

LITTLE CHICO CREEK 21ST CENTURY MANAGEMENT PLAN (SWRP PROJECT N)

General Project Information:

This project includes a plan to manage the Little Chico Creek watershed as a holistic system. The public will be encouraged to participate in the development of the plan through identification of problems to be addressed in the plan and providing input on the identified causes/and recommended solutions to the problems. The plan development will be coordinated with the City of Chico (City), Butte County, the California Department of Fish and Wildlife, California Department of Water Resources, the US Army Corps of Engineers, and other appropriate agencies. The plan will include at least the following topics:

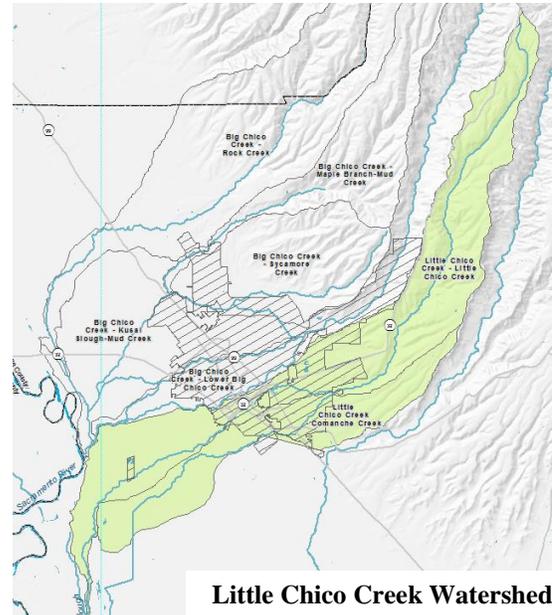
- **Flooding:** The plan will assess existing and buildout flooding, identify the causes of the flooding, and develop solutions to reduce or eliminate the flooding. Surveying, geographical information system mapping, and topographic mapping will be used to collect data for existing conditions. The study will cover Little Chico Creek from upstream of the City through the City to River Road or Ord Ferry Road. The study will identify capacities of culverts, bridges, levees, and other conveyance facilities and will compare the capacities with the design storm flows to identify flood risks along Little Chico Creek. Computer-based hydrologic and hydraulic modeling will be used to evaluate one historical storm event and the 2-year, 10-year, and 100-year storm design storm events. Flows and water surface elevations will be identified and the current floodplain will be delineated for each design storm. Stage and flow gages with telemetry can be used to record actual flow data and an existing stream gage can be improved to measure flood flows. The flood flow data can be used for “real-time” management of flood warnings and flood management operations. There is currently a flood flow gaging station on Little Chico Creek at Taffee Avenue that was recently upgraded and will be used by DWR to collect data for one year. After one year, another organization will need to operate the gage. Additionally, M&T Ranch has flow data for Little Chico Creek dating back to the 1990s. This flood flow data will be used for the hydraulic model calibration and for planning and sizing flood control improvements.

Future land uses based on the City’s then-current general plan will be incorporated into the model without mitigation to document the impacts of future growth on Little Chico Creek through and downstream of the City. Flood control improvements such as detention basins; enlargement of channels, floodplain restoration, bridges, and culverts; low impact development (LID) techniques; and other structural and non-structural approaches will be identified. The flood control improvements will prevent increased flooding through and downstream of the City. The flood control improvements will ensure that the flood flows are not simply conveyed through the City and onto downstream properties. Flows and water surface elevations will be identified and the floodplain will be delineated for each design storm for buildout land uses. Cost estimates will be prepared for the recommended flood control improvements that could serve as a basis for a Capital Improvement Plan and development impact fees to ensure the flood control improvements can be funded and constructed. Some possible solutions include evaluating and adjusting the gates at the diversion from Little Chico Creek into Butte Creek at Stilson Canyon Road. The potential for LID techniques to help reduce flood flows will also be specifically evaluated.

- **Water Quality:** Opportunities for LID techniques will be identified, including in the Chapman/Mulberry neighborhood, Cal Park, and elsewhere. LID techniques that will be evaluated include pervious pavement, infiltration trenches, vegetated buffer strips, bioretention, media filters, constructed wetlands, and green streets. LID will improve water quality by reducing pollutants and runoff entering Little Chico Creek. Additional, nonstructural techniques to improve water quality through public education will be evaluated in the plan, including providing water quality public education workshops. The plan will also identify opportunities to collaborate with existing watershed protection groups, such as Butte Environmental Council, Stream Team, etc., to evaluate the efficacy of the projects for improving water quality. If flood control detention basins are needed, they will be designed to also provide water quality treatment.
- **Water Supply:** Opportunities to increase groundwater recharge will be evaluated. Several open space areas have been identified as potential infiltration sites, including city property just downstream of the diversion into Butte Creek at Stilson Canyon and at the property north of the Boucher Street Bridge.

The potential for storm water capture and reuse projects will be identified and evaluated, which could reduce demands on the potable water system. For example, enlarging the existing 12-inch culvert under Highway 99 to flowing to Dead Horse Slough (between Humboldt Ave and East 10th Street) would allow more flow to reach Dead Horse Slough, where the flow could infiltrate and recharge groundwater. Similarly, this enlarged pipe would reduce the flow that reaches Little Chico Creek, contributing to reduced flood potential along Little Chico Creek downstream of highway 99. If flood control detention basins are needed, they will be designed to also provide infiltration.

- **Recreation:** Recreation opportunities will be identified; such as pedestrian and bike trails, parks and sports fields located in or adjacent to detention basins or LID projects, paths along the creek, and wildlife viewing. The plan will emphasize community input on recreational opportunities.
- **Gravel, Erosion, and Sediment Management:** The plan will include a comprehensive gravel, erosion, and sediment management evaluation. Management of gravel, erosion, and sediment is critical to protect and improve the quality of the Little Chico Creek habitat. Areas of erosion along the banks and bed of Little Chico Creek will be mapped. Solutions to control the erosion and reduce the sediment in the creek will be developed. Several erosion areas of concern include the Walnut Street Bridge and downstream of the Chestnut St. Bridge.
- **Ecosystem:** The plan will also evaluate the ecosystem health and identify ways to improve the ecosystem; including management of gravel and sediment deposition, evaluation of the health of floodplain habitats, removal of invasive plants (such as *Arundo donax*), planting of native plants, and protection of endangered species such as the Valley Elderberry Long-horned Beetle. The water quality impacts and management approaches of illegal camping (such as disposal of human waste, sharps, and other biohazards) along waterways will be identified. The plan will identify approaches for long-term monitoring of ecosystem health using citizen monitoring and involvement where appropriate.
- **Public Outreach and Education:** The plan will summarize existing education and outreach programs and will evaluate improvements to these existing programs to protect watershed health, including in disadvantaged communities. Examples of existing programs include the Clean Water Science Ambassadors, Clean Creeks in the Classroom, and the Citizen Monitoring Program. This plan will involve preparing an education and outreach plan and budget that includes: 1) opportunities to collaborate with existing watershed protection groups, such as Butte Environmental Council, Stream Team, Friends of Bidwell Park, *etc.* 2) evaluates and monitors the efficacy of the projects for reducing erosion and improving water quality, and 3) provides public education and outreach events. Some topics for education include residential landscaping to conserve water, dry weather runoff capture, river-friendly landscaping, and residential pesticides and fertilizer management.
- **Funding:** Existing storm water programs will be integrated into the projects where applicable, and where appropriate, grant program local match funding requirements can be met by volunteer hours. The plan will also identify specific project elements and programs that can be implemented relatively easily and at relatively low cost.
- **Watershed and Location:** This project includes the entire Little Chico Creek Watershed.
- **Watershed Area:** Little Chico Creek watershed is approximately 42,091 acres.



Little Chico Creek Watershed

Benefits Resulting from this Project

When the Little Chico Creek 21st Century Management Plan is fully implemented, the following benefits are expected to occur:

- **Water Quality:** Water Quality is expected to be improved because implementing LID and minimizing erosion and scour will reduce the amount of sediment and other pollutants in receiving waters.
- **Water Supply:** Water supply is expected to be improved because implementing infiltration areas will allow some flows to recharge groundwater.
- **Flood Management:** Flood Management is expected to be improved because solutions identified in this plan will help reduce flooding problems.
- **Environmental:** The environment is expected to be improved because implementing this plan will help manage sediment and gravel, remove invasive species, plant native species, and improve aquatic habitat.
- **Community:** The community is expected to be improved because the plan enhances recreational opportunities and expands education and outreach opportunities regarding storm water.

Project Costs

- **Estimated Plan Preparation Cost:** The estimated cost of preparing this plan is \$TBD. This cost does not include the costs of designing and constructing the improvements that will be identified in the plan.

Photos:



The Chestnut Street Bridge at Little Chico Creek has been identified as an area with erosion problems. The plan will identify why erosion occurs and solutions to reduce erosion and scour. Imagery: Sept 2017, Google © 2018



Diversion gates from Little Chico Creek to Butte Creek needs to be adjusted to optimize flood protection.

Imagery: Google © 2018, Map Data: Google © 2018

Initial Projects Included in this Plan:

This project includes the following Initial Projects in whole or in part:

- SWRP 3: 21st Century Management Program: Little Chico Creek to Butte Creek Diversion
- SWRP 10: Little Chico Creek Flooding Problems
- SWRP 11: Little Chico Creek Water Quality
- SWRP 18: Detention Basins on Little Chico Creek
- SWRP 21: Make City Corp Yards Storm Water Friendly
- SWRP 69: Multiple Off-Stream Detention/Wetland Basins
- SWRP 72: Revised Chapman/Mulberry Neighborhood Green Infrastructure and Natural Storm Water Treatment Project
- SWRP 74: (Revised) Cal Park Green Streets Project
- SWRP 76: Revised Little Chico Creek, Lindo Channel, Mud/Rock Creek Arundo/Broom Removal and LID Implementation Project
- SWRP B: Little Chico Creek Watershed Wide Flood Control, Urban Drainage, Habitat, Public Open Space/Recreation Management Plan
- SWRP D: Creek Bank and Bed Stabilization Plan and Specific Projects
- SWRP E: Homeless Camping Reduction Program
- SWRP J: Detention Basin Implementation and Modification Plan
- SWRP K: Habitat Improvement Plan and Specific Projects