



# Fire Resiliency, Response & Stewardship



NID Board of Directors Meeting  
July 24, 2019



# Increased Wildfire Threats in California

California characterized as one of the most “climate-challenged” regions of North America that will require swift, collaborative efforts to become more climate-resilient. (California’s Changing Climate, 2018).

129 million dead trees on 8.9 million acres, 85% in the Sierra Nevada. Wildfire now occurring year-round, **Nevada County is a high risk community**. (USFS and CAL FIRE, 2017).

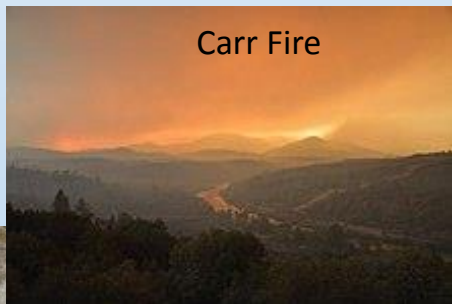
Sierra Nevada is headwaters for California providing **60% of the water** supply for the state. (SNC).



Rim Fire



King Fire



Carr Fire



Tubbs Fire

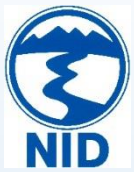


Mendo Complex

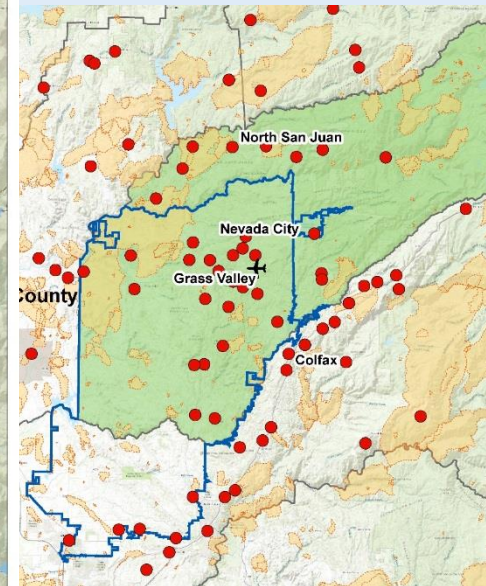
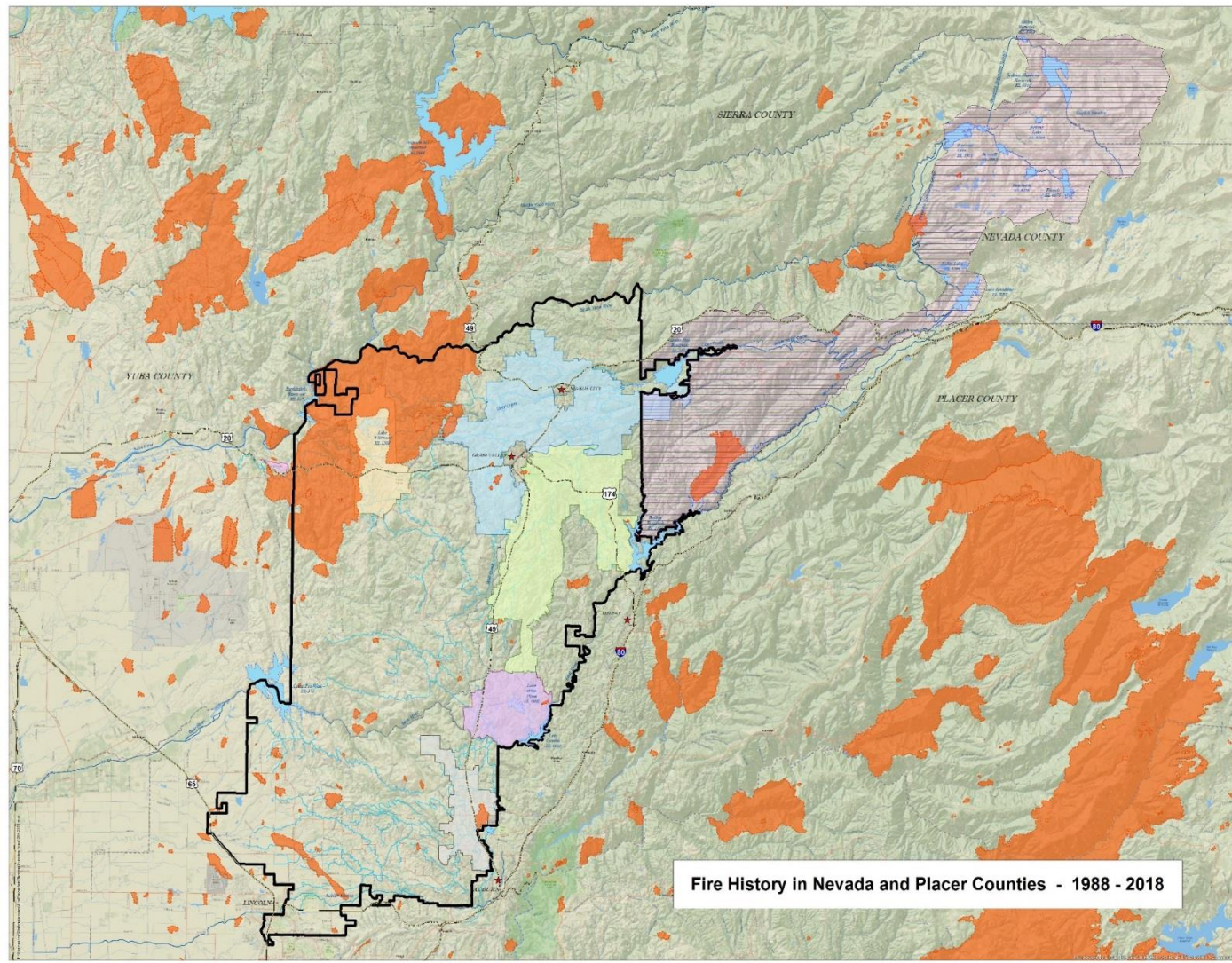


Camp Fire

Aug. 2013                      Sept. 2014                      July 2018                      Oct. 2018                      Nov. 2018



# Increased Wildfire Threats to NID



“Communities at Risk”  
CAL FIRE

Fire History, District SOI, Area of Influence & WTP Service Territory



# NID's Fire Resiliency & Stewardship Activities

- Promote cooperation and coordination locally & regionally
- Protect headwaters water supply / maintain healthy forests
- Community education & awareness at the source
- Establish power line clearing & fuel removal at power sources
- Integrate maintenance programs for resiliency
- Invest in community water extensions & hydrants
- Recognize & promote water flows during critical events



Rim Fire, 2013.



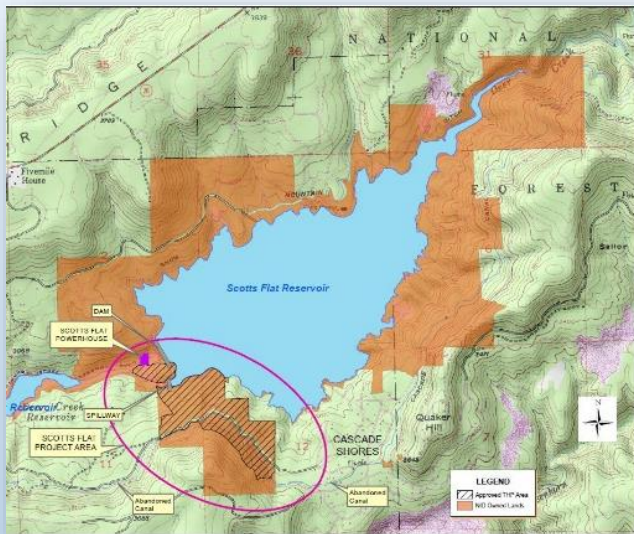
# Administrative: Regional Cooperation & Coordination

- Nevada / Placer County Partners
  - Critical Infrastructure Database Sharing
  - Local Hazard Mitigation Planning
  - NV Co. Wildfire Prevention Stakeholder Meetings
  - Local Fire Districts
- Mutual Aid Agreements
  - Paradise Irrigation District
- Regional / State / Federal Partners
  - USFS Good Neighbor / Master Stewardship Agreements
  - State Granting Agencies – DWR / SNC / CALFIRE /
  - Fire Safe Councils
- Internal
  - FEMA Incident Command Center Training
  - Incident & Injury Procedures / Protocols

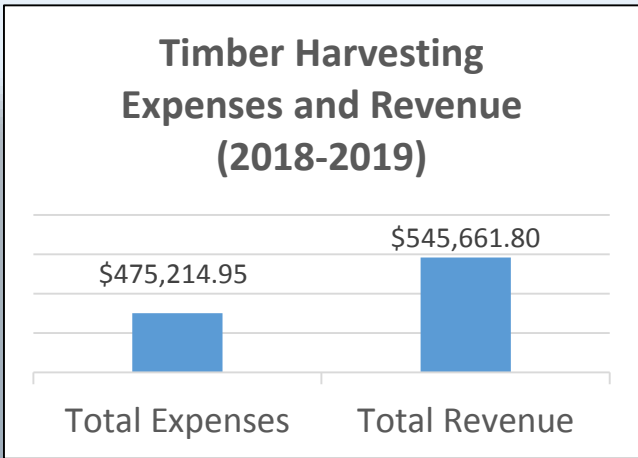




# Watershed: Selective Logging at Scotts Flat Reservoir



Scotts Flat Phase 3 understory thinning in partnership with SNC (2016).



## Scotts Flat Timber Harvest Plan Implementation:

- Forest thinning is necessary create healthy forests with appropriate stand density, reduced hazard tree and wildfire risk
- THANK YOU SNC - \$1.23M YTD in Grant Funding



Gate 1 and Gate 2 hazard tree removal.

*Timber harvesting around Scotts Flat generated \$70,446.85 in revenue 2018-2019.*

*Revenue used to treat hazard trees at campgrounds.*

**Volume of timber removed 2018-2019: 1013.13 MBF (over 1 million board feet removed, and best and healthiest remain)**



# Watershed CAL FIRE CFIP Grant: Fuels Treatment at Peninsula Campground

- CAL FIRE's California Forest Improvement Program (CFIP)- District expense offset 30-60% by State funding for fire fuels and understory thinning
- ~81 acres treated with mastication to reduce risks to human health and safety, severity of wildfire, damage to District infrastructure, and storage capacity of Rollins Reservoir
- Pre and post-treatment plots indicate wildfire risk has been shifted from a crown or full consumption fire to ground fire when Forest Vegetation Simulator (FVS) model run for average late summer conditions.



**Pre-treatment plots 2700 trees/acre**



**Post-treatment plots 140 trees/acre**



# Watershed: Vegetation Management on District Properties

- Grazing leases held on 4 District properties to manage vegetation and fire risk:
  - 3 in lower elevation oak-grassland communities and 1 in high elevation zone
  - Lessees pay to graze cattle and they maintain fencing around property
  - District benefits from fuels reduction and presence on remote properties
- Concerns from neighboring landowners about vegetation on District properties
  - Most do not have infrastructure, outside of standard O&M scope of our Maintenance Dept. crews
  - Watershed Division facilitating work, creating prioritized list to track treatment and long-term maintenance



Clifford Rd pre-treatment



Clifford Rd post-treatment





# Recreation: Campground Fire Awareness & Education

- Signs are posted at all campgrounds (Lower & Upper Division)
- Campfire information is located in Rules and Regulations and Website
- Back of our Campground Maps and given to all campers as they enter the campgrounds
- Sent out with all reservation confirmations



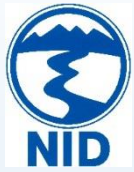
**Campfires:** Campfires ONLY permitted in established BBQ pits and campground fire rings. Do NOT leave fires or coals unattended. Fires must be extinguished before leaving Campsite or retiring for the evening. NO open ground fires permitted on the shorelines. **\*Fire restrictions may be imposed due to weather conditions, at which time, campfires and charcoal fires will not be permitted.**



# Recreation: Fire Fuels Reduction & Hazardous Tree Removal

- Ongoing thinning of the forest in and around campgrounds to reduce fire fuels
- Clearing of 4-5 feet around all campfire rings
- Clearing brush and over growth around our campsites leaves no hiding places for hot coals to be disposed of – see photo to right
- Staff inspects the “whole” site, not just the fire ring, after campers leave.
- Water System Upgrades / New Hydrants
- Ongoing dispersed campfire removal on USFS & NID lands in upper country





# Hydro: Transmission Line Clearing / Veg. Mgmt

- The Bowman Transmission Line is nine miles long and transmits power from the Bowman Powerhouse to the CAISO controlled grid.
- Annual program to manage & fall hazard trees and clear vegetation along transmission lines
- Program accelerated in recent years due to increased tree mortality and evolving regulations
- **2019 Activities**
  - Approximately 7,000 linear feet treated as of 6/28
  - Approximately 8,000 linear feet planned by 12/31
  - Hazard trees identified in July to be removed by 12/31
- **2020 Activities**
  - Continue routine removal of emergent vegetation and hazard trees on entire line
  - Poles 28-39 (+/- 3,400 lineal feet) identified as high priority for treatment

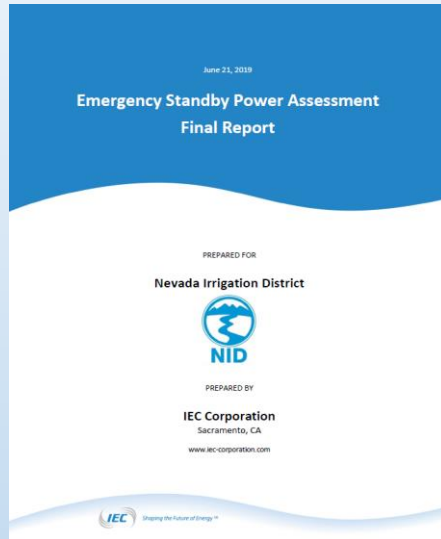


Transmission line before (above) and after (below) treatment.





# Hydro: Powerhouse Backup Power Supply



- Extended forced outages of powerhouses expected due to PG&E Public Safety Power Shutoffs (PSPS)
- Study completed to identify impacts:
  - Operational
  - Economic
  - Other
- Recommendations to maximize resiliency and reliability while minimizing cost
- Estimated annual PSPS impact if unmitigated: \$465k
- Estimated cost to implement study: \$932k

**Table 4**  
**Comparison of Emergency Standby Power Alternatives**

	A. Minimum Contingency Preparation	B. Mobile Generator with Manual Transfer scheme	C. Permanent Generator with Automatic Power Transfer
Personnel Safety	Red	Yellow	Green
Response Time	Red	Yellow	Green
Reliability	Red	Green	Green
Equipment Risk	Red	Green	Green
Cost to Implement	Green	Yellow	Red
Savings from Power Loss	Red	Green	Green
Permitting Considerations	Green	Yellow	Yellow
Maintenance	Green	Yellow	Red

■ = Best Option  
■ = Acceptable  
■ = Least Preferred





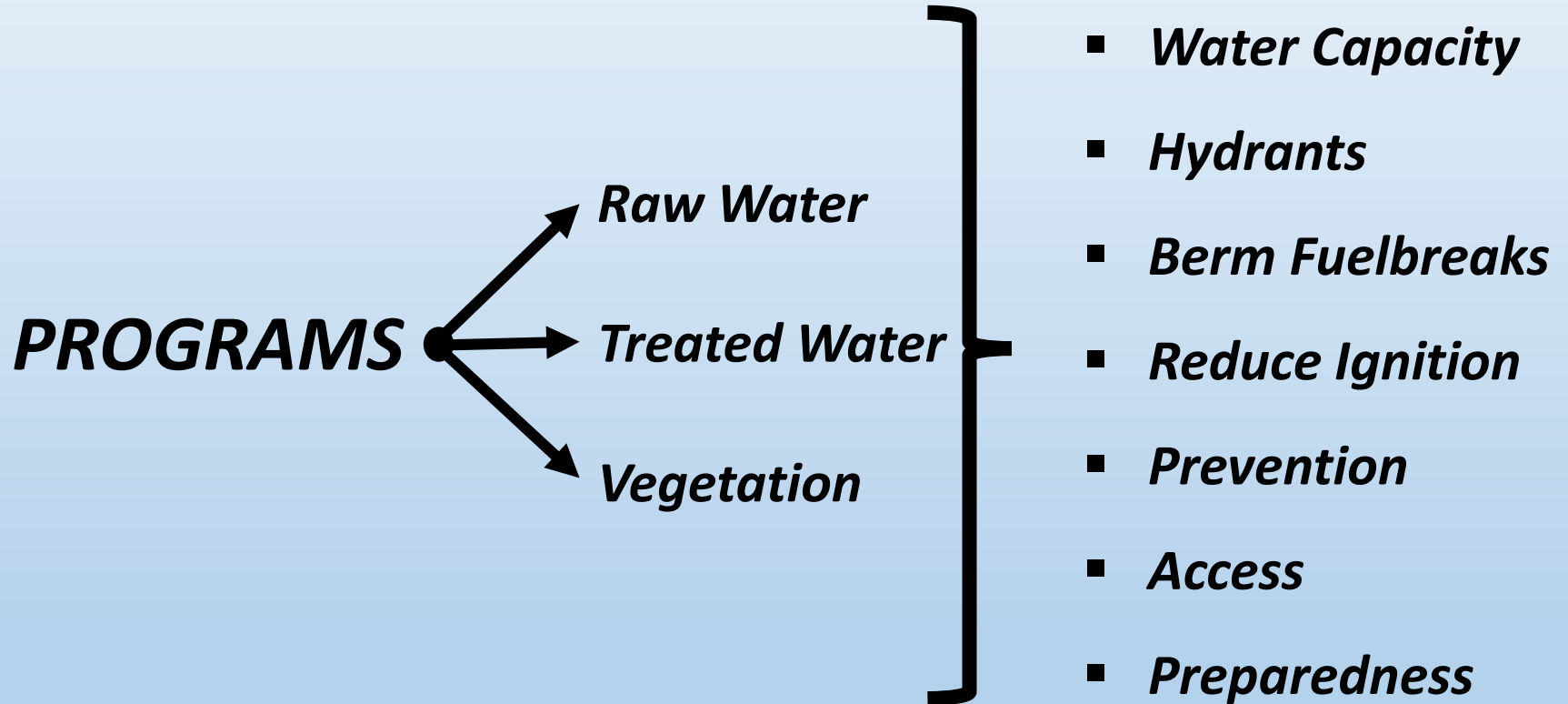
# Hydro: Powerhouse Fire Protection

- Program of internal fire system replacement for Chicago Park (2019), Dutch Flat #2 (2020), and Rollins (2021) Powerhouses developed.
- Initial steps of a plan to comprehensively look at fire protection at powerhouses including protection of individual equipment, current plant operations, and life safety.
- Study will consider both fires originating at the plant and protecting the plants from wildfire.





# *MAINTENANCE DEPARTMENT – FIRE RESPONSE & RESILIENCY*





# *MAINTENANCE DEPARTMENT: - Ongoing Projects*



**Water Capacity**

■ **Hydrants**

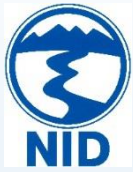
■ **Berm Fuelbreaks**

■ **Reduce Ignition**

**Prevention**

■ **Access**

■ **Preparedness**



# Pipeline Replacement Projects

- NID replaces aging pipeline as part of ongoing capital budget program
- During design local fire department review the plans for fire hydrant locations, fire hydrants added when requested –  
**1 hydrant every 1,000 feet**
- Penn Valley pipeline replacement project included a larger pipeline to improve fire flows in the area
- Replacement projects include replacement of the current wharf hydrants with dry barrel hydrants (more current and reliable)
- There are 2,554 hydrants in the Treated Water Systems

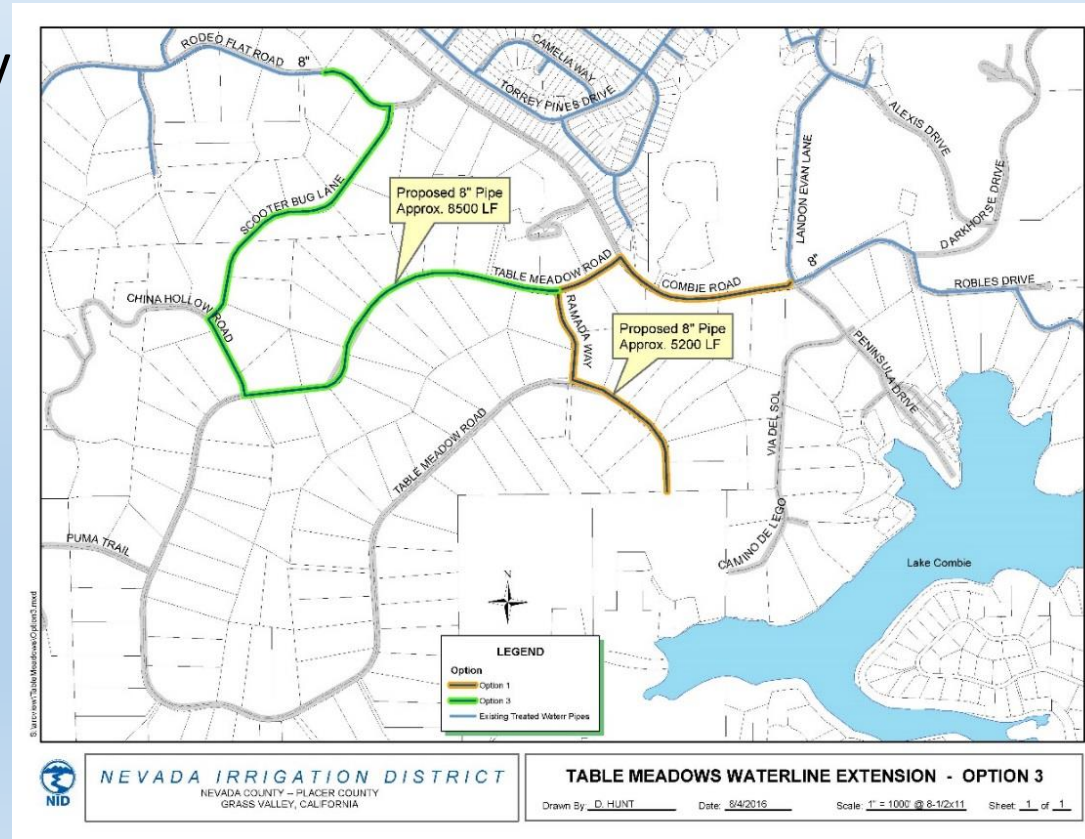






# Community Investment Program

- District works with residents of an area to provide water service with new infrastructure to communities
- Fire Hydrants installed every 1,000 feet as part of the project, paid through tax revenues
- Fire Hydrant locations coordinated with local fire departments
- Focus on better localized hydraulics to run systems
- Cascade Shores / Bear River Pines

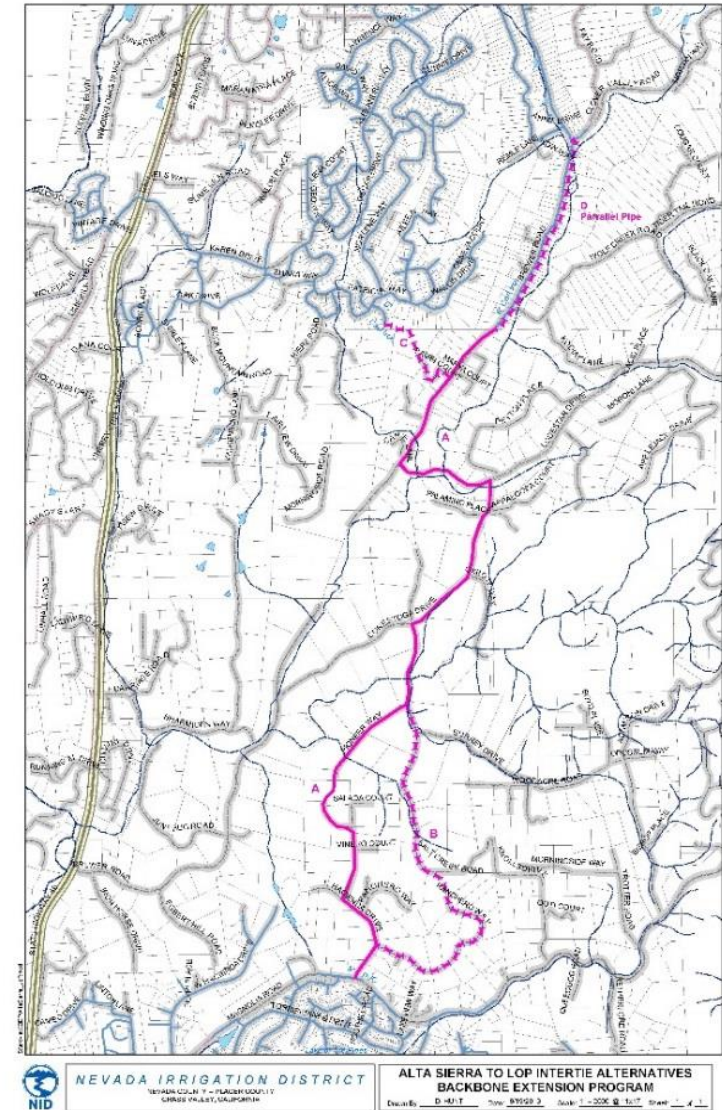




# Backbone Extension Program

## “Regionalization of Water Systems”

- Providing water lines into areas not currently served and providing benefits for District systems
- District and community benefits include redundancy for water systems & operations
- Connecting systems throughout service region
- New fire hydrants, one every 1,000 feet in residential areas, in new areas and water service which previously had no District water service
- Enhance fire system protection in the WUI (Wildland Urban Interface)
- Fire Hydrant locations reviewed and recommended by local fire department
- Projects include Lake of the Pines interconnection and Cascade Shores Pipeline





# Operations: Benefits of Treated Water Lines

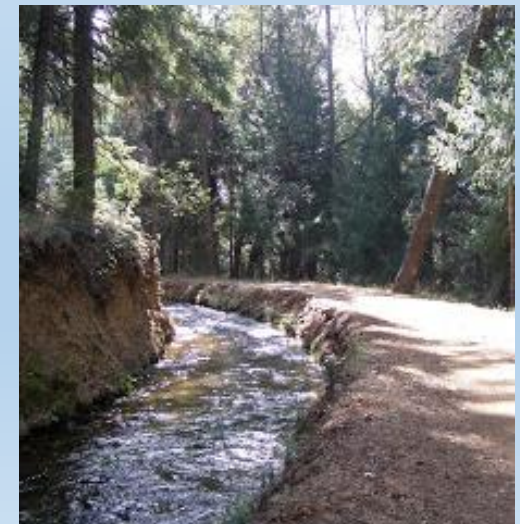
- Produce over 3 billion gallons of water a year for consumption and is the system supplying the fire hydrants
- Over 40 million gallons of domestic water in storage available to assist fire fighters during a fire
- NID supplies Cal Fire Bombers with water for retardant at the Nevada County Airport
- Water Treatment Plants and pump stations are equipped with backup generators or quick connect for continuous supply during a power outage
- During fire we maximize flows at plants and top off tanks
- Open interties with other systems
- Following fire; Isolate meters

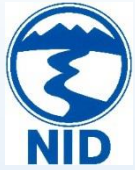




# Operations 24/7/365: Benefits of Irrigation Water

- 3 Counties
- 27 Water Storage Reservoirs
- 500 miles of canal and roughly 30,000 acres of irrigated land
- Ensure water flow to critical infrastructure, i.e. water treatment plants
- Provide information on critical water infrastructure to Cal Fire
- Increase canal flows in affected areas during fire (when accessible)
- Bring in extra crews to patrol and keep water flowing
- Shoulder season water / Demand water to private ponds as requested





QUESTIONS?