

River temperatures over 56 degrees kills salmon eggs.  
95 to 98 percent of salmon runs were lost in 2014 and 2015.









Biop not strong enough, NMFS is moving to strengthen cold water requirements but facing stiff opposition.



**NOAA**  
**FISHERIES**

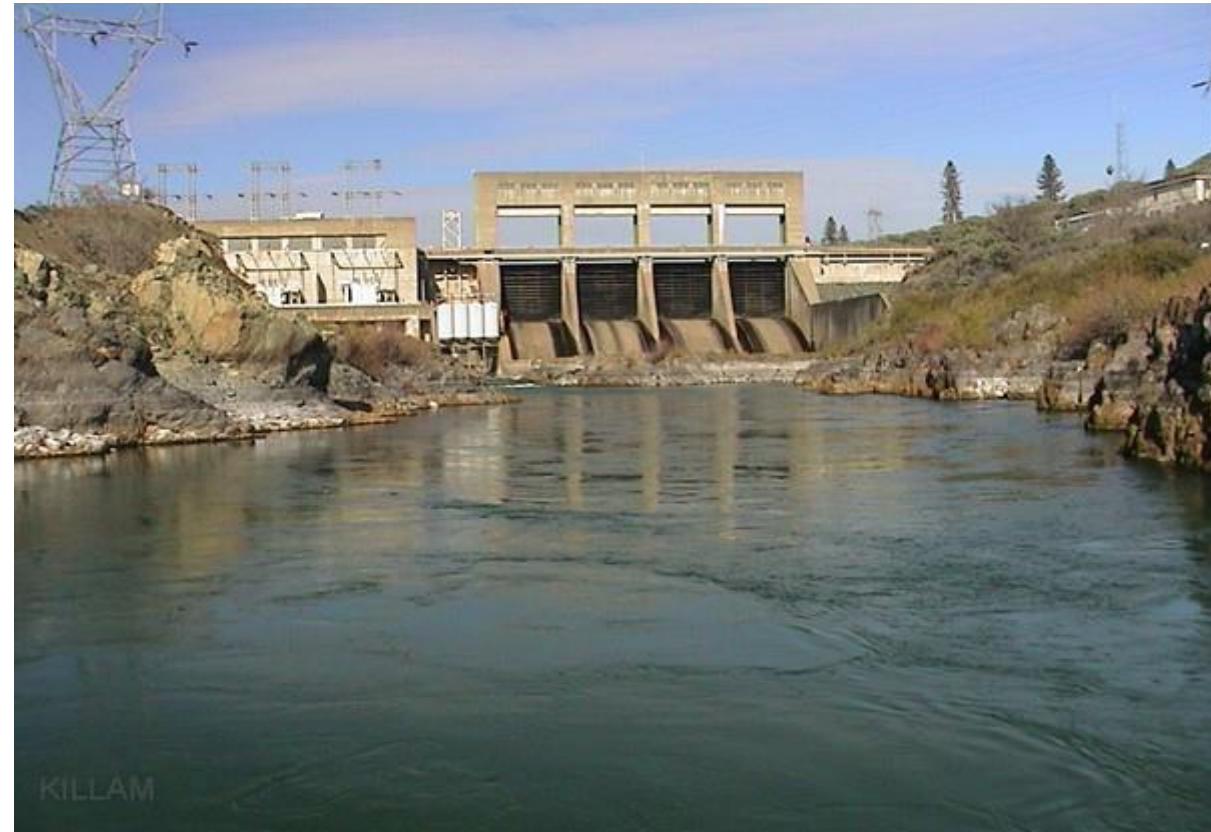


Biop protects winter and spring run but leaves fall run unprotected





Example: going from this to this in the fall leaves...



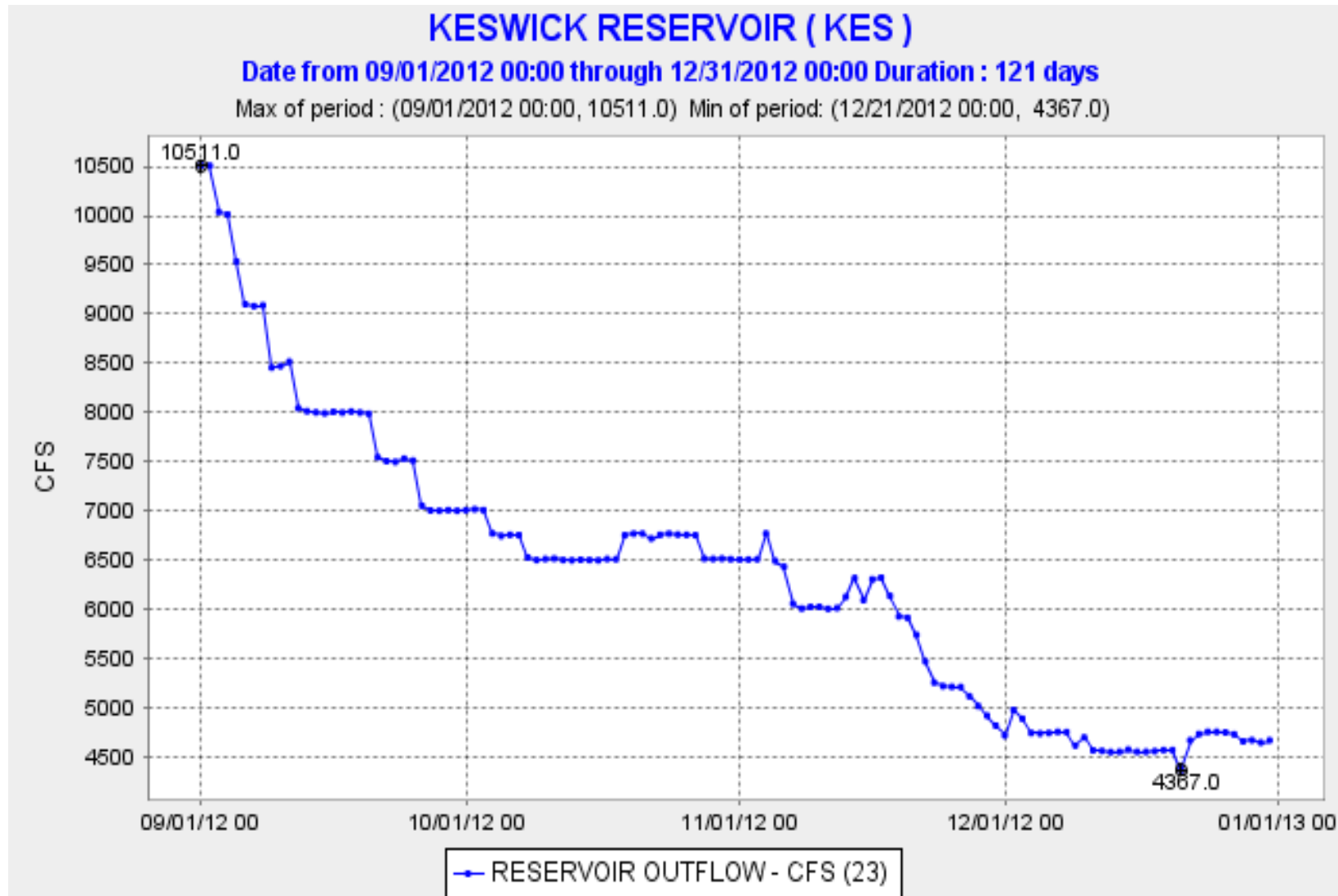


...this. State Water Board action needed?





September through December 2012 (blue line should be straight from left to right to protect fall run salmon)





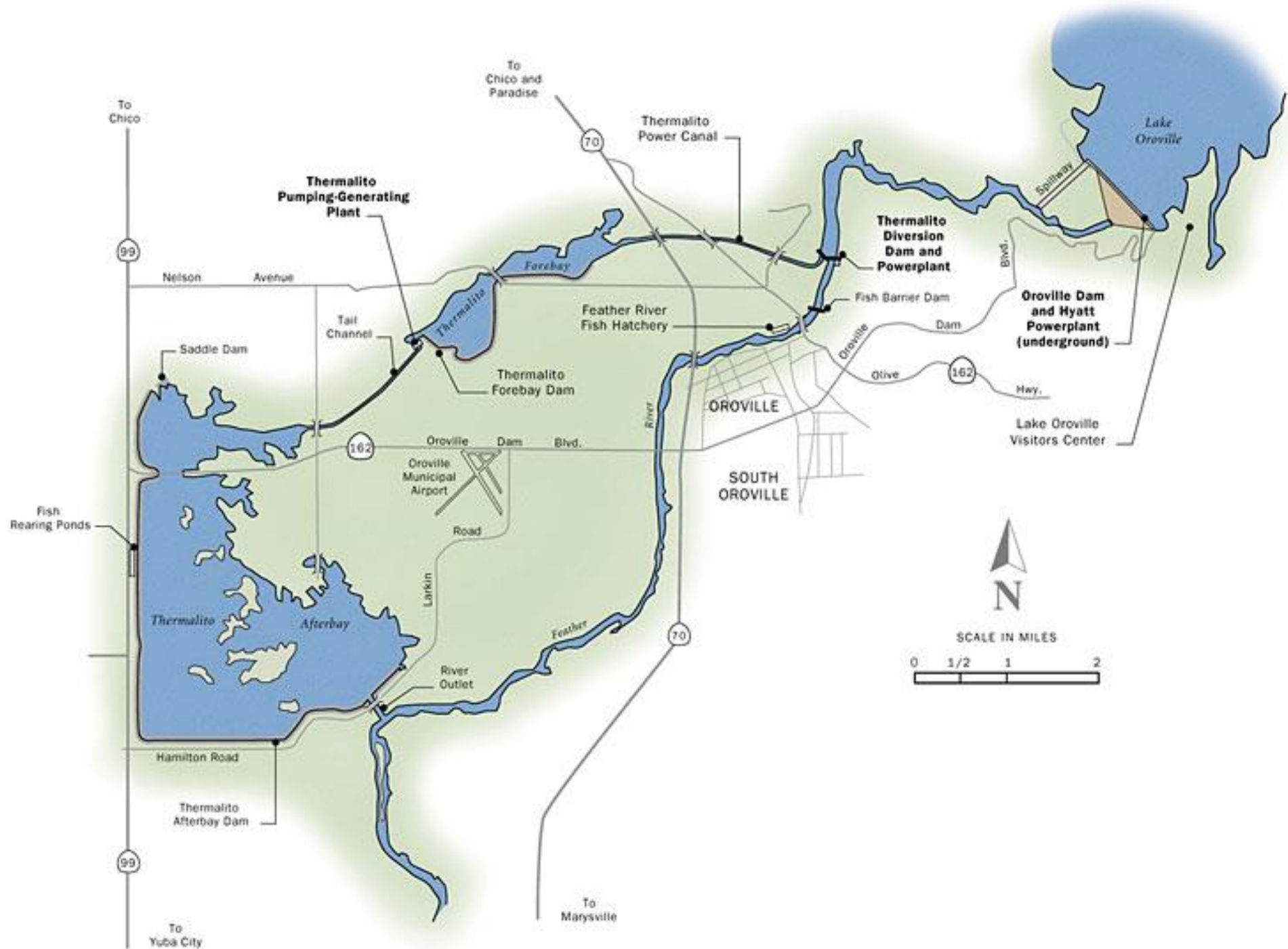
F&G code 5937 prohibits this but not generally enforced, State Water Board action needed?





Lack of water in spring = much higher predation. One solution: State Water Board mandate spring outflow in dry years















Some say the real problem is predation



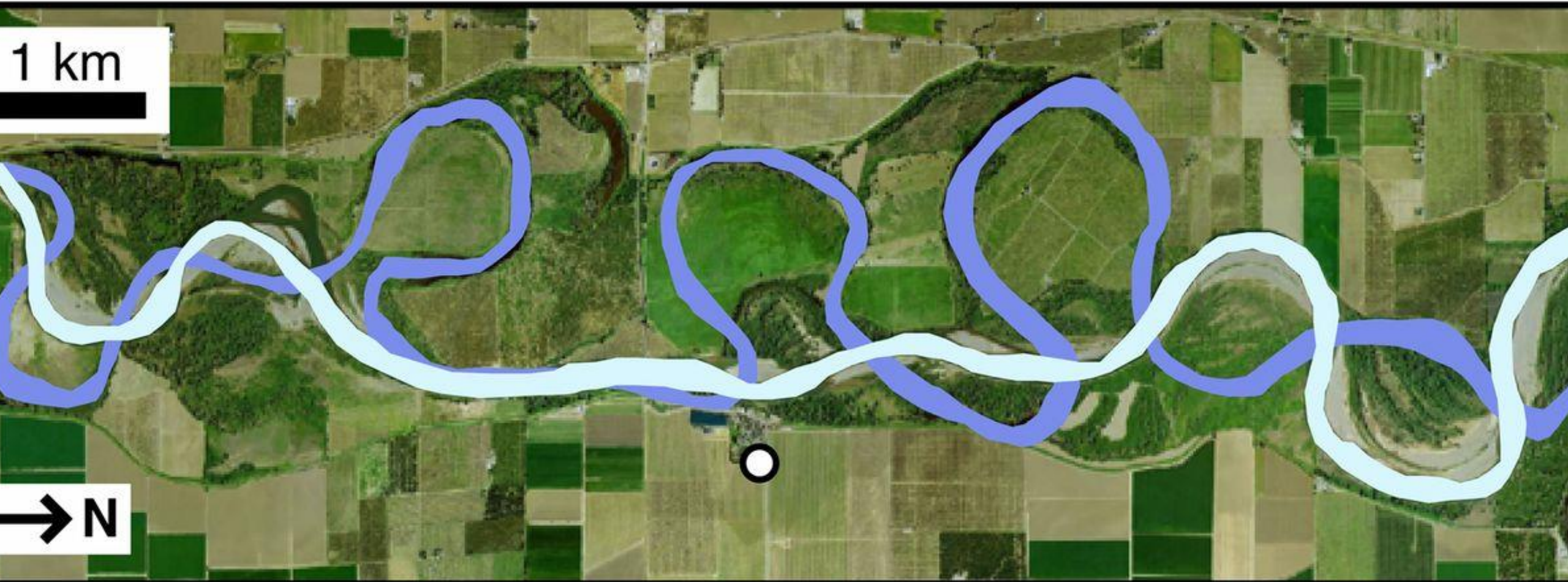


Predation is highly amplified by destruction of natural bank habitat





Oxbows have been replaced by straightened river channels





Manmade structures provide habitat for predatory fish.



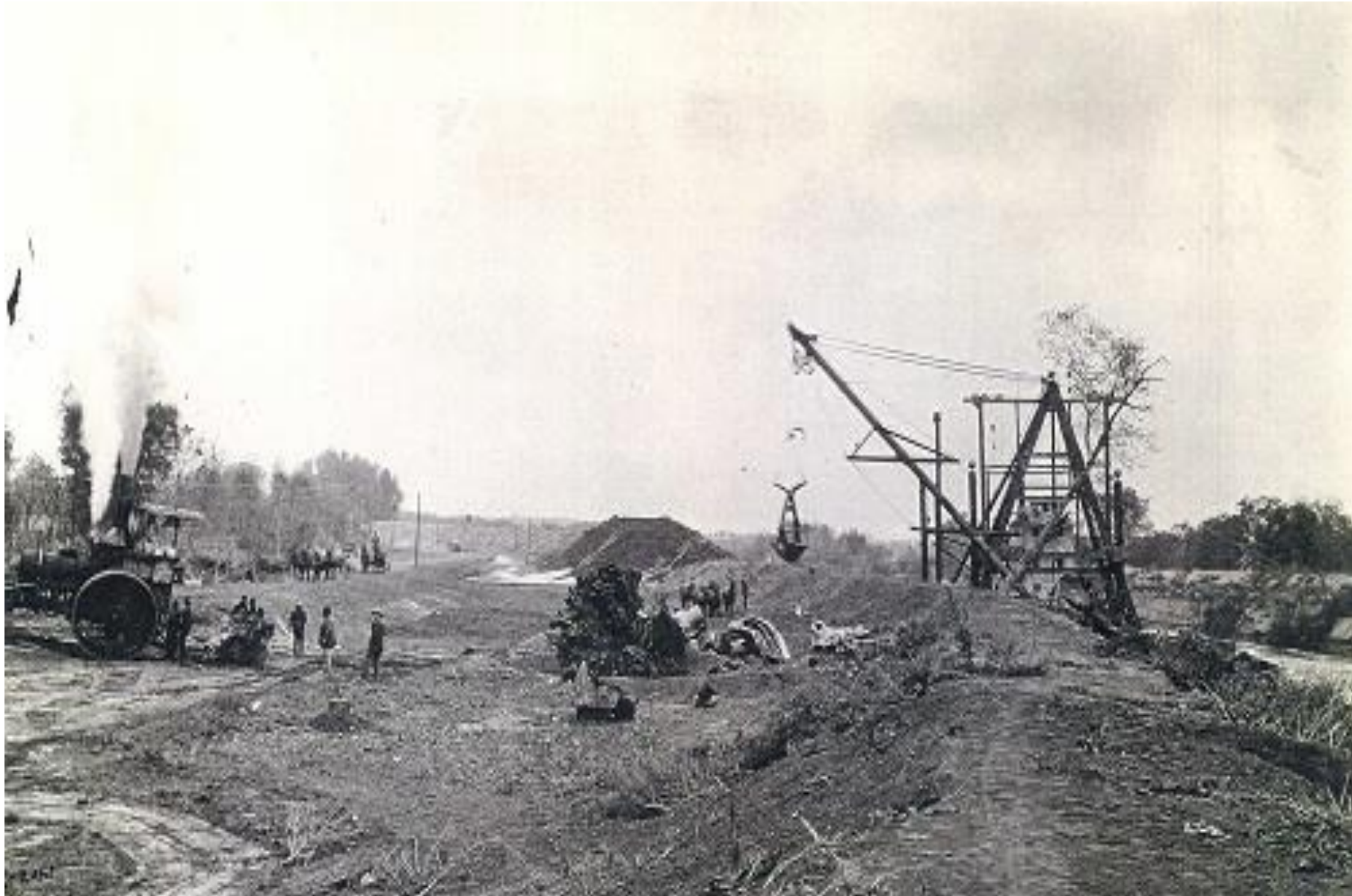


Shallow water salmon nurseries used to dot the Central Valley. A few still exist

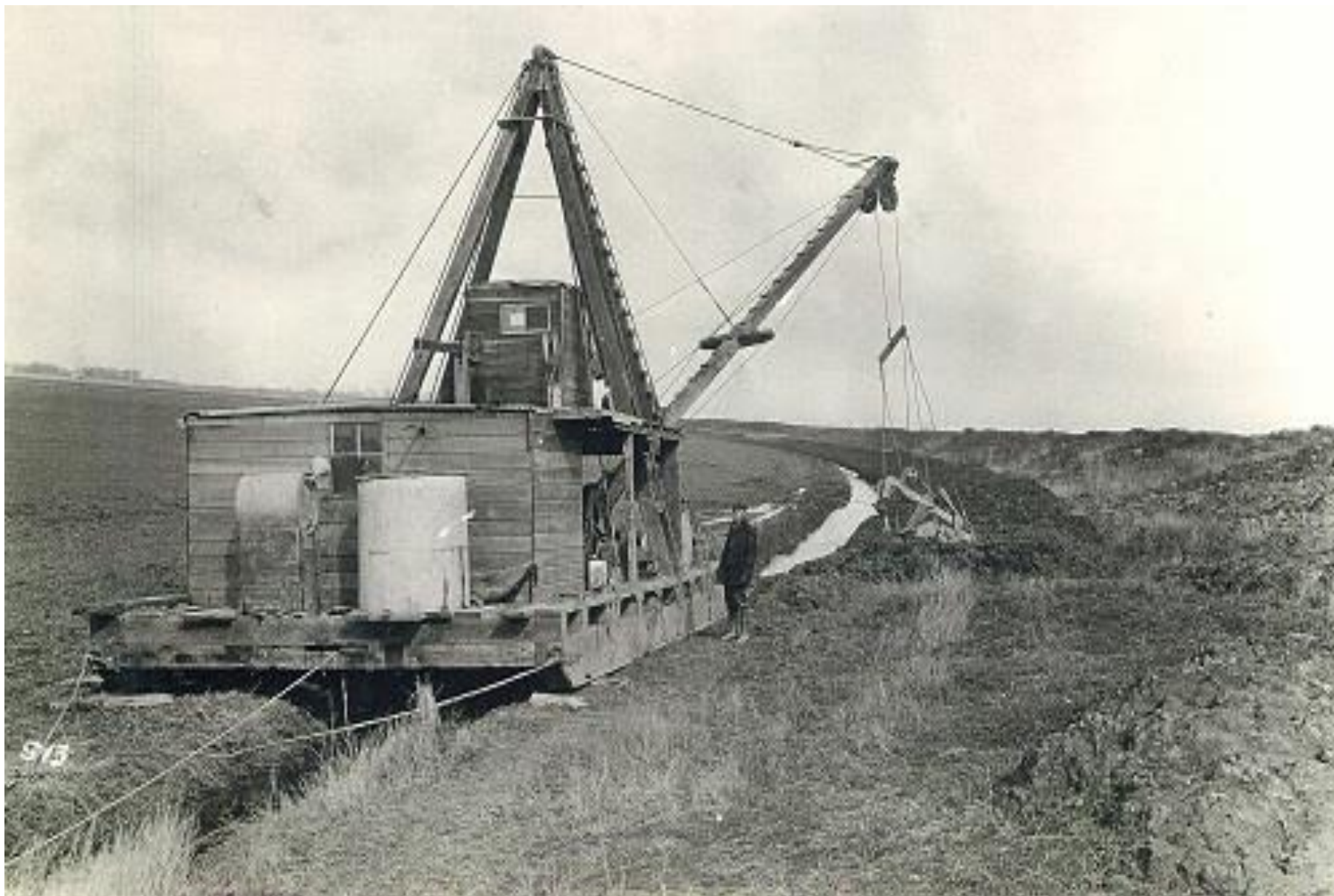




Much of the damage was done before permits existed



There was no CEQA back in the day....





Nor NEPA





Programmatic permits are needed for large scale restoration

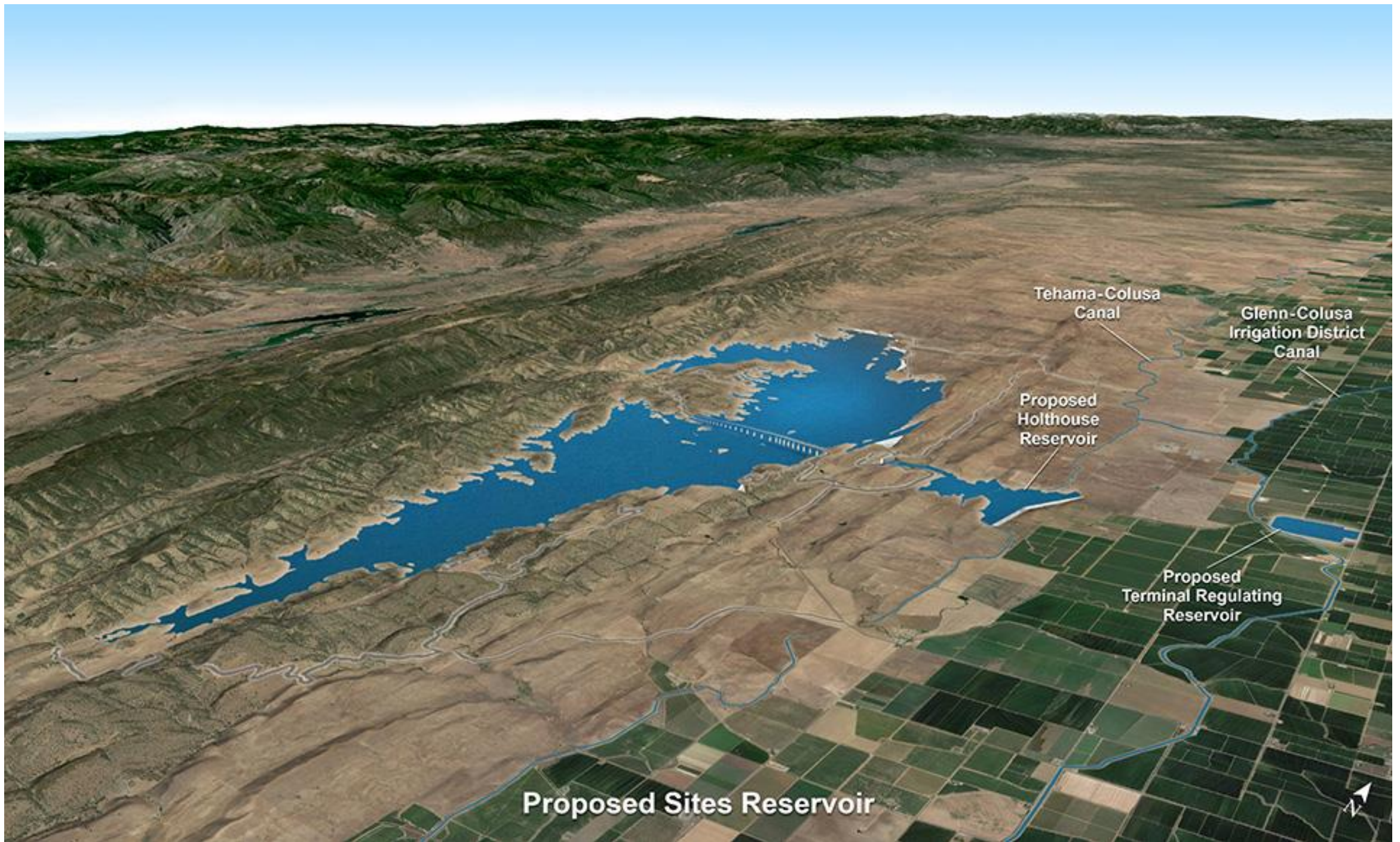




# Programmatic permit could cover floodplain restoration







**Proposed Sites Reservoir**

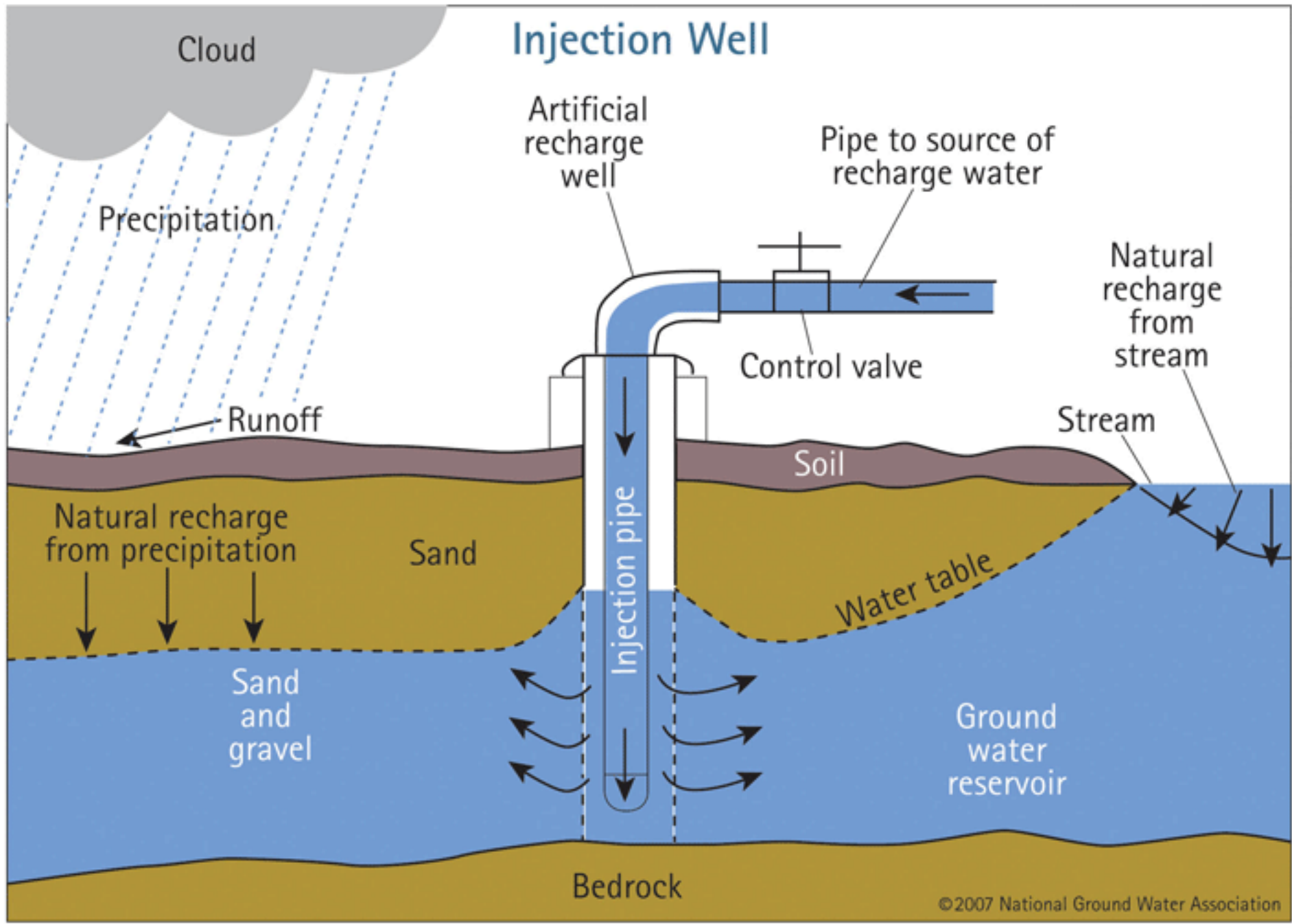
**Tehama-Colusa Canal**

**Glenn-Colusa Irrigation District Canal**

**Proposed Holthouse Reservoir**

**Proposed Terminal Regulating Reservoir**





One possible future...

