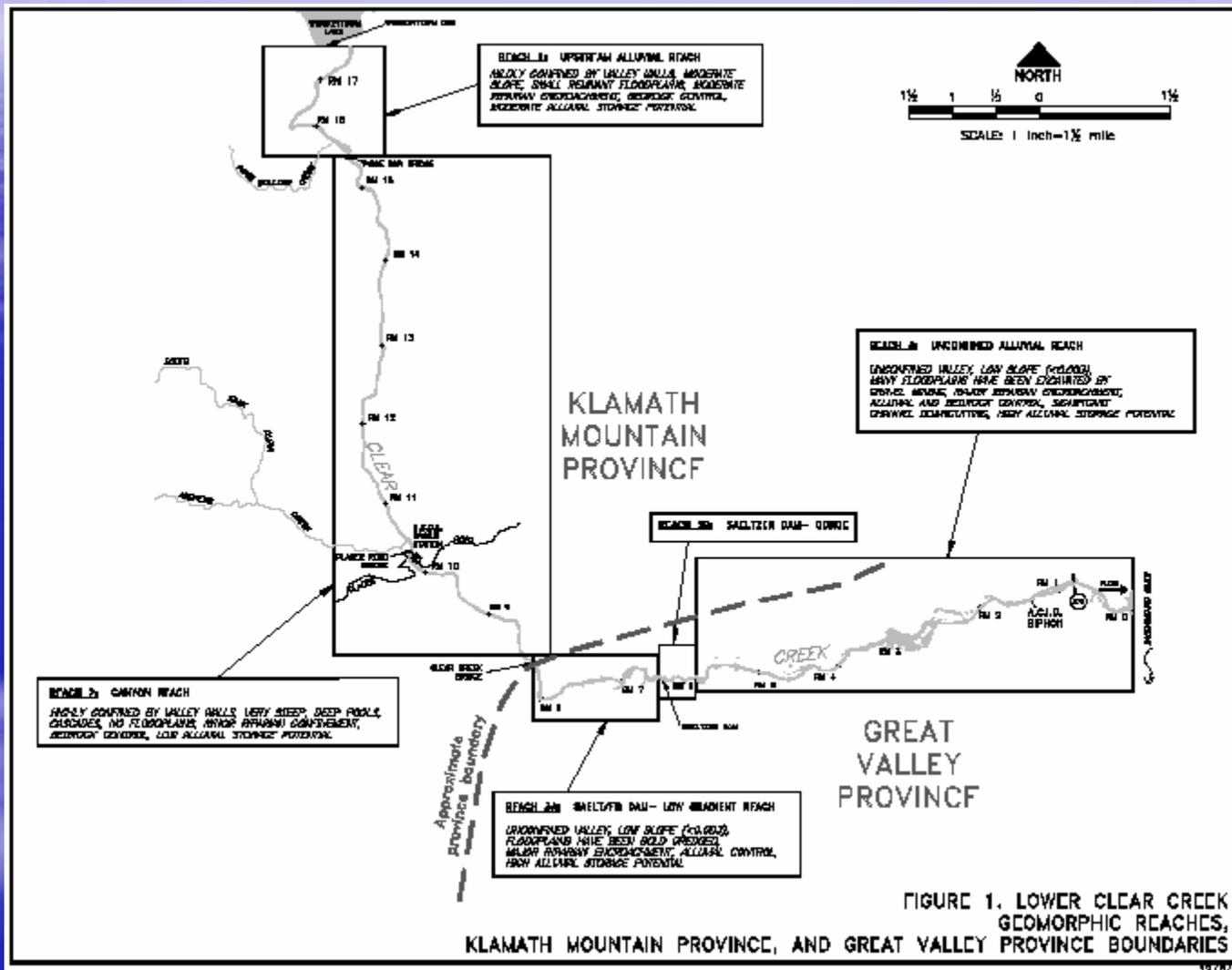
- U.S. Bureau of Reclamation
- U.S. Fish and Wildlife Service
- National Marine Fisheries Service
- Natural Resource Conservation Service
- National Park Service
- Bureau of Land Management
- California Water Resources
- California Fish and Game
- California Regional Water Quality Control Board
- Western Shasta County Resource Conservation District
- Shasta County Environmental School
- Clear Creek Coordinated Resource Management Group

HISTORY OF CLEAR CREEK



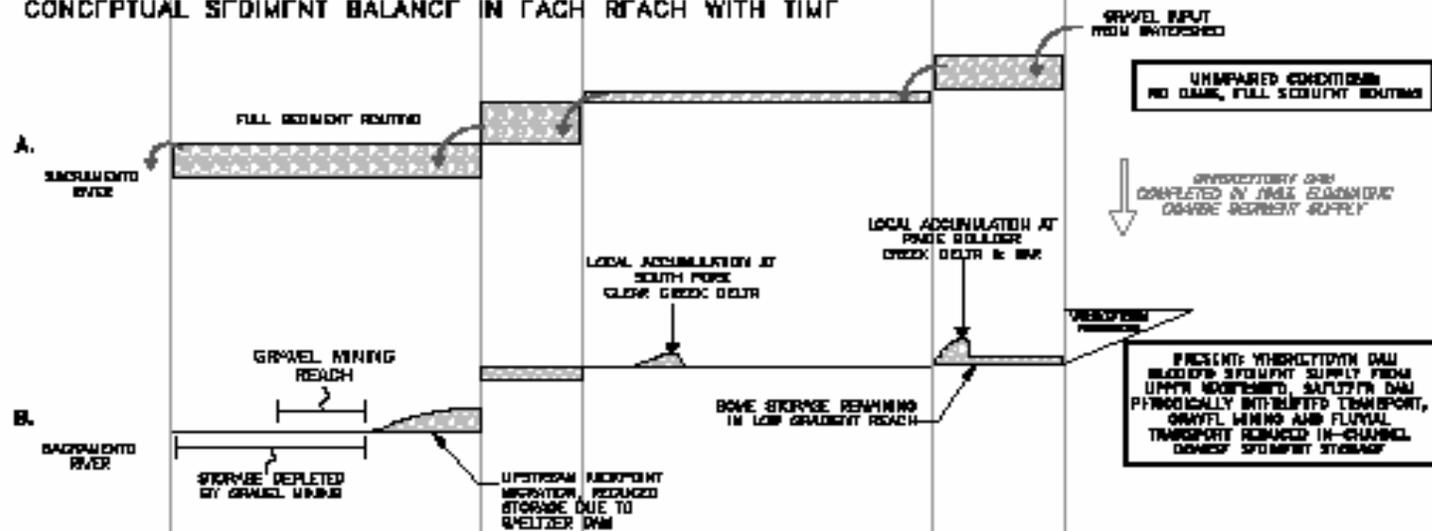
- Discovery of gold at Reading Bar in 1848
- Placer, hydraulic, and dredge mining
- Secondary adverse impacts
- Saeltzer Dam
- Commercial Aggregate Mining





12/0/01

CONCEPTUAL SEDIMENT BALANCE IN EACH REACH WITH TIME



LEGEND

- CLEAR CREEK CHANNEL PROFILE
- CONCEPTUAL IN-CHANNEL GRAVEL STORAGE
- GRAVEL ROUTING DOWNSTREAM
- GRAVEL SOURCES / INTRODUCTION

Gravel Augmentation

- Injection Method: **End-dump gravel into the channel.**
- Placement Method: **Contouring of the introduced gravel immediately providing a more natural channel morphology that is usable by salmonids.**



Management Strategy For Lower Clear Creek

- **Restoring equilibrium sediment storage conditions by a large initial “transfusion” of gravel, placed directly into the channel**
- **Maintaining equilibrium sediment conditions through periodic sediment introduction at specific sites along the corridor**



Whiskeytown



1998- CVPIA-4500 tons
1999-CVPIA-3500 tons
2000-CVPIA-3500 tons
2001-CVPIA-2500 tons

Focus is on
Spring Run
Chinook and
Central Valley
Steelhead

14,000 tons

Placer Road Bridge

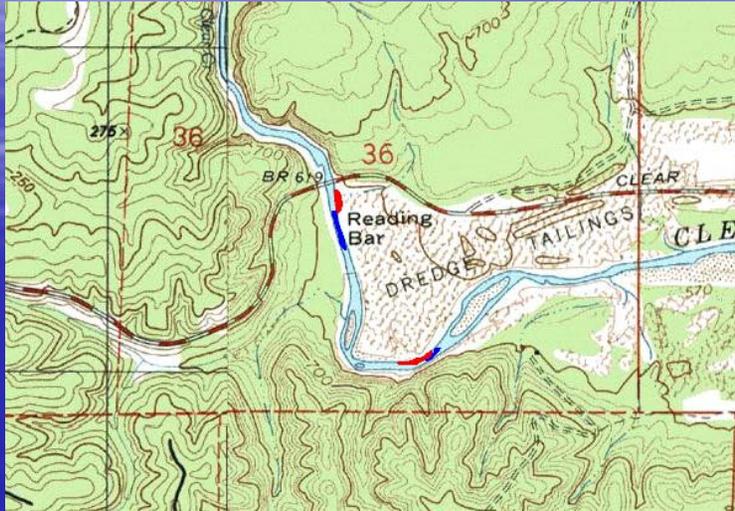


- 2000-CVPIA-3000 tons
- 2001-CVPIA-3000 tons
- 2003-CVPIA-3000 tons
- 2003 CVPIA-3000 tons

12000 tons



Reading Bar



- Gravel Injection and Placement
- New site in 2003
- Site 1 (Injection) located just below Clear Creek Road bridge
- Site 2 (Placement) located at the bottom end of the project footprint
- **2000 tons**

Saeltzer Gorge

1996-BLM-4500 tons

1996-USFWS-3000 tons

1997-CVPIA-3500 tons

1998-CVPIA-4500 tons

1999-CVPIA-4500 tons

2000-CVPIA-4500 Tons

2001-CVPIA-7000 tons

2003-CVPIA-3500 tons

35,000 tons

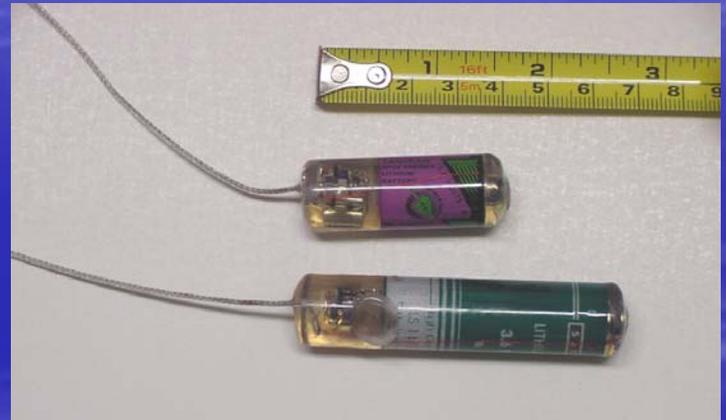


Upper Reaches of Lower Clear Creek Site Selection

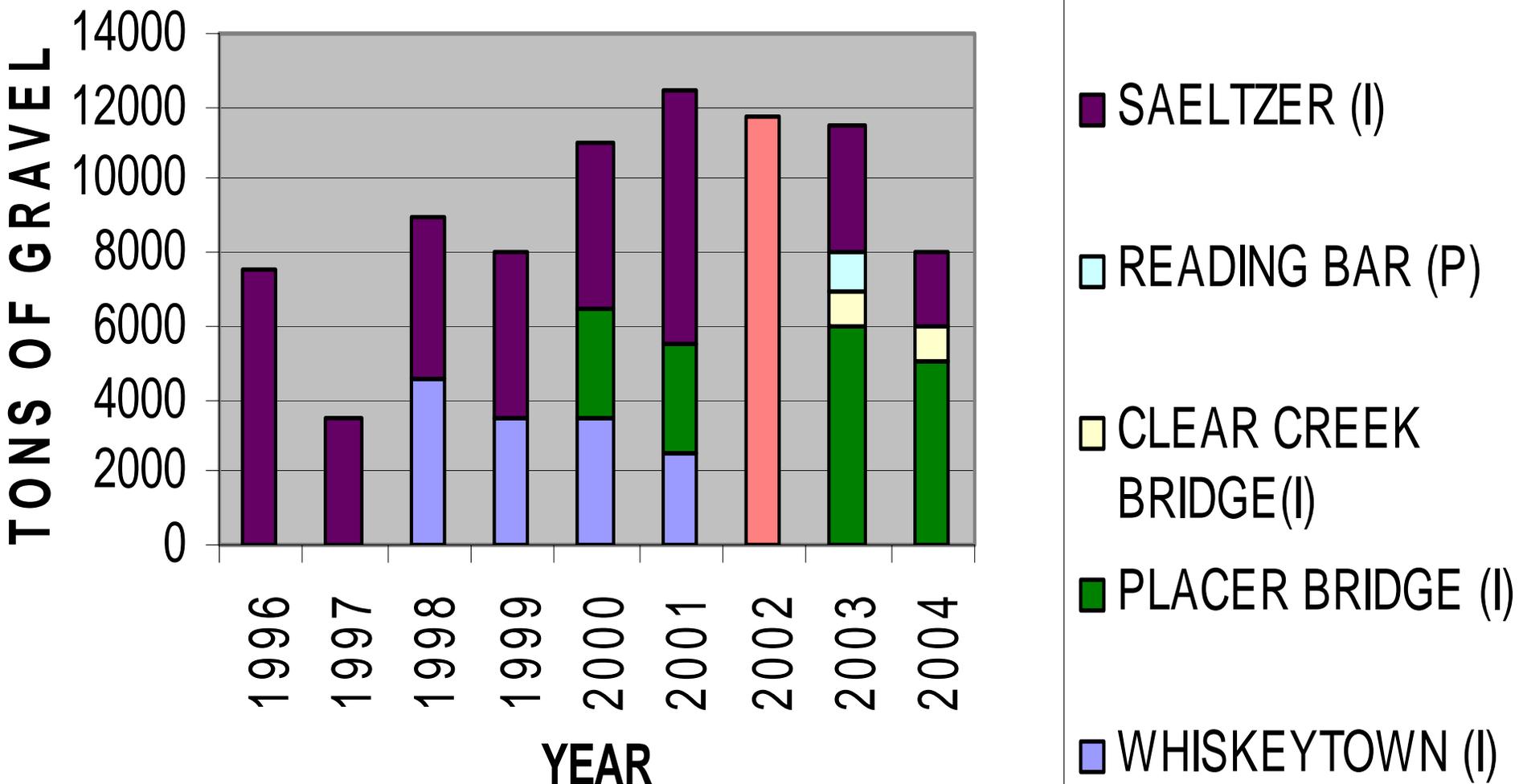
- Target Spring Run Chinook and Central Valley Steelhead
- Additional benefits
 - Gravel travels through entire system
 - Upper reaches have had very little coarse sediment input since the placement of Whiskeytown



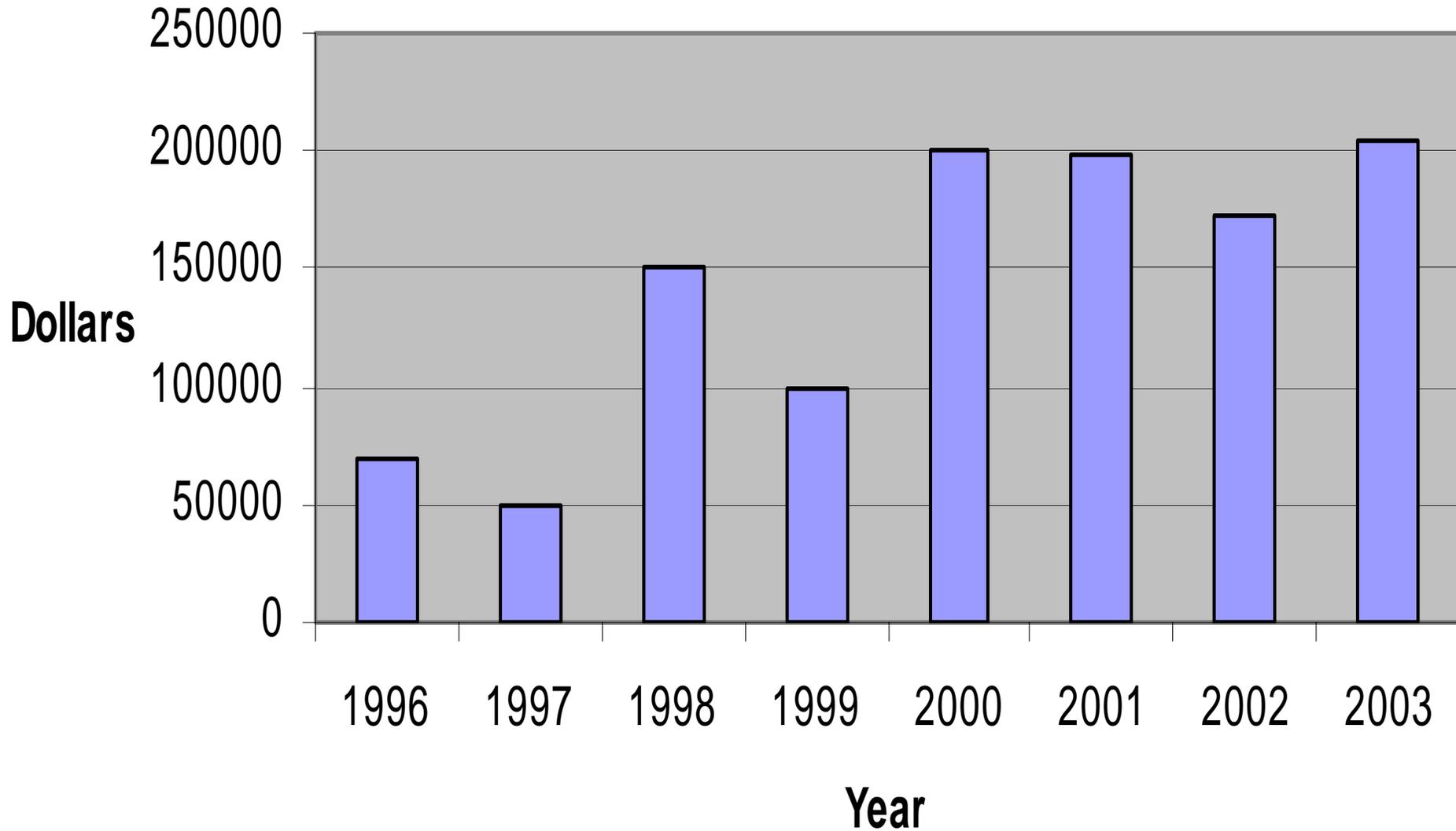
Monitoring Efforts



GRAVEL INJECTIONS ON LOWER CLEAR CREEK PER INJECTION SITE 1996 - 2004



Dollars Per Year Spent On Gravel Augmentation



Future Projects

- Design and implement the NEED Camp gravel Injection Site
- Develop placement sites in the upper reaches
- Gravel Management Plan (fall 2004)
 - **TASK 1: RE-OCCUPY M&T 2001 STUDY SITES**
 - **TASK 2: COLLECT STREAMFLOW/SEDIMENT TRANSPORT DATA**
 - **TASK 3: EVALUATE GRAVEL PLACEMENT METHODS AND VOLUMES**
 - **TASK 4: EVALUATE EFFECT OF SELTZER DAM REMOVAL ON SEDIMENT SUPPLY IN LOWER REACHES**

