

The Sierra Nevada Watershed Ecosystem Enhancement Project: Measuring the potential of forest thinning to enhance ecosystem services

For more information about SWEEP, please visit our website: <http://ucanr.edu/sweep/>

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What is SWEEP?

The **Sierra Nevada Watershed Ecosystem Enhancement Project (SWEEP)** is in its second phase, a four year project, with the goal of quantifying the physical and financial relationships between Sierra mixed conifer forests in terms of fire resiliency, carbon storage in trees, and water in streams. Much of the Sierra Nevada is covered with forests that are dramatically denser than before fire suppression policies led to extinguishing most wildfires. Today's denser forests are more prone to experiencing high severity fire in which most trees are killed and forest litter is consumed. This can lead to soil erosion, reduced ability of forests to absorb precipitation, and increased risk of flooding. These forests also use large amounts of water that could have gone to streams, rivers, canals and the delta. Projected declines in Millerton Reservoir inflow (right) in the 2013 Bay Delta Conservation Plan illustrate the interest in enhancing stream flows.

SWEEP's goal is to design and implement field level projects to quantify the interactions of forest biomass growth, fire risk, and water yield. Field measurements of leaf area, biomass, soil moisture, snowpack and evapotranspiration will be combined with intensive water measurements to better understand the key tradeoffs. In collaboration with beneficiaries and stakeholders, we will then estimate the values that different beneficiaries place on increases in fire resiliency, carbon storage, and water yield.



Thinned forested hillslope

Climate change based projections of reservoir inflows increase statewide interest in total watershed management

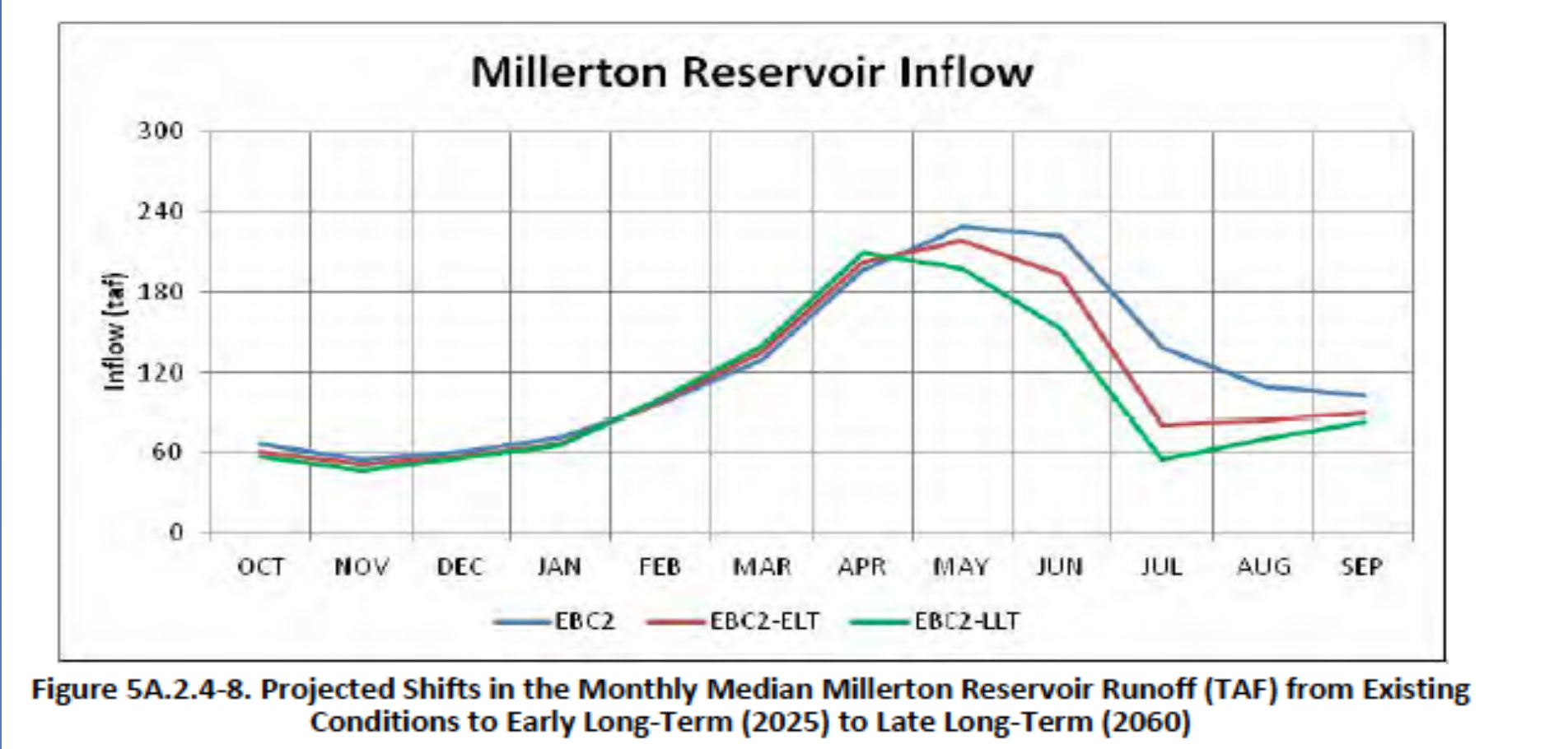
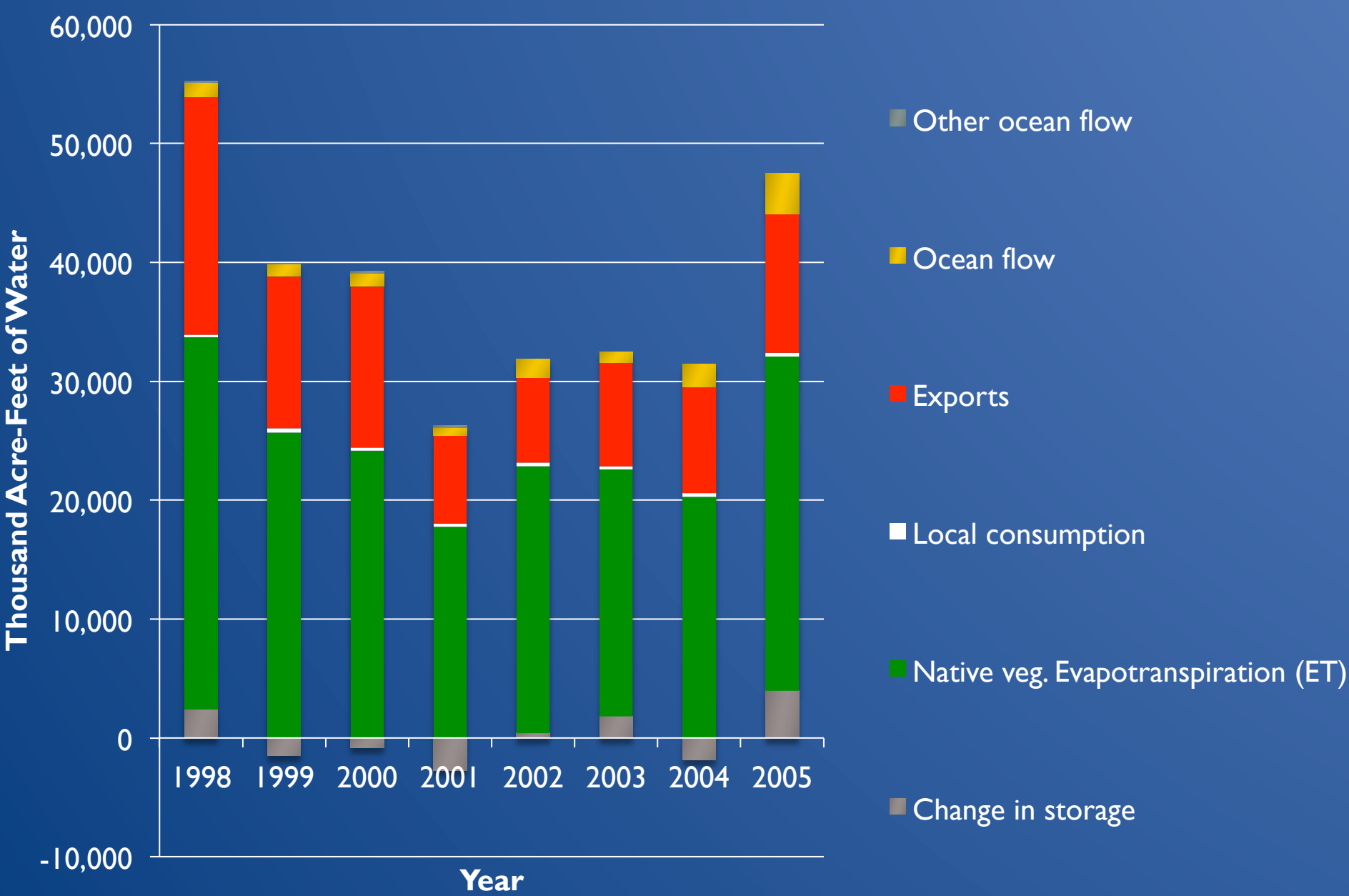


Figure 5A.2.4-8. Projected Shifts in the Monthly Median Millerton Reservoir Runoff (TAF) from Existing Conditions to Early Long-Term (2025) to Late Long-Term (2060)

Bay Delta Conservation Plan. March 2013.

Forest land ownership above powerhouses, rivers, and canals influence who will invest in and who will benefit from total ecosystem enhancement projects

Forests dominate the water balance of the Sierra Nevada

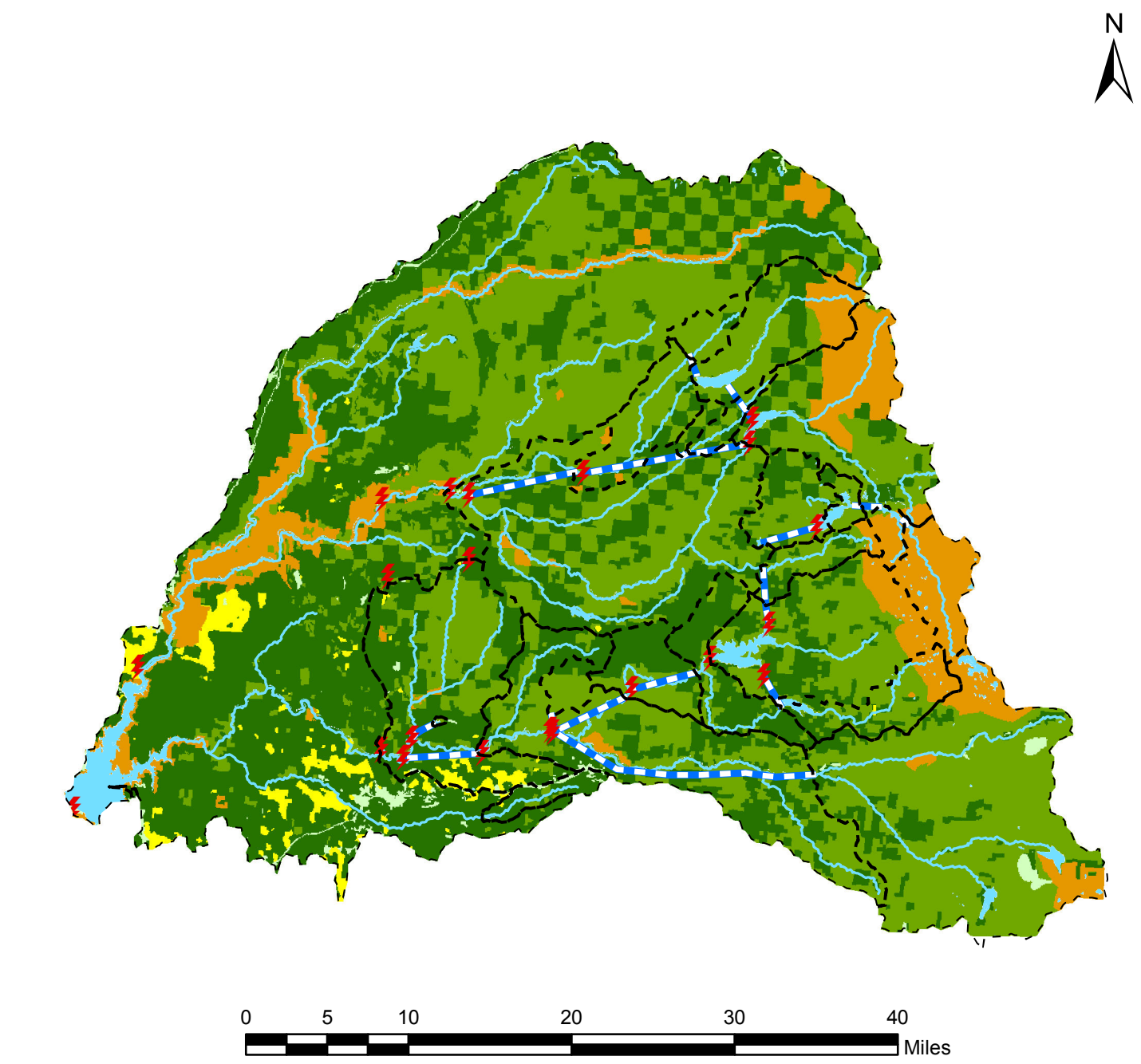


2009 California Water Plan. DWR



Meteorological station at Duncan's Peak

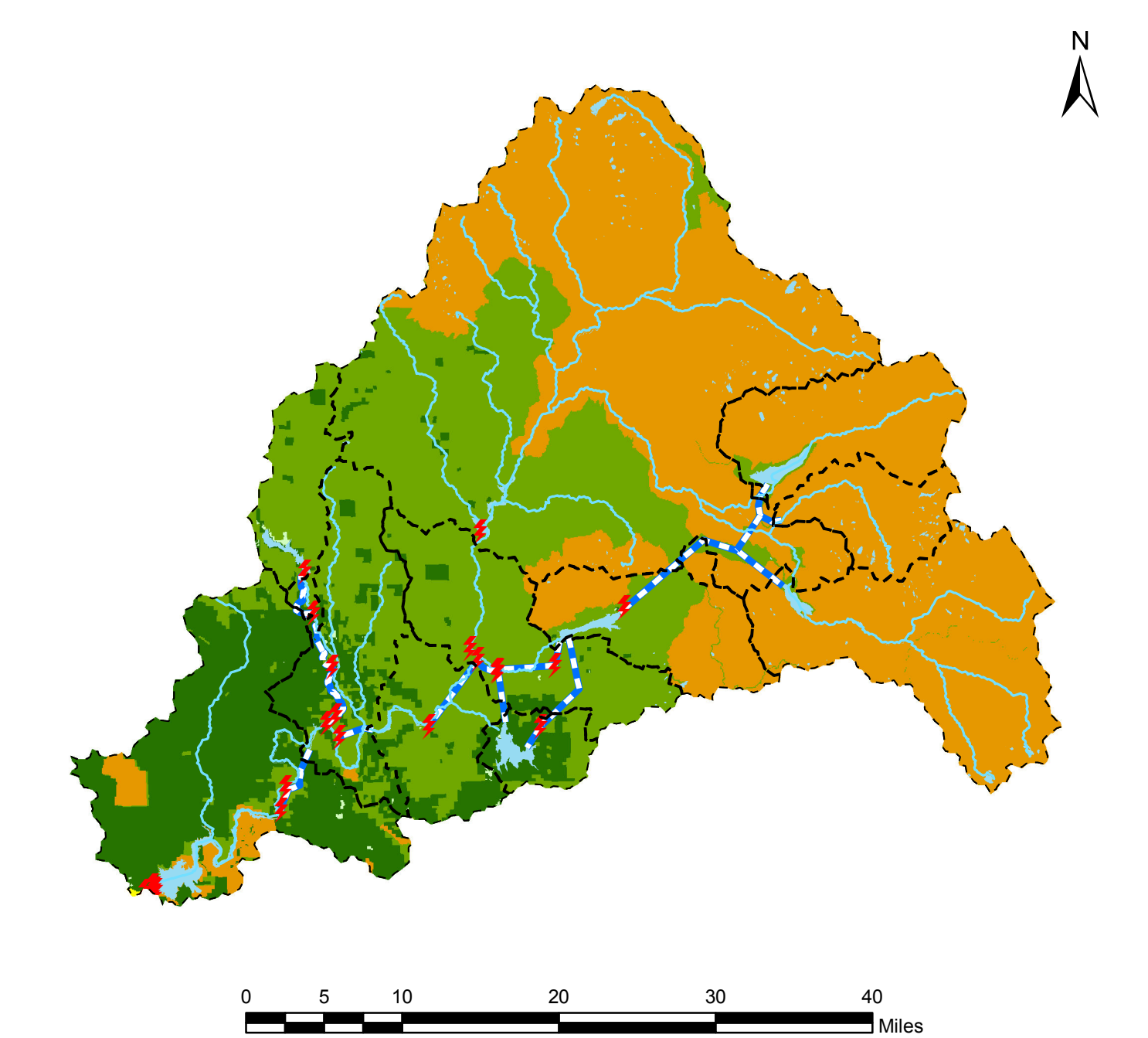
Powerhouses and Watersheds in American River System



Legend	Land Management Status	Area in different watershed areas (acres)		
		Upper	Middle	Lower
Watershed Boundary	Agriculture	2,580	1,147	672
Hydro Power Plant	Urban Areas	82	178	3,190
Stream, river, creek	Reserve	68,828	4,297	630
Aqueduct, tunnel	Private	50,433	120,755	34,756
Lake, pond, bay	Public	174,838	160,535	27,449

Data Source: Various; Credits: Various; Date: 04/01/2013

Powerhouses and Watersheds in San Joaquin River System



Legend	Land Management Status	Area in different watershed areas (acres)		
		Upper	Middle	Lower
Watershed Boundary	Agriculture	-	529	31
Hydro Power Plant	Urban Areas	-	-	-
Stream, river, creek	Reserve	472,746	30,968	398
Aqueduct, tunnel	Private	2,352	17,105	35,156
Lake, pond, bay	Public	159,168	123,728	77,689

Data Source: Various; Credits: Various; Date: 04/01/2013