

**Lower Feather River – Corridor Management Plan
Maintainer’s Meeting**

August 18, 2011, 1:30 p.m. – 3:30 p.m.
DWR Sutter Maintenance Yard

Participants:

DWR Division of Flood Management: Earl Nelson, Kelly Briggs, Keith Swanson

DWR FloodSAFE Environmental Stewardship: Tony Danna

DWR Sutter Maintenance Yard: Karen Hull, Joel Farias, Steve Beckley

RD 784: Steve Fordice

TRLIA: Paul Brunner

LD 1: Bill Hampton

cbec: Chris Campbell

AECOM: Steve Chainey, Susan Sanders

Introductions: After self introductions, Keith Swanson provided an overview of the purpose of the meeting; the goal is to get site-specific information and put on paper those activities that maintainers see as necessary on the Lower Feather River so that the CMP can reflect essential maintenance. Steve Chainey described how some of the information from this meeting will be incorporated into hydraulic modeling by cbec and MBK. Susan directed the participants to the white board, which listed the following activities/features that needed to be depicted on the color aerial photo maps of the Lower Feather River CMP:

1. Locations where vegetation removal is occurring, and where it should occur but is not because of various constraints (also need information on frequency of clearing, and nature of vegetation removal – clearing with equipment, sheep/goat grazing, etc.);
2. Areas of sediment and sand accumulation that create problems (e.g., sand bars directing flows against levees) and locations where sediment removal is happening or should occur to maintain floodway capacity;
3. Location of other problem areas (beaver dams, choke points, etc.);
4. Location of levee erosion or incipient erosion that will likely need bank protection over the next 25 to 50 years;
5. Locations where more road access is needed for levee inspection and maintenance activities;
6. Location of rock and gravel stockpiles for potential future flood fighting (likely to be on land-side of levee, but good to identify in the plan);
7. Input on other features that the Work Group has preliminarily marked on the map;
8. Other features to add to the map?

The group took the approach of discussing vegetation management, erosion and sediment problems on this 20-mile reach of the Lower Feather River by starting at the upstream end of CMP study area at the confluence of the Feather and Yuba rivers (Map 5) downstream to the river’s confluence with the Sutter Bypass (Map 1).

MAP 5: River Mile (RM) 28 to RM 24

Yuba River confluence, Shanghai Bend Unit, Shanghai Rapids, State Cut Channel, Eliza Bend, Old River Channel, City of Marysville Treatment Ponds and Linda County Water District Ponds

- **State Cut Channel Vegetation Management.** Steve B. said that the Sutter Maintenance Yard tries to annually clear out the vegetation (mostly fast-growing willows) through the State Cut channel, using a bulldozer to clear from bank to bank (approximately 150 feet). They pile the cleared vegetation and burn it. Fine sand builds up here too, and while there has been no sand removal by DWR, they try to smooth out areas with big depressions. Steve F. thought that a local landowner had been moving some sand out of the State Cut. Keith said there currently is no formal operations and maintenance manual for the State Cut channel work. Steve B. said the terrain was very rough out there, big mountains of sand with narrow channels, and they could not go beyond (downstream of) the Island Avenue crossing in their clearing. There is a lot of sediment here, and many small channels and ORV trails cutting through the high ground.
- **Origins of State Cut Channel.** No one at the meeting knew for certain the origins of State Cut; there was some discussion of the U.S. Army Corps of Engineers (COE) creating it in the 1950s. *[According to James et al. 2009¹ study, the State Cut and another abandoned bypass channel were created before 1906 based on records from California Debris Commission 1912.]* Bill said that the COE did extensive modeling out there when they were proposing straightening out Star Bend, around 1998 (Mussetter Engineers Inc.). Paul said that his understanding was that the State Cut was designed as a high flow channel, and that it still does likely serve that purpose. He suggested calling Joe Countryman (MBK, now retired) about it. Changes to this channel that increase flow may create opportunity for increased floodplain inundation for fishery enhancement, which Chris said they would be modeling.
- **Unauthorized Use of State Cut Channel Area.** Steve F. pointed out that if the State Cut were widened, unauthorized off-road vehicle use and trespass might increase. The nearby Shad Pad (a 16-acre Yuba County park in West Linda leased to E Street MX, a motocross company that has installed an off-road vehicle track) draws quads and other off-road vehicle users to that area. Other possible unintended consequences of opening up areas may be increased use by transients and unauthorized camping. Paul suggested that we first figure out flood control needs, then address ancillary issues such as unauthorized off-road vehicle use with a combination of engineering (e.g., rock weirs) and enforcement.
- **Other Erosion Problems?** Paul asked if there were any issues with the rivers being close to levees. Bill noted that on the east side of the river (right bank) there were no erosion problems. There used to be a bad spot behind the courthouse, but the COE repaired it in 1997. Bill said that there was no sign of river bank migration close enough to levee to threaten it and the levees were wide; farther downstream the river bank becomes more clay-like and naturally resistant to erosion. Bill said the levee used to follow Shanghai Bend, but in 1998 the levee was moved eastward to its current position. Old levee was eroding in 1997 before the other levee was built. Since the levee was relocated landward, the point bar at Shanghai Bend has been eroding and shrinking in size. Bill thought the river bed was being eaten away downstream at the Shanghai Bend rapids, and in a 1998 COE report hydrologists noted that in 10 years or so it might disappear. Chris said the consequence of losing that grade control would be about a 1-foot lowering of the stage upstream of Shanghai Rapids.

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Map 4 (RM 24 to RM 20)

Feather River Levee Setback Area [Messick Lake Mitigation Area, Marysville Yuba Mitigation Area], City of Marysville Treatment Ponds, Old River Channel, northern portion of Abbott Lake Unit.

- **Feather River Setback Area.** Paul said that the Three Rivers Levee Improvement Authority (TRLIA) has developed a management plan for the Feather River setback area. Sutter Butte Flood Control Authority (SBFCA) and TRLIA conducted hydraulic modeling for these areas based on the assumption that they would be planted as “dense riparian jungle”, and also took into account the new location of the setback levees. Most of the Feather River Setback area used to be a peach orchard, but now is bare, except for the VELB mitigation area and wetland mitigation (Messick Lake), as well as the levee/wave tree buffer that was planted. Paul said they have a network of security/ maintenance roads that are networked with some of the abandoned roads out there before, and includes the gravel paved levee roads. They are in the process of allowing limited public access, with an entrance point at Broadway Road. They also have trash pickup, and are planning signage and cameras for monitoring.
- **Planting Plans for Feather River Setback Area.** Keith noted that the Sutter Maintenance Yard would need guidance and clarity as to how to manage whatever is planted here. They might need to maintain conveyance channels (possibly planted as grass) if dense riparian vegetation is planted. Keith said that the area currently has features that would make it good Frequently Activated Floodplain (FAF) habitat for fish, with backwaters flooding up in the setback area to around RM 22. If this area was maintained as FAF, with low N values (low hydraulic roughness), that would provide more leeway for dense vegetation to occur elsewhere in the corridor. The restoration plan that was submitted for this area was dense riparian jungle, not FAF. The setback levee project was funded under the Early Implementation Project (EIP) and this program could allow for revision of the proposed planting if necessary.
- **Pump Station and Access Road.** Steve F. said that they will be putting in a pump station at Murphy Road to convey water in a pipe across the new setback levee (he drew this in yellow on the map), and it will flow into an old river channel. This is on leased ground. The road (new gravel road on footprint of old levee alignment) here is maintained for fire and other emergency access, and Paul said they use this same road for access to their mitigation sites and orchards.
- **Floodway Corridor in Orchard?** Keith discussed potential to create a managed floodway corridor in an area currently leased for peach orchards (Sharma is the leasee). An access control gate is needed here (Sharma lost \$80k worth of copper recently to theft), and COE may be willing to allow that gate.

Erosion Problem near RM 23. Bill noted a potential erosion problem on right bank on levee, with the channel migrating towards the levee around RM 23. This is a big sandy area, where the levee broke in 1944. Upstream of that is good, stable clay banks. Willows would not help for stabilization here.

Map 3 (RM 20 – RM 15.5)

Southern portion of Abbot Lake Unit, Star Bend Setback Area, Star Bend Unit, O'Connor Lakes Unit, Lake of the Woods Unit.

- **Abbot Lake Unit.** Bill said he could not speak to the vegetation management here because this is the center of an ongoing legal dispute with DFG regarding proposed restoration plantings. Bill would like to see more of the vegetation around Abbot Lake cleared out, and Keith said that they don't want to have restoration activities occur here and then have to clear it out later. Keith noted that there were concerns with erosion and sinkholes around RM 21, and about access for maintenance. Sinkhole issue will be addressed as a part of ongoing levee improvements. LD1 may approve DFG proposed restoration provided flood management concerns are addressed. (Reference attached September 1, 2011 e-mail exchange between Tina Bartlett regarding restoration and maintenance at Abbott Lakes.)
- **Regulatory Assurances.** Keith wants to make sure they have the ability to manage for public safety without providing for compensatory mitigation every time they conduct maintenance. Steve F. said that they would like to over-mitigate up front with overplanting, then when they take vegetation out to maintain the floodway they would not need to jump through permitting hoops. He was concerned about regulatory creep and wanted to know up front what the regulatory issues and sensitive resources are, without new ones being introduced (e.g., tricolored blackbirds, cottonwoods are now raised as concerns). Steve F. also mentioned the need to have flexibility and upfront assurances in making decisions for staff and public safety - for example, if there is a widow-maker tree or snag that needs removal to protect their maintenance staff, then they want the process for doing that well-defined and easy to implement. Keith said that assurances are needed to allow necessary maintenance, and ideally they would have a trade off with areas of extra vegetation compensating for areas that may need to be cleared. Steve C. noted that it was also important to look at former orchard areas that may not be managed in future years and the types of vegetation that would be anticipated growing in these areas over time.
- **O'Connor Lakes.** Clearing a new floodway corridor in this area began about 5 years ago. Karen said that they manage about 600 feet and would like to do more. They used to maintain a perimeter road, and at some point began putting some strips in for more access, then got approval to open up the corridor more. Keith would like to see the O'Connor Lakes restoration project bundled with mitigation. Karen would like to get some results from MBK to better determine the appropriate width of the floodway swath to allow for high stage flows to move through this area. Resource agencies (and flood control) would like to see high water stage be able to flow through the O'Connor Lakes area. Bill said that in the high water of January 2006 the new floodway corridor worked perfectly, as evidenced by patterns of sand and sediment deposition, and it relieved the pressure on 784 levees adjacent to the corridor. Bill also mentioned some erosion on the right bank at Star Bend Setback Area, where it has eroded 6 feet in 3 years. He thought they could create a pathway for high water by creating a nick point, which would take pressure off the left bank. Bill said that the cultural resources in this area, close to where a nick point would be, are already well protected with resistant clay banks.
- **Back Channels at Levee Toe.** Old, historic borrow areas for the levees, created with steam shovels, have created depressions that hold water permanently at the levee toe. Chris asked are

there concerns about these back channels undermining the levee integrity? Keith said they were a problem on levees on the Sutter, Yolo, and Sacramento bypasses where channel slopes are eroding back toward the levees. Beaver and otters use the ponds for habitat, and sometimes they burrow into the levee. Bill thought that the beavers were the problem rather than the water. The beavers den up underneath the toe road, which then creates a sinkhole when they collapse. He said the COE has some geotechnical folk who could help figure out the problem, using soundings and digging them out. URS is doing a study of that right now. Steve noted that some of the back channels have plugs at the outlet (e.g., old culverts that filled in with sediment) and that it might be better for avoiding fish entrapment and beaver problems if they were partially drained to the original swale grade. Bill noted that the Abbot Lake area drains, but the borrow ponds at O'Connor Lakes do not. Bill said one issue with having them drain was that the channel tends to move and expand width-wise with time, and might expand toward the levee.

- **Beavers.** Steve F. said he had a lot of beaver issues, and Karen noted that DFG does not relocate problem beavers. Steve F. said he thought they come from the Bear River, and he needed a larger depredation permit, something like 100, rather than the 20 his district is typically allotted.
- **Star Bend Flood Fighting Cache.** Steve F. mentioned that he hoped to build a stockpile location and regional flood-fight cache at Star Bend. Mainly stocked with equipment, sand bags and gravel, more for fighting boils rather than building up levees. He will also be seeking contracts ahead of time (for example, Teichert trucks, emergency lighting) so those arrangements are made before a flood emergency occurs.

Map 2 RM 15.5 – RM 12

Southern and central portion of Lake of the Woods, northern portions of Bobelaine Audubon Sanctuary and Sheiber Ranch, Bear River Setback Area, and confluence with the Bear River,

- **Lake of the Woods.** Karen said they used to just bulldoze alternating strips about 75 feet wide. Now they do a bit of dozing, but also have it under a grazing contract with sheep and goats (¾ goats, ¼ sheep) but still need to have a mechanical component even with grazing. Extensive mowing is needed because of the thickets of willows, berries, wild grape; they use 'Rhino' mowers and a mulcher (front-mounted flail mower). The sheep are pretty selective and won't eat brush, whereas goats eat everything. They like to graze on the levee, and particularly like the Bear River plantings, as well as elderberry shrubs. Keith said they would like to have a better hydraulic model basis for their vegetation maintenance out there so they can figure out what is really needed. Karen said they do not do any sediment removal here, just smoothing out depressions. They used to disc it as well, but now they just mow and it holds the soil better. Steve C. asked if they had reached accommodation with DFG on vegetation clearing, and the reply was that DFG likes the access that the mowing provides for hunters.
- **Elderberries.** Steve C. asked if elderberries and VELB are a problem. Karen said they were, and that they have to avoid them with a 100-foot buffer. Kelly's staff and environmental crew flag them, and the maintenance staff can recognize them also. The main problem with inadvertent loss of elderberries is if they are covered with grapes and berries and crews do not see them when they are clearing.

- **Other Maintenance Issues.** They only clear vegetation 10'-15' off the toes of levees, but need to have closer to 50 feet clear, and avoid having big trees cascading over the levee. They try to keep a toe road as area of demarcation. On Pump Station 2 on outfall (up from confluence of Bear River) they have a difficult time maintaining flow here. Steve F. said they spend \$3,000 – \$4000/month for pumping at this station, and they need access over the top of the levee to keep the drainage channel clear of vegetation. A suggestion at the meeting is to relocate the channel eastward directly to the river which would create a much shorter channel and much easier to maintain. Bill said the river is migrating to the east here (left bank erosion). Steve C. asked if DWR ever skims sand bars, and Keith said not, they have too many other demands on their maintenance time. Paul noted that TRLIA has an O&M manual for the Bear River Setback Area.

Map 1: RM 12-RM 7.5

Nelson Slough Unit, southern portions of Bobelaine Audubon Sanctuary and Sheiber Ranch, and confluence with the Sutter Bypass

- **Nelson Slough:** Sediment has built up 8 feet or higher on the backside of the boulders (rock weir). Currently they remove vegetation at Nelson's Slough every year or every other year, and also do tree thinning along the rock weir, as well as spraying herbicide. Sheep and goat grazing occurs there as well. DFG (Dale Whitmore) would like them to mow different areas. DFG currently has a proposal to do restoration at Nelson's Slough. Keith said they need to manage vegetation, debris, and possibly sediment in this area. Need to look at LiDAR topographic data to see what is needed for sediment removal at Nelson's Slough. He also expressed concern about plantings too close to the road. Steve C. asked about the minimum clearance width needed to avoid debris dams, and the reply was that 50 feet was the bare minimum, larger is better. Big tree snags tend to capture debris.
- **Sutter Bypass.** In the Sutter Bypass they will need to do more maintenance. Keith Swanson said that Nelson Slough Rock Weir was constructed to help prevent the Feather River from migrating to the north. Bill said the training levee south of the rock weir used to be the old railroad track causeway. Keith indicated DWR is getting written up when vegetation grows here as if it is a levee. They are currently doing 2D modeling right now in the Sutter Bypass; don't know if maintenance is sufficient there. They went from 6 to 5 feet of freeboard. Results should be available in a couple of months as to whether more thinning is needed.
- **Bobelaine Audubon Sanctuary.** They used to do some clearing in the Audubon Bobelaine Sanctuary, but stopped in the early 1990s because of environmental concerns. A fire occurred here (presumed set from a beached boat) and burned a lot of mature forest vegetation.

ⁱ James, L.A., Singer, M.B., Ghoshal, S., and Megison, M., 2009, *Historical channel changes in the lower Yuba and Feather Rivers, California: Long-term effects of contrasting river-management strategies*, in James, L.A., Rathburn, S.L., and Whittecar, G.R., eds., *Management and Restoration of Fluvial Systems with Broad Historical Changes and Human Impacts: Geological Society of America Special Paper 451*, p. 57–81, doi: 10.1130/2008.2451(04).