

# Section 4

## Options

The Plan identifies 30 options that may help to meet Butte County objectives. An option, in the context of this Plan, is a project, program, or policy that could be implemented to help meet the County’s future water management needs. The Study Team developed options through discussions with the Steering Committee, interviews with the DW&RC, and research of past and ongoing studies. This section presents the options, and Section 5 discusses how these options were grouped into packages, as well as how these options contributed to recommendations. The Study Team and the Steering Committee used the development and evaluation of options and option packages to identify potential policies, which represent patterns of actions that Butte County can take with respect to integrated resources management. These policies are the ultimate outcome of the planning process described herein; the options are included both to illustrate the development of the policies and to identify the actions that may be accomplished if the policies are approved.

### 4.1 Option Categories

The Plan options are grouped into six categories relating to their function. The following sections briefly discuss the option categories. Appendix F includes complete descriptions and potential benefits and drawbacks of each option.

#### 4.1.1 Environmental

This category includes options that address environmental concerns in Butte County relating to special status species habitat, water quality, and environmental water demand. Water resources-related actions that benefit environmental resources generally fall into three categories: 1) increasing flows to improve habitat; 2) restoring

##### Environmental

- Option 1: Increase fish flows in Upper Butte Creek
- Option 2: Increase fish flows in Lower Butte Creek
- Option 3: Restore a more natural flow regime on the Feather River
- Option 4: Develop a coordinated water quality database
- Option 5: Develop a coordinated and expanded water quality monitoring program
- Option 6: Implement an environmental monitoring program
- Option 7: Provide guidance in development of basin management objectives that support vegetation

more natural flow patterns in rivers and creeks; and 3) increasing understanding of water quality and environmental resources.

The County has several creeks and rivers that provide habitat for special status species. Diversions from these water bodies decrease flows during fish migration and affect riparian habitat for other special status species. Increasing flows has the potential to benefit these fish and riparian species.

Before construction of water storage and conveyance facilities, waterways had increased flows during the winter and spring because of precipitation and snowmelt. Several waterways within Butte County have facilities that change flow patterns to provide more flows during the summer for water supply. Fish and riparian vegetation historically used flows to cue various behaviors, such as spawning and migration. Changing flow patterns at certain times of year to more closely resemble a natural flow regime could help these species by triggering these behaviors.

Other options in this category propose to improve the understanding of the County's water quality and environmental resources. Increasing monitoring would help the County understand surface and groundwater quality, and how the quality affects both environmental resources and water supplies. Environmental monitoring would allow the County to increase its understanding of environmental resource needs. In addition, relicensing of the hydroelectric facilities on Butte Creek and the Feather River is heightening environmental awareness.

#### Water Use Efficiency

- Option 8: Expand urban water use efficiency measures
- Option 9: Expand agricultural water use efficiency measures
- Option 10: Inform and educate the public about water

### 4.1.2 Water Use Efficiency

Increasing water use efficiency can provide additional available supply for future drought protection or other in-County beneficial uses. Public education would help people understand the effects

of their actions on water quality and quantity, and understanding these effects could lead to more efficient practices. The County or local water districts could work with the California Urban Water Conservation Council, the Agricultural Water Management Council, or CALFED to implement efficient water management practices. In general, most urban and agricultural water use efficiency efforts would have granted funding opportunities.

### 4.1.3 Ridge Supplies

This option category proposes projects to address potential future water shortages in the Ridge communities, including the Town of Paradise and surrounding developments. The Ridge area has a growing population and the water supply must be increased to meet future needs, particularly during dry years. The Ridge area water purveyors are investigating options to increase supplies, and the options within this Plan are derived from those local investigations. Two of the options would convey water to the area by utilizing the County's SWP allocation, while the others would provide additional storage by strengthening or raising existing dams.

#### Ridge Supplies

- Option 11: Divert water from Miocene and Hendricks Canal to supply the ridge
- Option 12: Build the Lime Saddle Pipeline to deliver water to the ridge
- Option 13: Strengthen Magalia Dam to increase storage capacity
- Option 14: Raise Paradise Dam to increase storage capacity

#### Coordinated Management

- Option 15: Implement a coordinated management program
- Option 16: Identify and deepen shallow groundwater wells
- Option 17: Build a canal to deliver surface water to Cherokee and Esquon
- Option 18: Build the Oro-Chico Conduit for in-lieu and direct recharge in Cherokee and Esquon
- Option 19: Construct groundwater recharge basins
- Option 20: Investigate a storage reservoir in Table Mountain's former basalt mine
- Option 21: Enhance natural recharge from local waterways through environmental restoration activities
- Option 22: Expand groundwater level and extraction monitoring

### 4.1.4 Coordinated Management

Coordinated management of groundwater and surface water enables better management of both resources. This category would help manage groundwater fluctuations to ensure future County water supplies. Coordinated management includes several components: 1) recharge, or placing water in the aquifer; 2) monitoring groundwater levels, groundwater quality, and subsidence; and 3) recovery of water from the aquifer. A coordinated

management program would provide a beneficial use for the County’s unused SWP allocation, increase the reliability of groundwater supplies, and provide economic revenues to the County if water were sold outside the County.

### 4.1.5 Policies

The policy options propose to improve water management within the County, address regional water issues, and improve the County’s water quality. These options do not identify on-the-ground projects, but rather identify policies that the DW&RC could adopt to help meet the planning objectives.

The DW&RC could improve water management by forming a new agency to manage groundwater replenishment or committing to regularly updating water-related plans, ordinances, resolutions, and policies. Regionally, Butte County could cooperate with the Butte County RCD and neighboring counties in groundwater outreach and watershed efforts. The County could also enact policies to benefit groundwater quality (by limiting activities within recharge zones) and surface water quality (by requiring best management practices, especially in new developments).

Implementation of the policy options would require the DW&RC to work together with watershed groups, the RCD, and neighboring counties to improve management of shared resources.

Policies
■ Option 23: Create a groundwater replenishment district
■ Option 24: Protect recharge area water quality through zoning
■ Option 25: Commit to a periodic and coordinated update of water management plans, ordinances, resolutions, and policies
■ Option 26: Initiate a multi-county cooperative outreach effort
■ Option 27: Increase the support for Butte County Resource Conservation District
■ Option 28: Coordinate regional watershed management
■ Option 29: Support restoration of a more natural flow regime on the Sacramento River

### 4.1.6 SWP Allocation Management

SWP Allocation Management
■ Option 30: Improve management of unused SWP allocation

This category includes one general option to develop a mechanism for managing the unused portion of its SWP allocation. The County could use the allocation as part of other options, many of which rely on a portion of the SWP allocation for implementation. Another

potential use of the allocation is to transfer it outside of the County, a practice for which the Monterey Amendment specifies strict terms. The County is exploring alternatives to its current SWP contract that would allow the unused allocation to be utilized in a manner that would provide benefit to the County.

## 4.2 Option Screening

The options summarized in Section 4.1 above include those that survived the option screening process, which used the following criteria:

- Technical – Is the engineering feasible?
- Legal – Is the option legal?

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- Political – Is the option politically acceptable?
- Financial – Is appropriate funding likely to be available?
- Environmental – Is the option environmentally feasible?
- Benefits – Does the option provide substantial benefits?

The Steering Committee compared each option to each screening criterion. If the option did not meet all criteria, it was removed. Table 4-1 reflects the results of this screening process. On the table, an “X” indicates that a criterion was not met and the option was screened out of the process.

**Table 4-1  
Option Screening**

	Option Number/Name	Screening Criteria						Notes
		Technical	Legal	Political	Financial	Environmental	Benefits	
Environmental	1. Increase fish flows in Upper Butte Creek							
	2. Increase fish flows in Lower Butte Creek							
	3. Restore a more natural flow regime on the Feather River							
	4. Develop a coordinated water quality database							
	5. Develop a coordinated and expanded water quality monitoring program							
	6. Implement an environmental monitoring program							
	7. Provide guidance in development of basin management objectives that support vegetation							
	• Increase flow on Big Chico Creek	X						Big Chico Creek does not have upstream storage facilities or diversions that could be reoperated to increase flows
Water Use Efficiency	8. Expand urban water efficiency measures							
	9. Expand agricultural water efficiency measures							
	10. Inform and educate the public about water							
	• Meter water use in Chico						X	Redundant to expand urban water use efficiency measures option
Ridge Supplies	11. Divert water from Miocene and Hendricks Canals to supply the Ridge							
	12. Build the Lime Saddle Pipeline to deliver water to the Ridge							
	13. Strengthen Magalia Dam to increase storage capacity							
	14. Raise Paradise dam to increase storage capacity							
Coordinated Management	15. Implement a coordinated management program							
	16. Identify and deepen shallow groundwater wells							
	17. Build a canal to deliver surface water to Cherokee and Esquon							
	18. Build the Oro-Chico conduit for in-lieu and direct recharge in Cherokee and Esquon							
	19. Construct groundwater recharge basins							
	20. Investigate a storage reservoir in Table Mountain's former basalt mine							
	21. Enhance natural recharge from local waterways through environmental restoration activities							
	22. Expand groundwater level and extraction monitoring							
	• Divert water from Miocene Canal to Dry Creek for groundwater recharge						X	Redundant to Option 21 (enhance natural recharge)
	• Construct tanks to store extracted groundwater				X	X		Above-ground storage is expensive and not necessary; the groundwater aquifer can function as a storage facility
• Retire land in recharge areas			X				County residents would likely not accept retiring land over recharge areas	
• Adjudicate groundwater basin			X			X	Adjudicating the groundwater basin would be unpopular and would not benefit County residents	
Policies	23. Create a groundwater replenishment district							
	24. Protect recharge area water quality through zoning							
	25. Commit to a periodic and coordinated update of water management plans, ordinances, resolutions and policies							
	26. Initiate a multi-county cooperative outreach effort							
	27. Increase support for the Butte County Resource Conservation District							
	28. Coordinate regional watershed management							
	29. Support restoration of a more natural flow regime on the Sacramento River							
	• Establish a no-growth policy for cities			X				Cities would not be likely to accept no-growth policies
	30. Improve management of unused SWP allocation							

X Option is unacceptable in this category