Task Objective

• Compile and review bank protection revetment design in LAR.
• Update GIS database mapping revetment and include relevant design information
  – Relevant Design Info: Year constructed, rock size, rock toe, planting bench, location
Overall Objective

• Provide input to site characterization and risk.
  – Have site conditions changed since installation?
  – Is design sufficient for 160 kcfs event?
  – Is design sufficient for processes of concern?
Existing Data

- USACE GIS Database
- DWR ULE
- Ayers 2010 Stability Analysis
Existing Data

<table>
<thead>
<tr>
<th>Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>BANK_TYPE</td>
</tr>
<tr>
<td>LARGE_25</td>
</tr>
<tr>
<td>ROCK_12-20</td>
</tr>
<tr>
<td>LARGE_7</td>
</tr>
<tr>
<td>LARGE_15</td>
</tr>
<tr>
<td>LARGE_25</td>
</tr>
<tr>
<td>LARGE_30</td>
</tr>
<tr>
<td>LARGE_40</td>
</tr>
</tbody>
</table>

Legend:
- American River Miles
- HEC-RAS Cross Sections used for Levee Analysis
- 2015 MBN Erosion Sites
- BANK TYPE: rock, cement, cobble, natural, concrete rubble

DATA SOURCES:
- NAP Color Orthomagery, 2014
- Google Earth, 2012

nwc northwest hydraulic consultants
Existing Databases

- USACE GIS Database
- DWR ULE
- Ayers 2010 Stability Analysis
Existing Data

- Ayres (2010)

RM 7.3R - The armor along the right bank of RM 7.3R consists of rock riprap as shown in Figure 4.21. This site is across from the Fairbairn Intake Structure, and a hard point creates a peninsula into the river resulting in a constriction. Dense vegetation is upstream of the site and some vegetation is downstream of the site. Overall, the armor is in good condition and is roughly 2 to 3 ft thick. The rock on the upstream end of this site is buried by soil and densely vegetated.

Figure 4.21 - Armor Site at RM 7.3R
NHC Procedures

• Compile existing plan data from ARFCD, NHC archives
• Compare to existing databases
• Field verification (where possible)
Findings

- 1 Phantom sites
- Few undocumented sites
- “Bank paving” common in 1950s construction (cobble)
- Rock toe a common feature pre-2000
### Attribute Table

- **Plan Name**
- **Approximate Length**
- **Visible/Buried**
- **Plan Filename**
- **RM Start**
- **RM End**
- **Plan Year**
- **Designer**
- **Rock Location**
- **Left/Right**
- **Rock Type**

![Table](image-url)
Revised Map

Revetment Type
- Purple: Cobble
- Orange: Rock Riprap
Revised Map

Revetment Type
- Cobble
- Rock Riprap
Sac State 1967 Design
Sac State 1988 Design
Sac State 1998 Design
Sac State-2004 Design

Site 6.9 L @ 6+00

RESTORED GROUND
ROCK RIP-RAP
BEDDING
SUB-GRADE EXCAVATION
EXISTING GROUND
Ayers 2010 Bathymetric Survey Comparison
Questions?