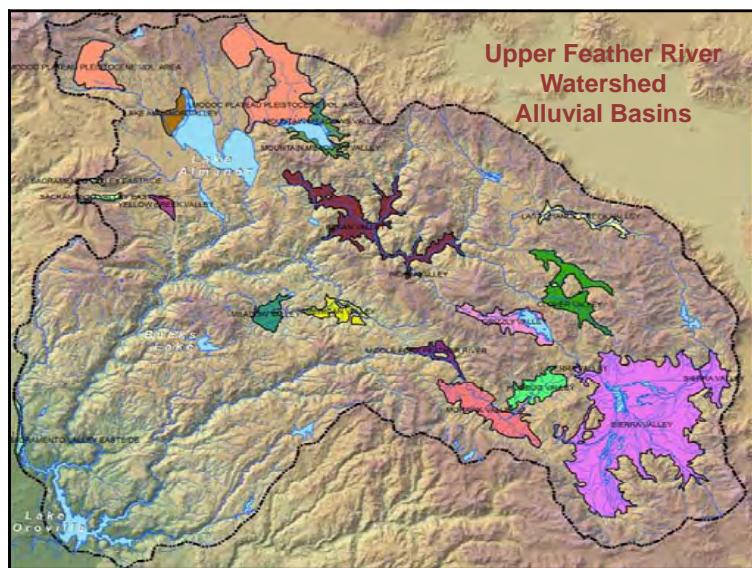
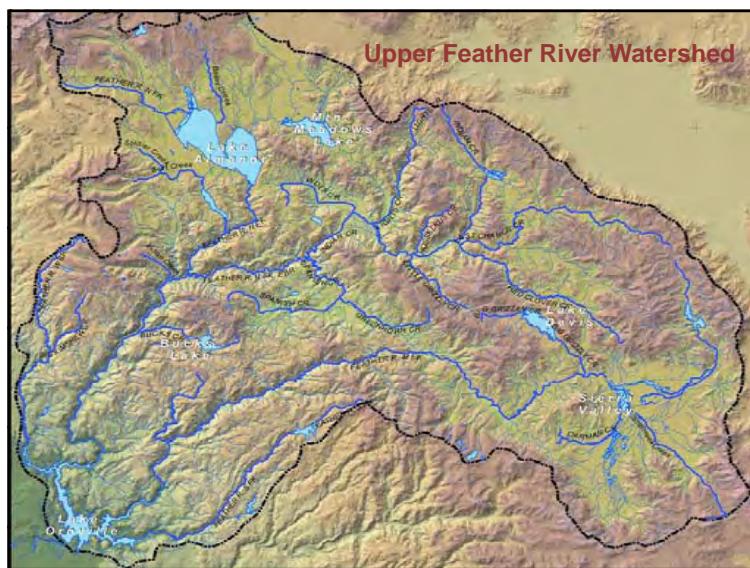
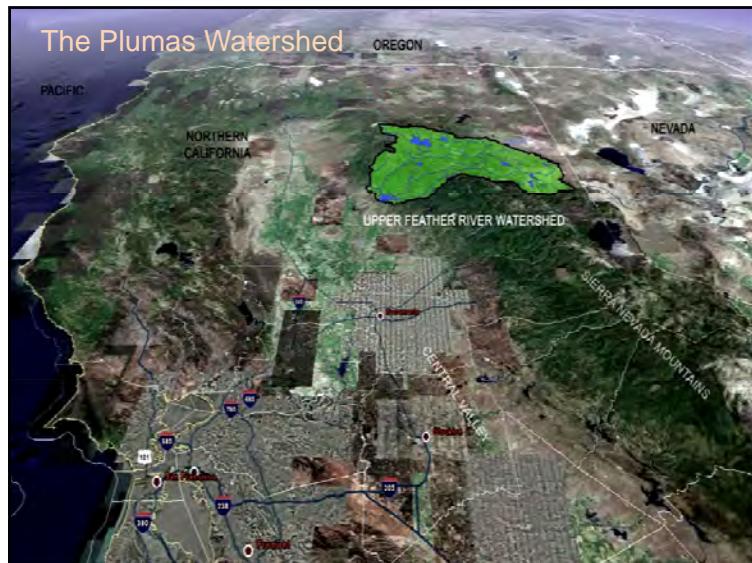
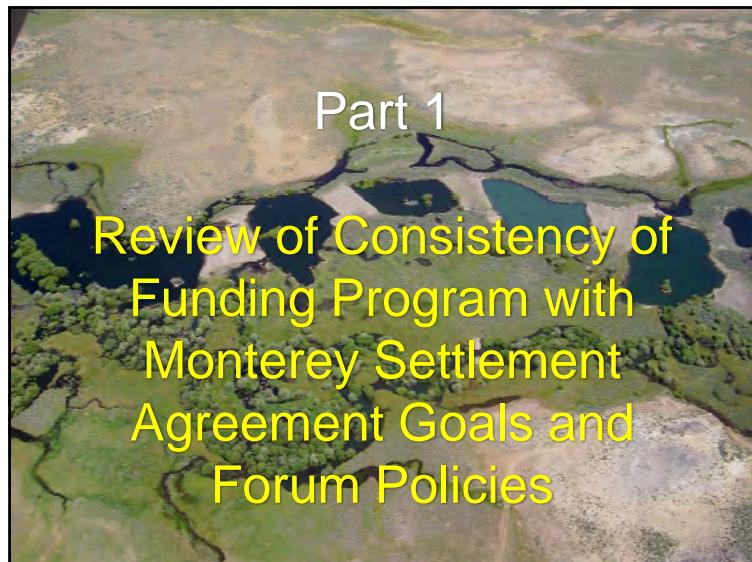
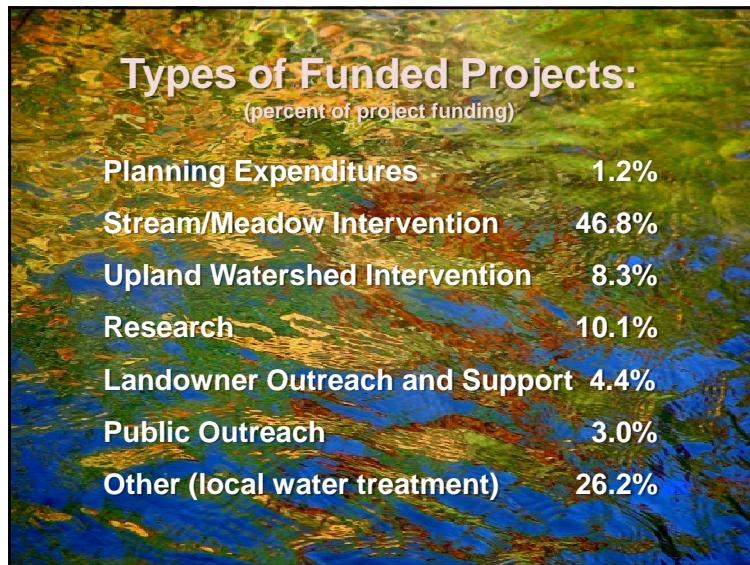
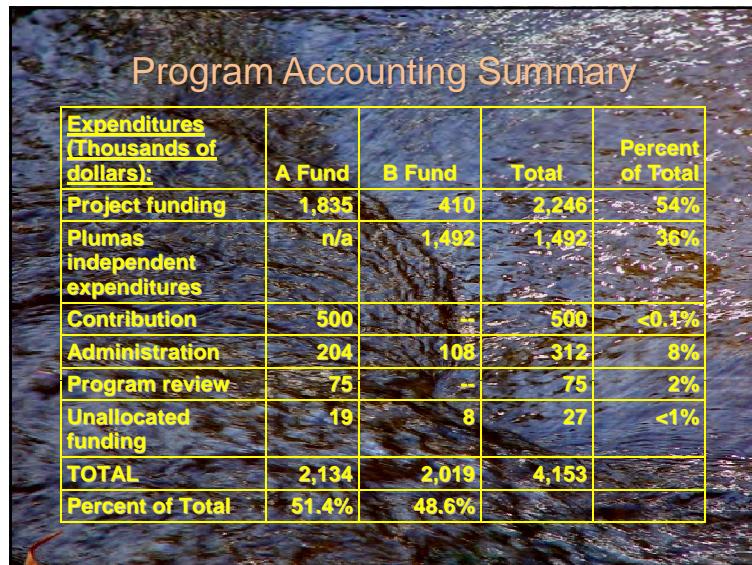
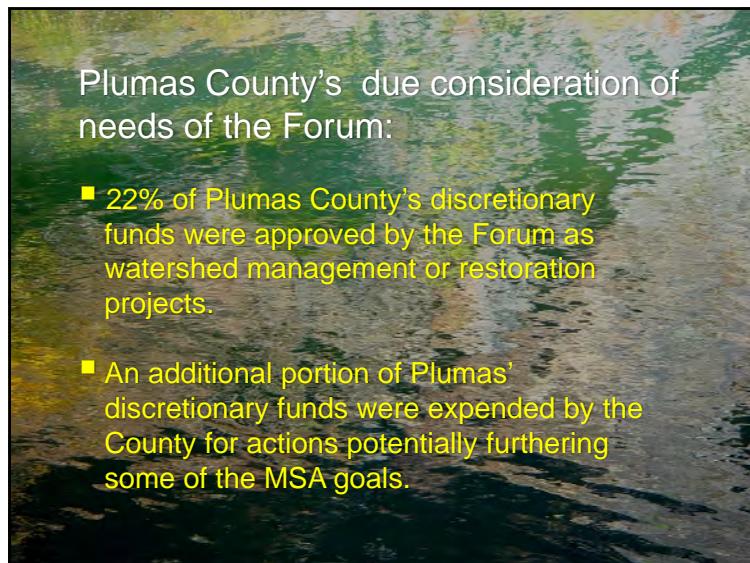


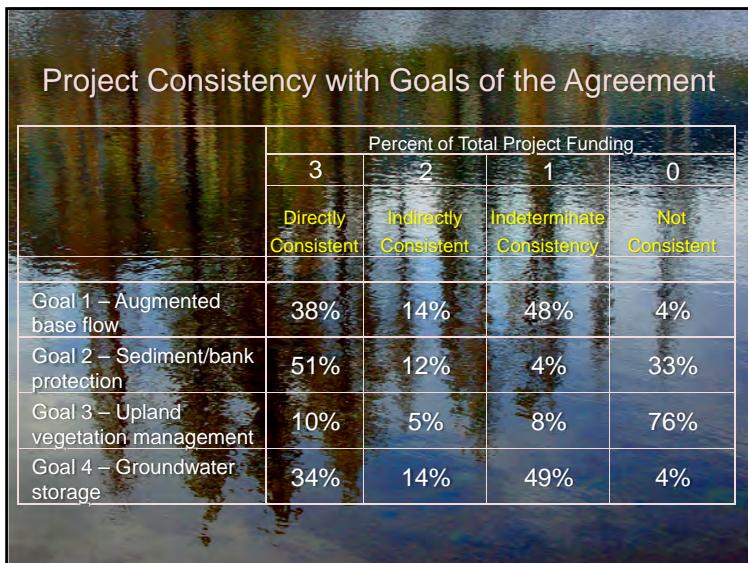
Plumas Watershed Forum Program Review

May 2008



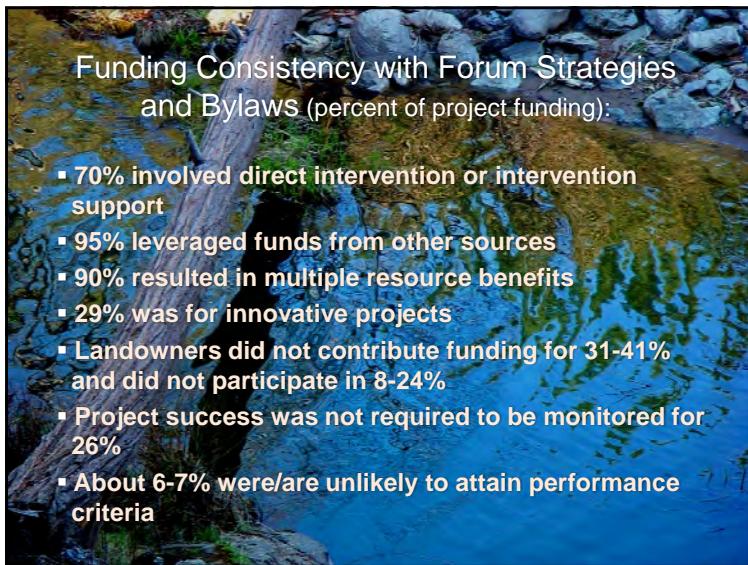






Project Consistency with Goals of the Agreement continued

- One-half of project funding directly or indirectly furthered Goals 1 and 4 – increased groundwater storage and augmented baseflow
- More than one-half (63%) furthered Goal 2 – erosion reduction
- Only 15% furthered Goal 3 – upland vegetation management
- 10% of project funding for research, which did not but may eventually contribute to goals of the MSA
- 26% (one project) did not clearly further any of the MSA goals

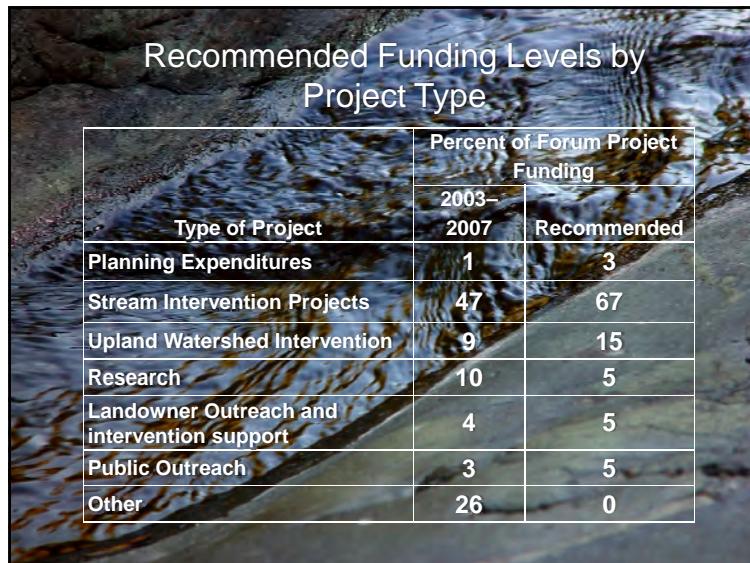


Documentation of Project Implementation and Success

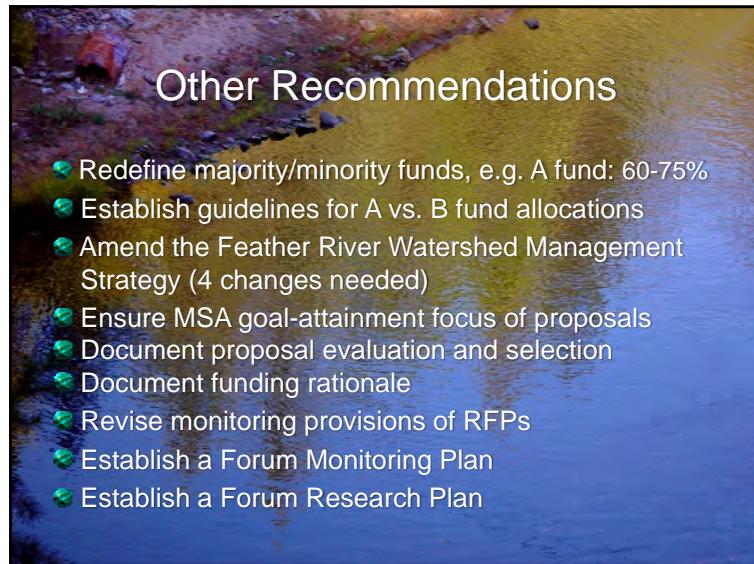
- Six projects (18% of total project funding) are not yet implemented
- Final project reports containing required information were located for only 11% of project funding (5 of 29 projects)
- For another 11% (6 projects), implementation of all project elements is not documented
- Project success cannot yet be gauged for 53% of projects; files document success for only 13%



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**Consultant's
Recommendations
Part 1**



Type of Project	Percent of Forum Project Funding	
	2003-2007	Recommended
Planning Expenditures	1	3
Stream Intervention Projects	47	67
Upland Watershed Intervention	9	15
Research	10	5
Landowner Outreach and intervention support	4	5
Public Outreach	3	5
Other	26	0



Other Recommendations

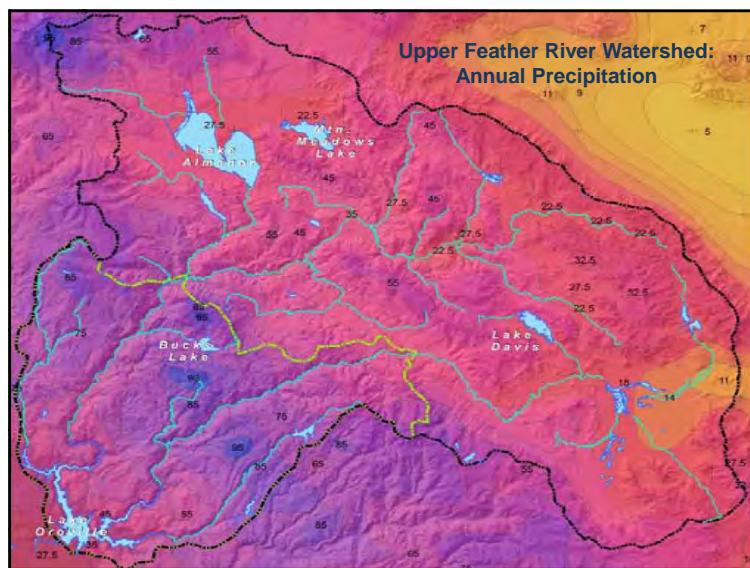
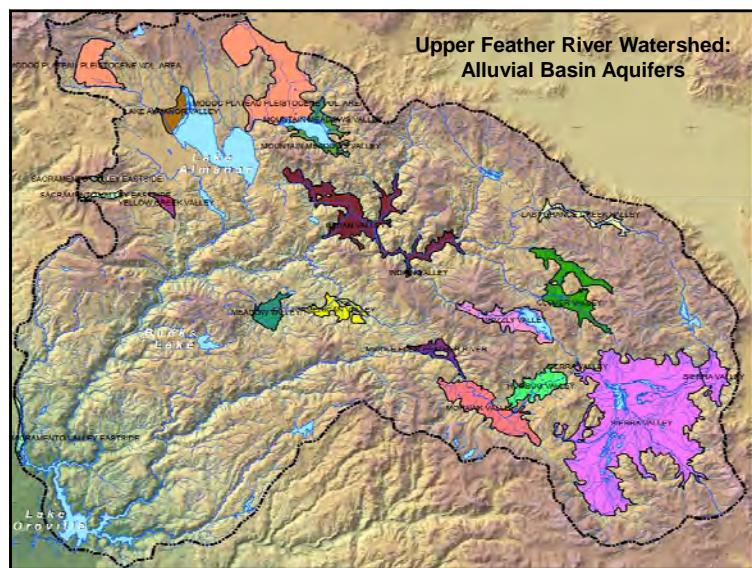
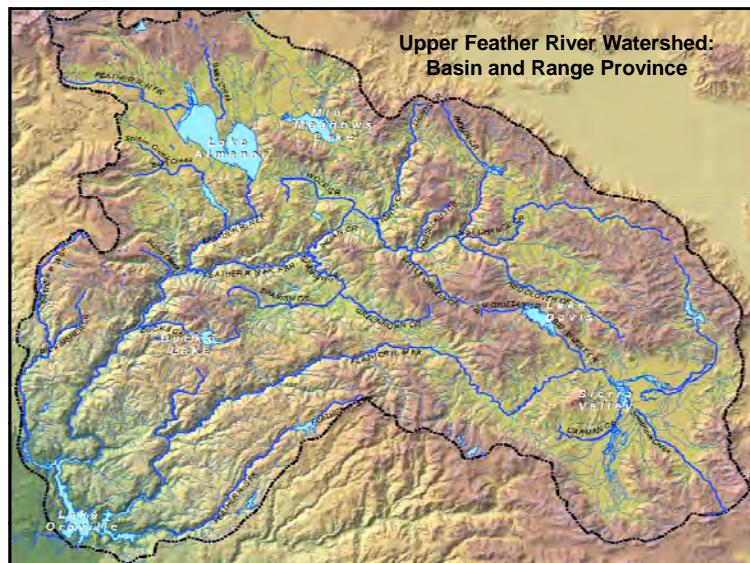
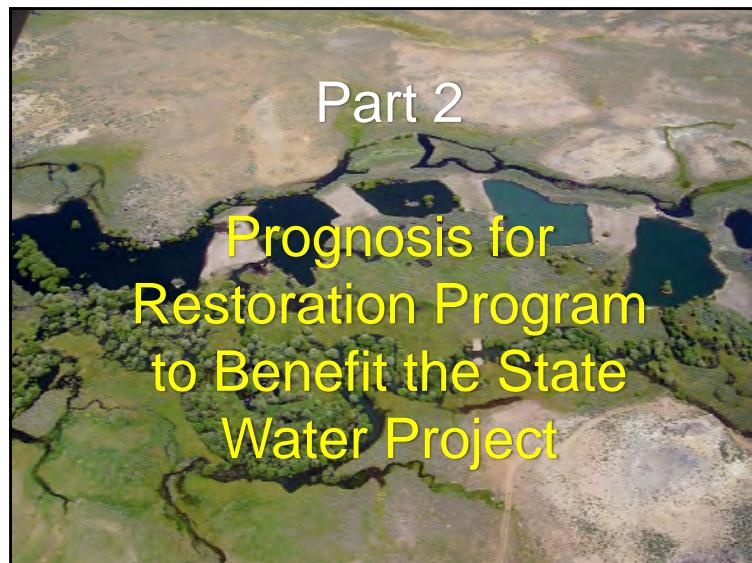
- Redefine majority/minority funds, e.g. A fund: 60-75%
- Establish guidelines for A vs. B fund allocations
- Amend the Feather River Watershed Management Strategy (4 changes needed)
- Ensure MSA goal-attainment focus of proposals
- Document proposal evaluation and selection
- Document funding rationale
- Revise monitoring provisions of RFPs
- Establish a Forum Monitoring Plan
- Establish a Forum Research Plan

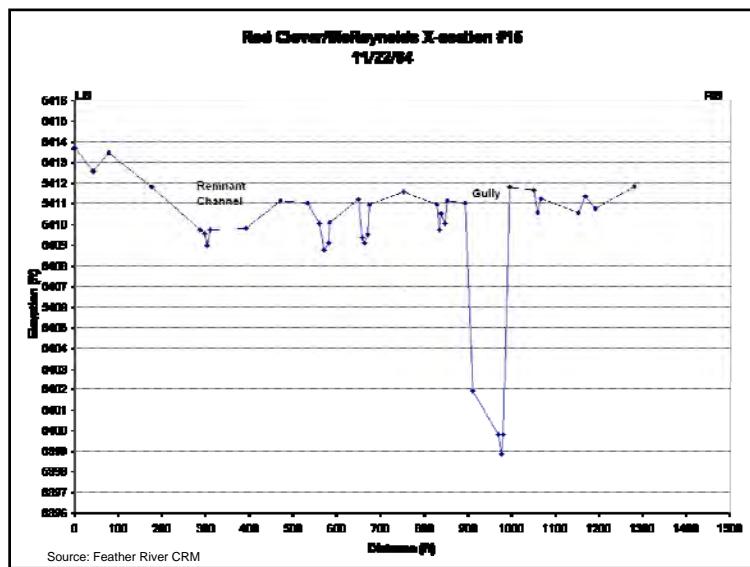
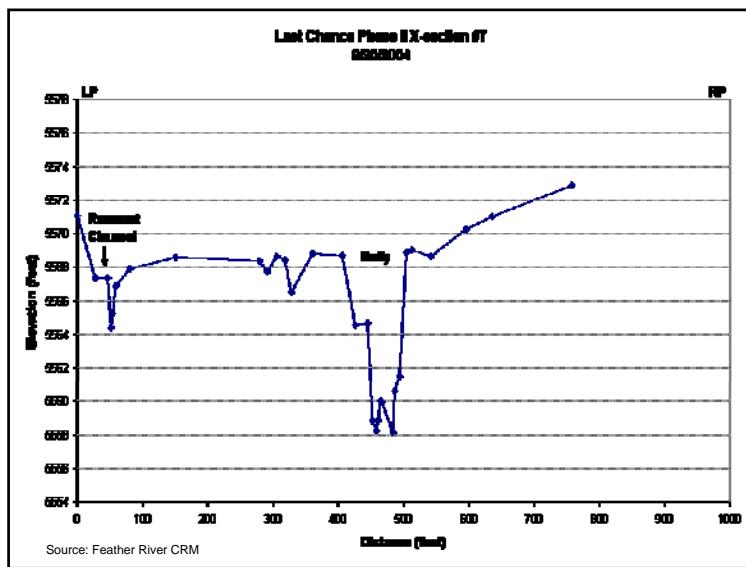
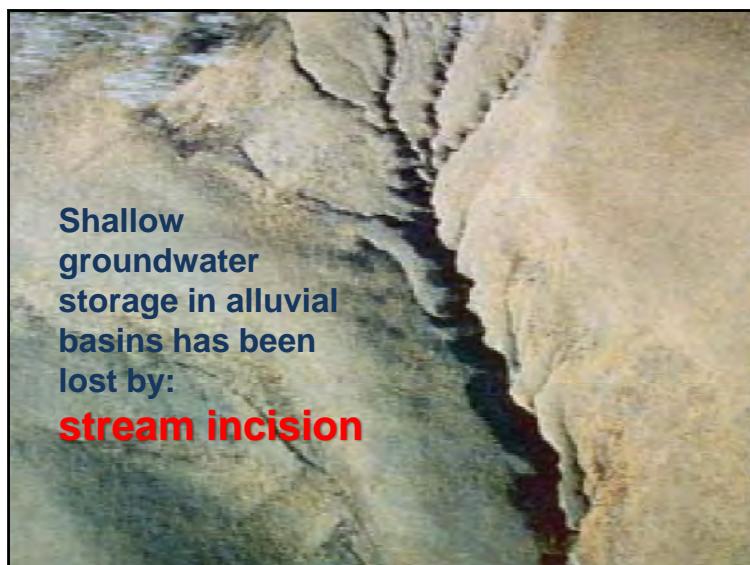


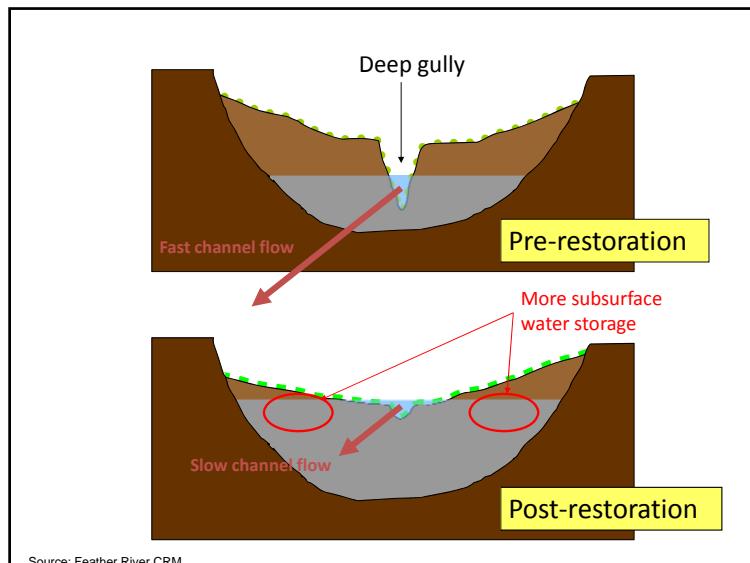
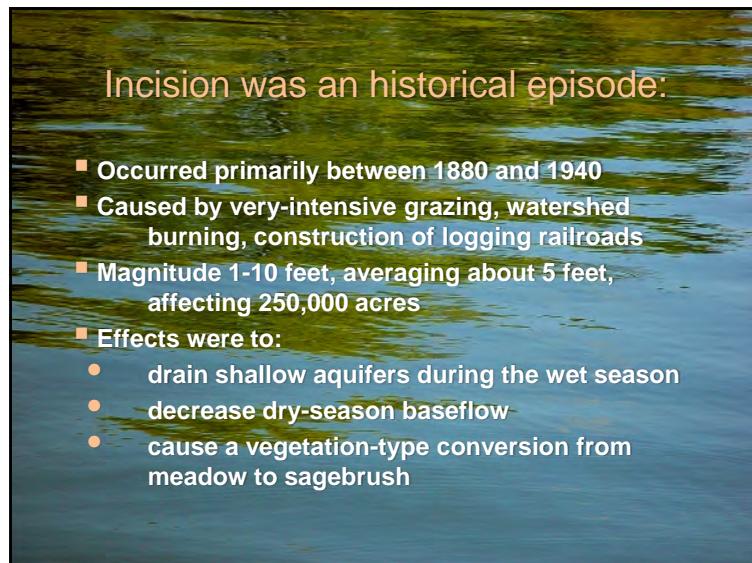
Other Recommendations

Continued

- Reassess local organizational capacity when new funding available
- Focus annual project reports on MSA-goal advancement
- Improve project implementation tracking
- Improve project success tracking
- Establish reimbursement reservation
- Separate files for successive grants
- Separate projects
- Verify post-project land management plans
- Define leveraging more inclusively
- Allow project-development projects

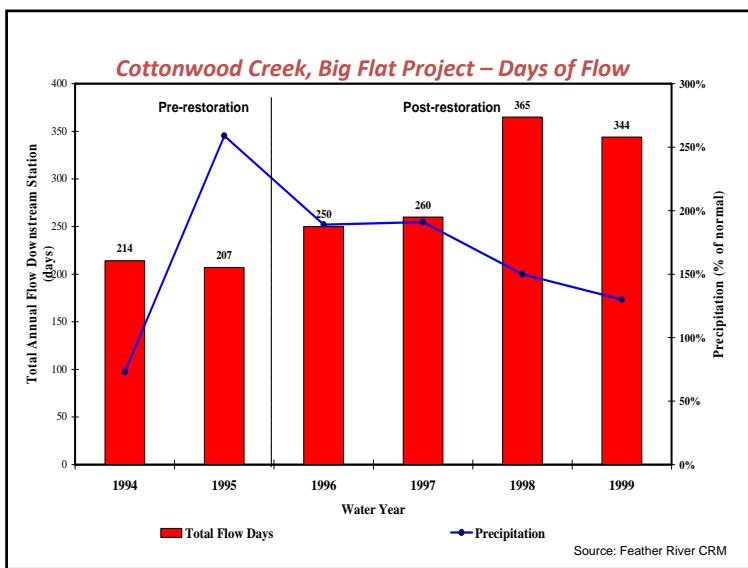
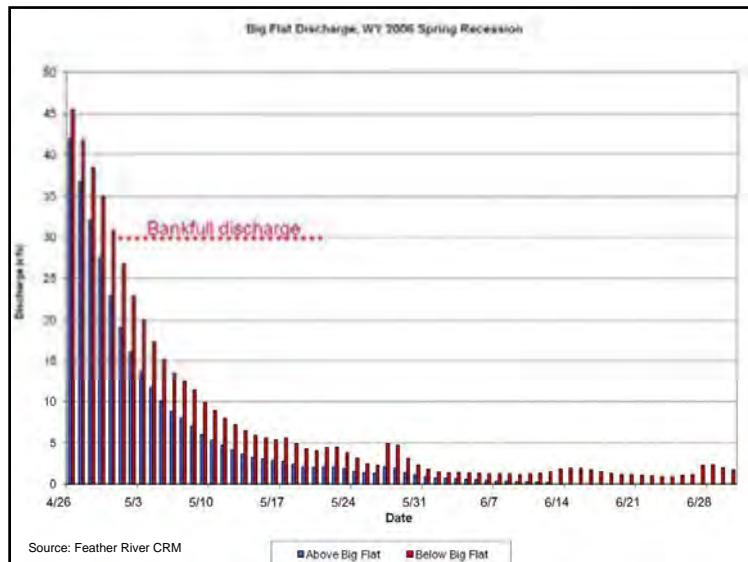


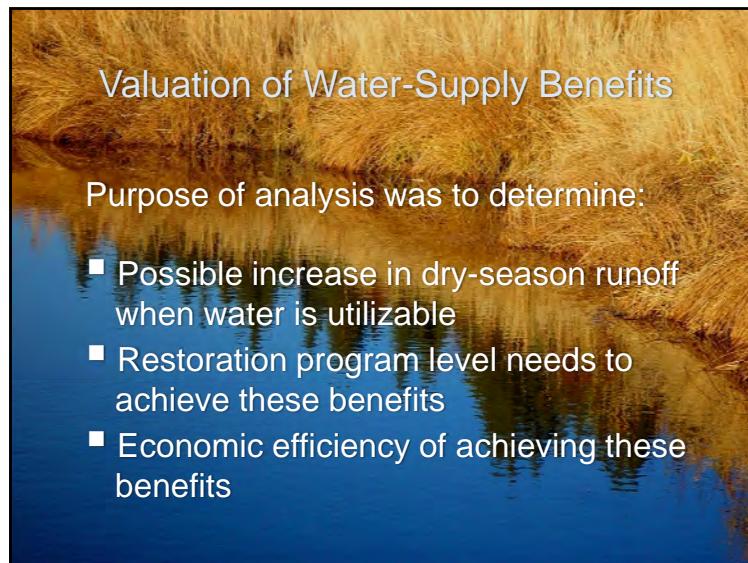








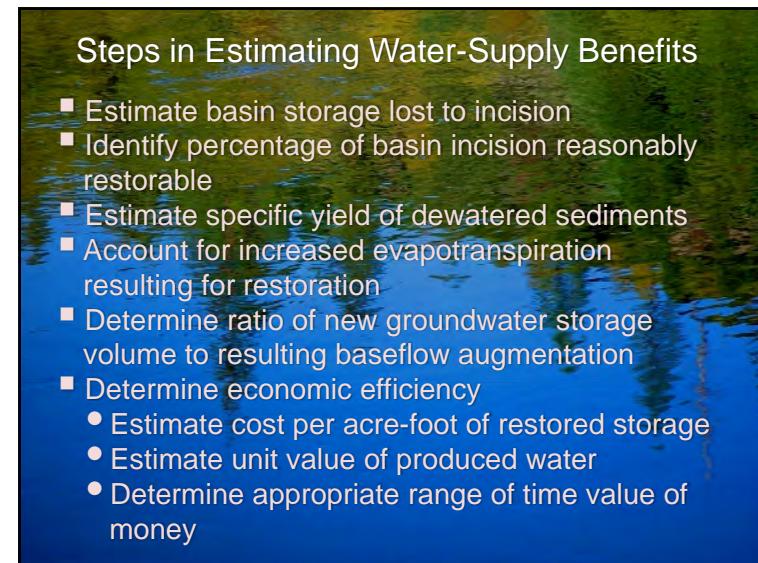




Valuation of Water-Supply Benefits

Purpose of analysis was to determine:

- Possible increase in dry-season runoff when water is utilizable
- Restoration program level needs to achieve these benefits
- Economic efficiency of achieving these benefits



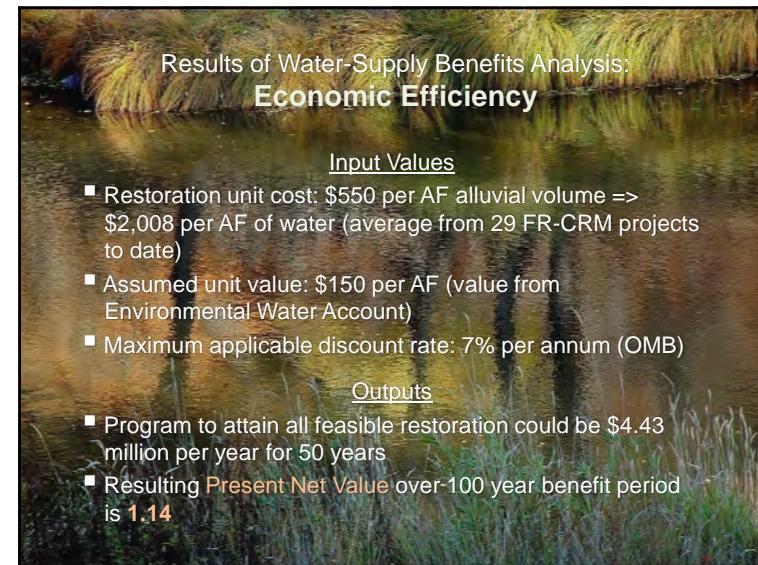
Steps in Estimating Water-Supply Benefits

- Estimate basin storage lost to incision
- Identify percentage of basin incision reasonably restorable
- Estimate specific yield of dewatered sediments
- Account for increased evapotranspiration resulting for restoration
- Determine ratio of new groundwater storage volume to resulting baseflow augmentation
- Determine economic efficiency
 - Estimate cost per acre-foot of restored storage
 - Estimate unit value of produced water
 - Determine appropriate range of time value of money



**Results of Water-Supply Benefits Analysis:
Achievable Benefit**

- Alluvial basins in the upper Feather River watershed comprise 253,000 acres
- Average maximum sustained incision depth for these basins is 4.7 feet
- Dewatered alluvial volume is 576 TAF
- For average specific yield of 33%, volume of lost groundwater storage is 190 TAF
- Maximum of 70% of incised basins is feasibly restorable
- 17% of each new foot of storage will be lost to evapotranspiration
- Ratio of baseflow augmentation to new storage capacity is 1.0
- **Therefore**, net attainable baseflow enhancement is **110 TAF** annually



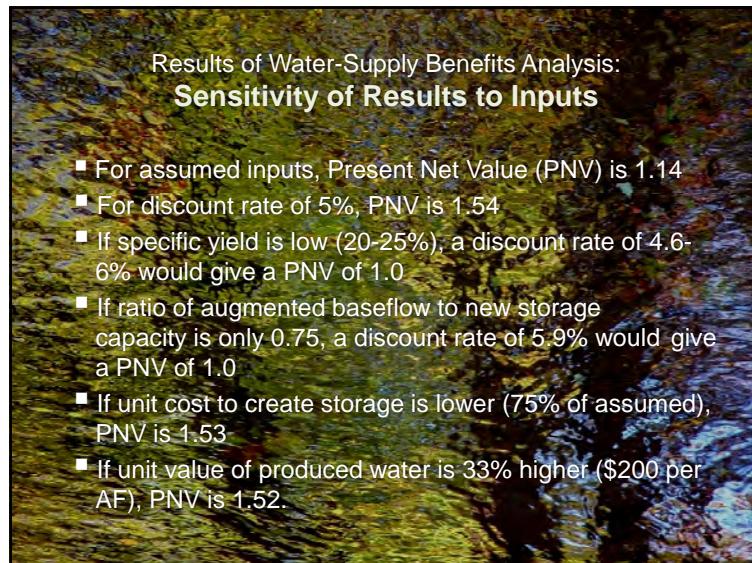
**Results of Water-Supply Benefits Analysis:
Economic Efficiency**

Input Values

- Restoration unit cost: \$550 per AF alluvial volume => \$2,008 per AF of water (average from 29 FR-CRM projects to date)
- Assumed unit value: \$150 per AF (value from Environmental Water Account)
- Maximum applicable discount rate: 7% per annum (OMB)

Outputs

- Program to attain all feasible restoration could be \$4.43 million per year for 50 years
- Resulting **Present Net Value** over 100 year benefit period is **1.14**



**Results of Water-Supply Benefits Analysis:
Sensitivity of Results to Inputs**

- For assumed inputs, Present Net Value (PNV) is 1.14
- For discount rate of 5%, PNV is 1.54
- If specific yield is low (20-25%), a discount rate of 4.6-6% would give a PNV of 1.0
- If ratio of augmented baseflow to new storage capacity is only 0.75, a discount rate of 5.9% would give a PNV of 1.0
- If unit cost to create storage is lower (75% of assumed), PNV is 1.53
- If unit value of produced water is 33% higher (\$200 per AF), PNV is 1.52.



Watershed Restoration Program Summary and Conclusions

- The meadow restoration program may produce 110 TAF of utilizable new water volume per year
- Producing this water appears to be economic efficient, based on water-supply benefits alone
- Upland vegetation management program (MSA Goal 3) may produce an additional 17-26 TAF per year
- Both the meadow and upland restoration programs result in reduced sediment yield, providing additional water-supply, power-generation, and ecosystem benefits
- Other benefits accrue to flood control, riparian habitats, and food production
- If all benefits were included in an expanded benefit-cost analysis, the watershed restoration program would be seen to be an economically efficient public works project for California



**Consultant's
Recommendations
Part 2**



Recommendations

- Recognize cost effectiveness
- Increase stream-alluvial basin intervention funding
- Establish long-term restoration funding
- Assume mitigation credits and benefits
- Empower leadership by Feather River CRM
- Develop research and monitoring plans
- Increase school program funding
- Maintain landowner outreach capacity
- Continue advancing upland vegetation management goal
- Examine water rights implications
- Improve project results/success tracking

