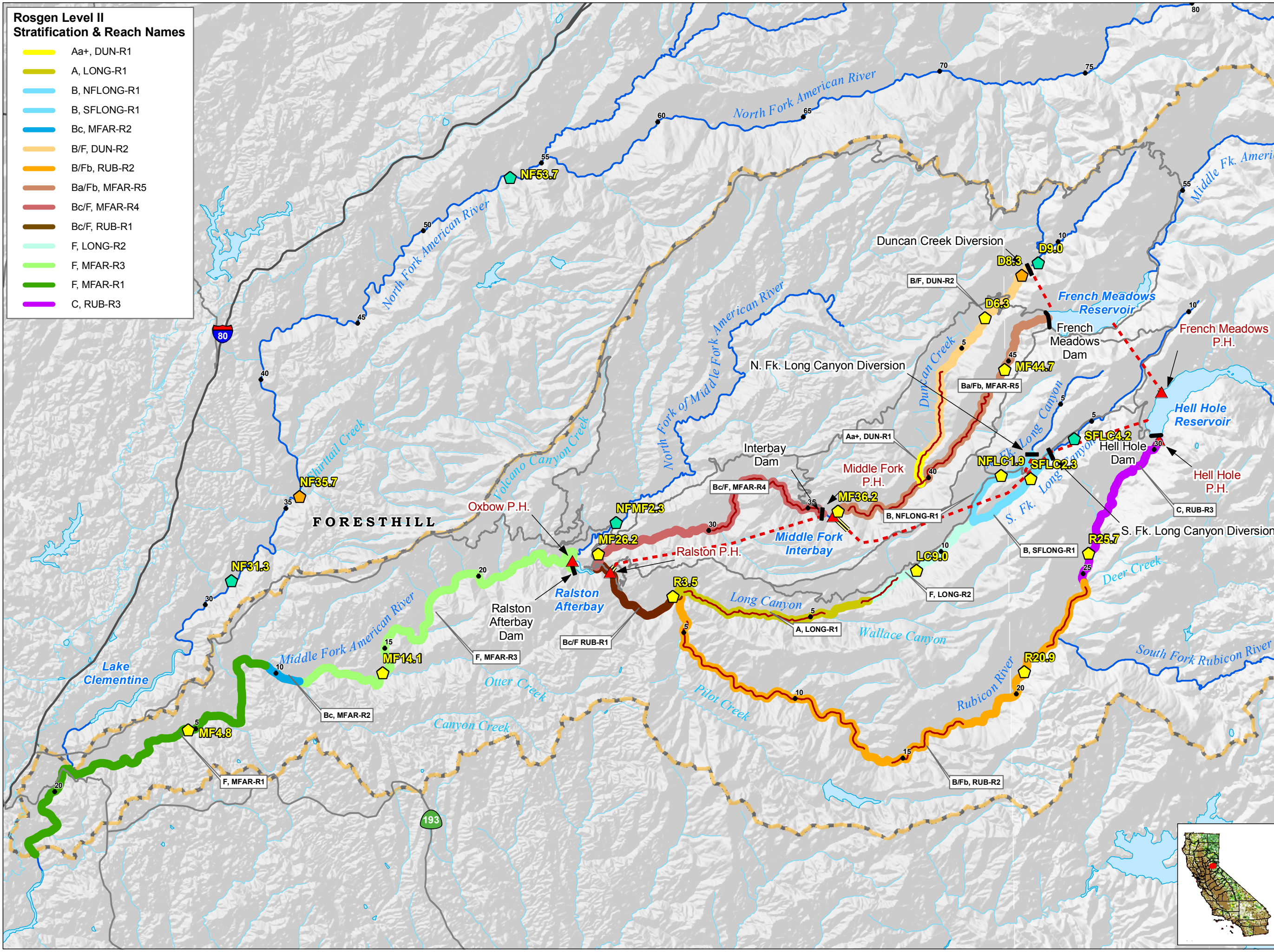



- ### Rosgen Level II Stratification & Reach Names
- Aa+, DUN-R1
 - A, LONG-R1
 - B, NFLONG-R1
 - B, SFLONG-R1
 - Bc, MFAR-R2
 - B/F, DUN-R2
 - B/Fb, RUB-R2
 - Ba/Fb, MFAR-R5
 - Bc/F, MFAR-R4
 - Bc/F, RUB-R1
 - F, LONG-R2
 - F, MFAR-R3
 - F, MFAR-R1
 - C, RUB-R3

- ### Project Facilities
- Powerhouse
 - Dam
 - Tunnel
 - Penstock
- ### Transportation
- Major Highway
 - Minor Highway
- ### Hydrography
- Watercourse with river miles (5 mi. increments)
 - Water Body
 - Middle Fork American River Watershed*
 - Inaccessible Stream Segment
- *Modified from Calwater Ver. 2.2 to represent drainage above high-water mark of Folsom Lake

- ### Study Site Locations
- Instream Flow Study Site
 - Limited Purpose Instream Flow Study Site
 - Comparison Reach Riparian Study Site







Placer County Water Agency
Middle Fork American River Project

Map 7.5-1

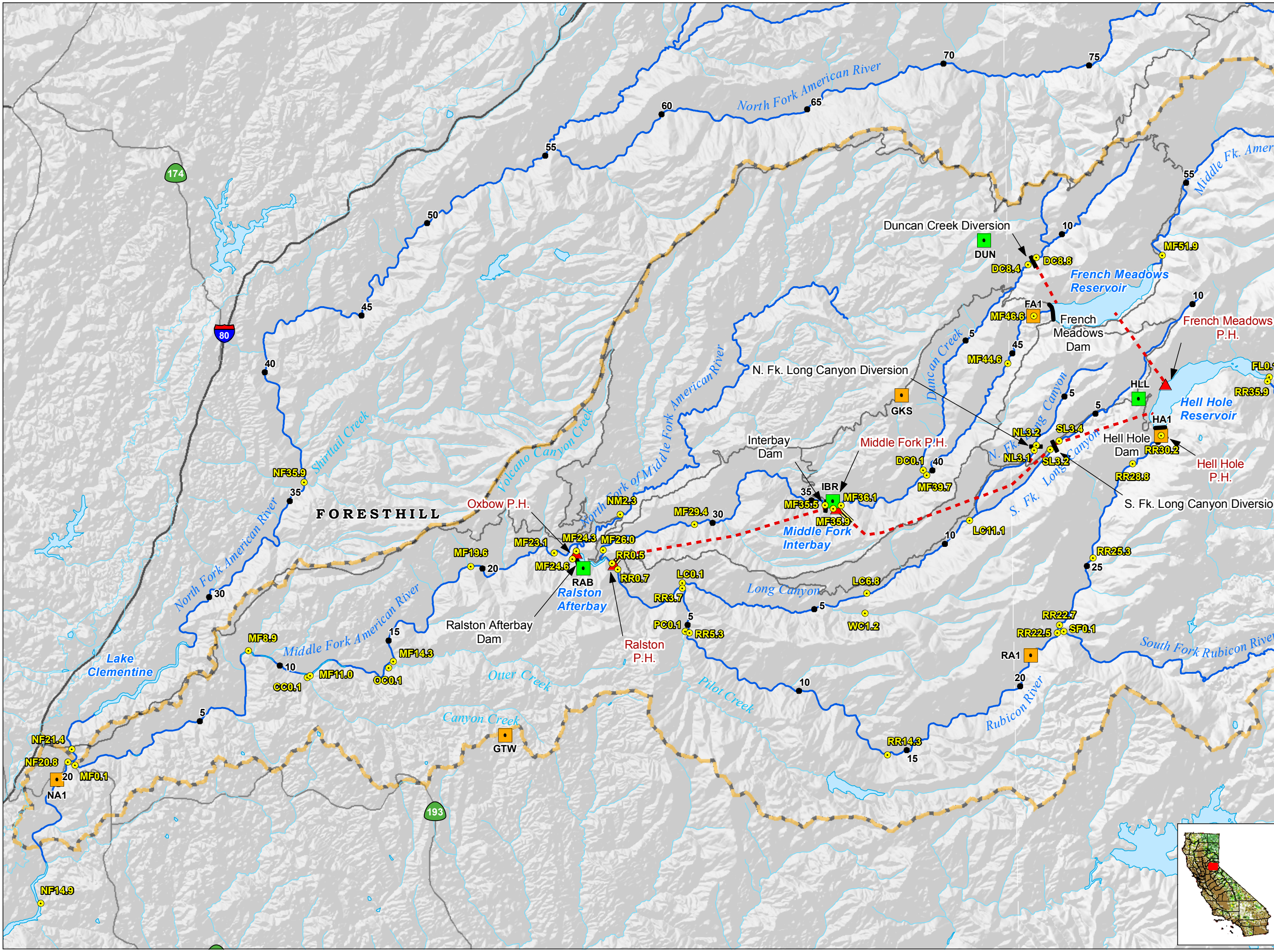
Middle Fork Project
Aquatic All-Discipline Study Sites



Date: 9/11/10



Projection: CA State Plane, Zone 2
Datum: NAD 83



- Project Facilities**
- Powerhouse
 - Dam
 - Tunnel
 - Penstock
- Transportation**
- Major Highway
 - Minor Highway
- Hydrography**
- Watercourse with river miles (5 mi. increments)
 - Water Body
- Water Temperature Monitoring Sites**
- Label denotes river name and river mile location
Ex. RR5.3 = Rubicon River at mile 5.3
- Meteorological Stations**
- Full Station
(Air temperature, Relative humidity, Solar radiation, Wind speed, Wind direction, Precipitation)
 - Partial Station
(Air temperature, Relative humidity)

PCWA

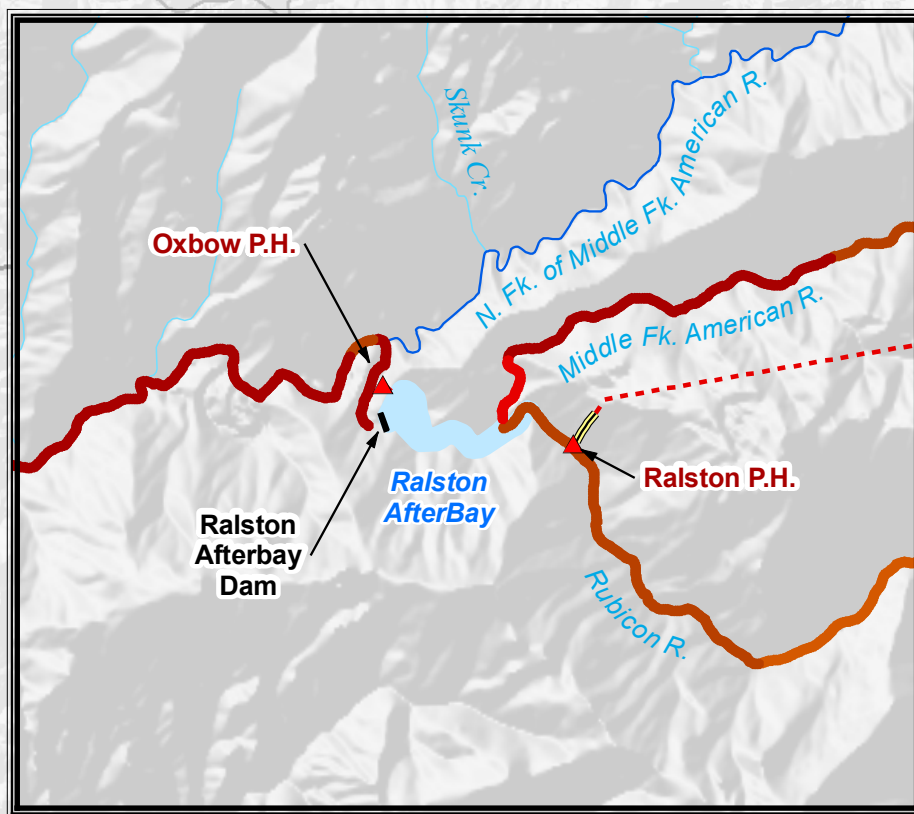
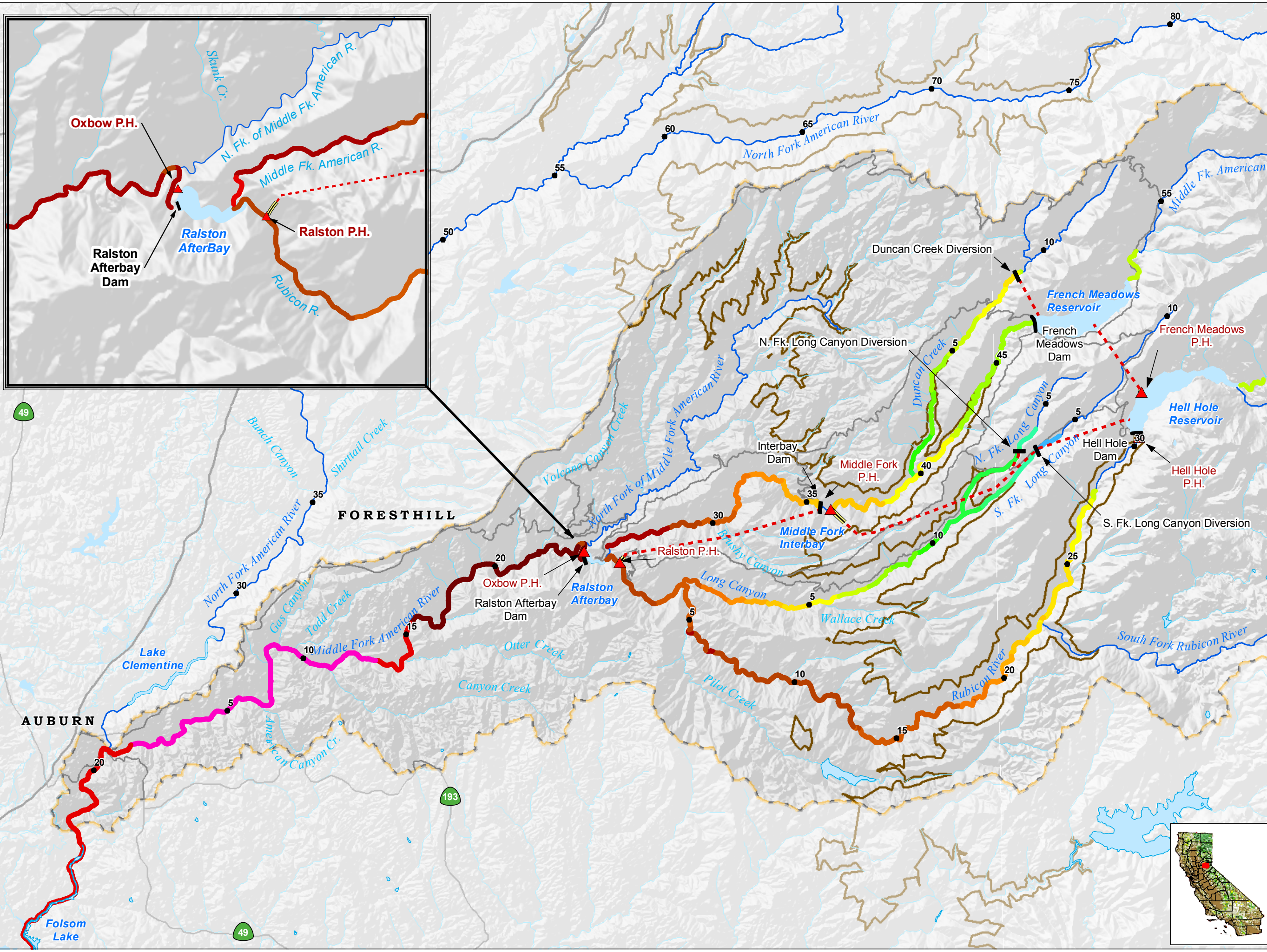
Placer County Water Agency
Middle Fork American River Project

Map 7.5-2
Water Temperature Monitoring and Meteorological Station Locations

0 1 2 3 Miles

Projection: CA State Plane, Zone 2
Datum: NAD 83

Date: 1/7/11



Project Facilities

- ▲ Powerhouse
- Dam
- - - Tunnel
- === Penstock

Transportation

- Major Highway
- Minor Highway

Hydrography

- Watercourse with river miles (5 mi. increments)
- Water Body
- Middle Fork American River Watershed*

*Modified from Calwater Ver. 2.2 to represent drainage above high-water mark of Folsom Lake

Hypsography

- 4500' Elevation

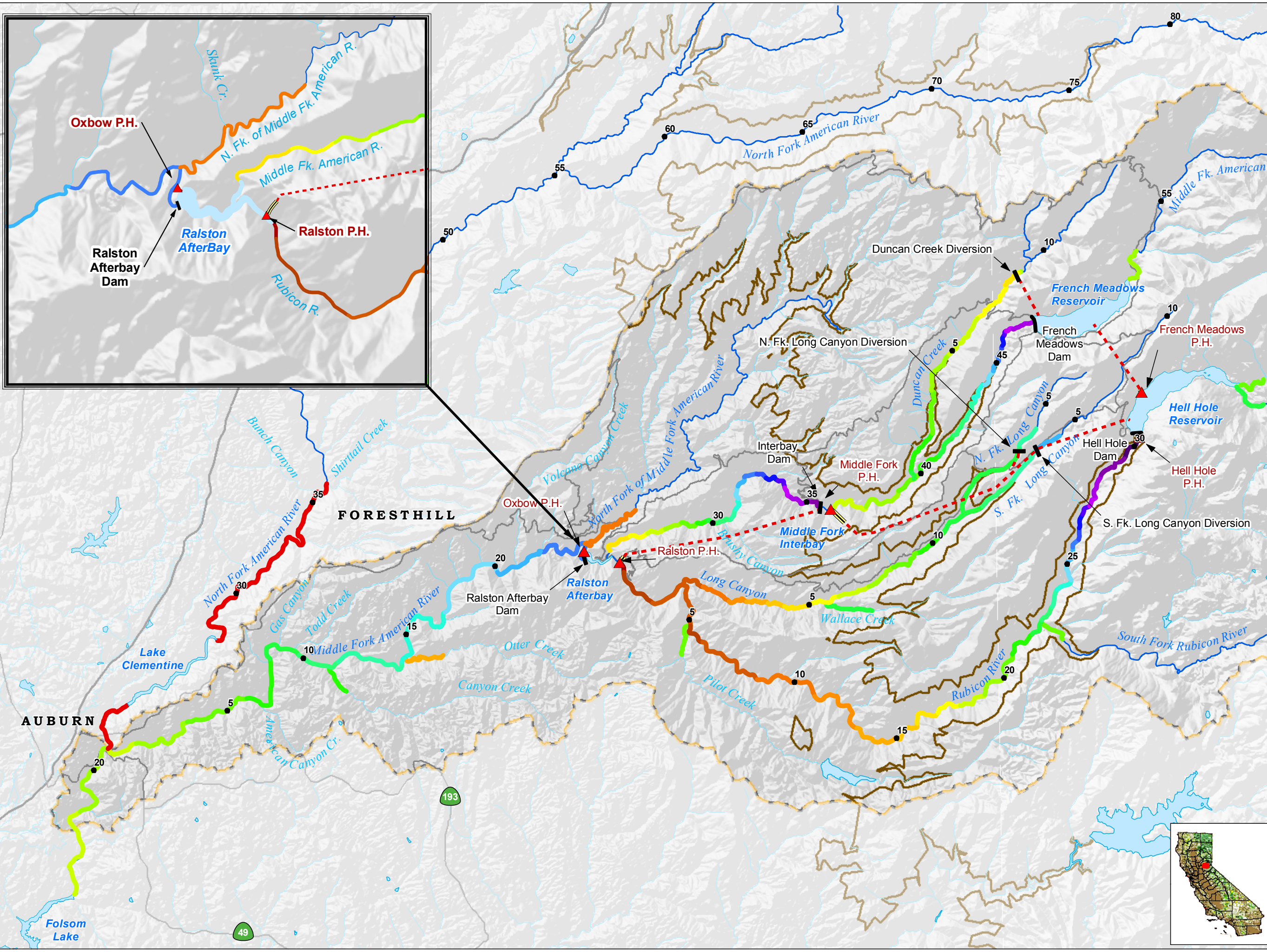
Average Water Temperature Unimpaired Flow August 2007

- 45 F
- 50 F
- 55 F
- 60 F
- 65 F
- 70 F
- 75 F

PCWA
Placer County Water Agency
Middle Fork American River Project

Map 7.5-3a
Average Water Temperatures in Study Streams in August 2007
Unimpaired Flow – Model Data

0 0.5 1 2 3 Miles
Projection: CA State Plane, Zone 2
Datum: NAD 83
Date: 9/15/10



Project Facilities

- ▲ Powerhouse
- Dam
- - - Tunnel
- === Penstock

Transportation

- Major Highway
- Minor Highway

Hydrography

- Watercourse with river miles (5 mi. increments)
- Water Body
- Middle Fork American River Watershed*

*Modified from Calwater Ver. 2.2 to represent drainage above high-water mark of Folsom Lake

Hypsography

- 4500' Elevation

Average Water Temperature August 2007

- 45 F
- 50 F
- 55 F
- 60 F
- 65 F
- 70 F
- 75 F

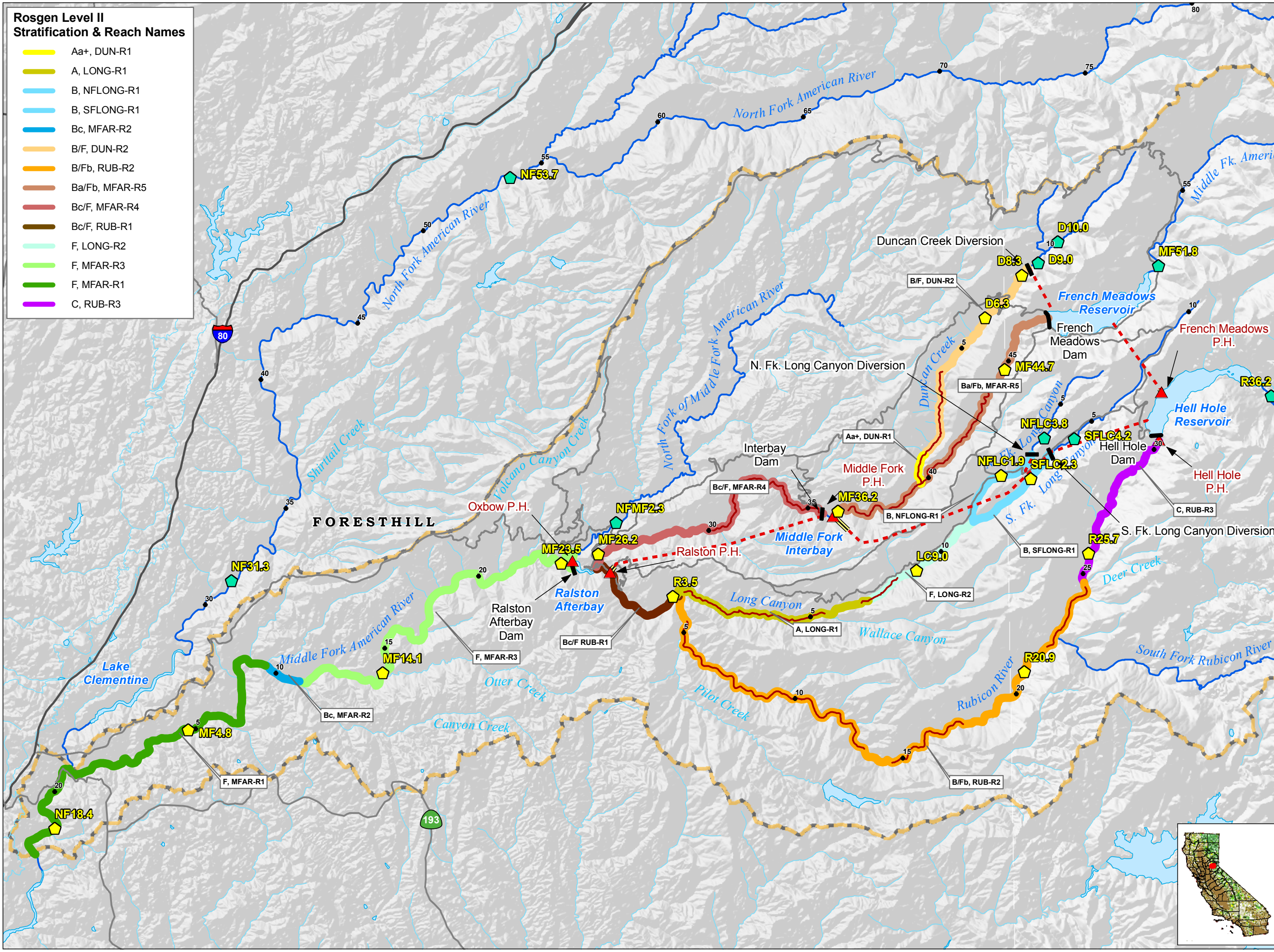
PCWA
Placer County Water Agency
Middle Fork American River Project
Map 7.5-3b
Measured August 2007 Average Water Temperature in Project Streams (Temperature Values Linearly Interpolated between Monitoring Locations)

0 1 2 3 Miles
Projection: CA State Plane, Zone 2
Datum: NAD 83
Date: 9/11/10

- Rosgen Level II Stratification & Reach Names**
- Aa+, DUN-R1
 - A, LONG-R1
 - B, NFLONG-R1
 - B, SF LONG-R1
 - Bc, MFAR-R2
 - B/F, DUN-R2
 - B/Fb, RUB-R2
 - Ba/Fb, MFAR-R5
 - Bc/F, MFAR-R4
 - Bc/F, RUB-R1
 - F, LONG-R2
 - F, MFAR-R3
 - F, MFAR-R1
 - C, RUB-R3

- Project Facilities**
- ▲ Powerhouse
 - Dam
 - - - Tunnel
 - = Penstock
- Transportation**
- Major Highway
 - Minor Highway
- Hydrography**
- Watercourse with river miles (5 mi. increments)
 - Water Body
 - Middle Fork American River Watershed*
 - Inaccessible Stream Segment
- *Modified from Calwater Ver. 2.2 to represent drainage above high-water mark of Folsom Lake

- Study Site Locations**
- ◆ Fish Population Study Site
 - ◆ Comparison Reach Fish Population Study Site



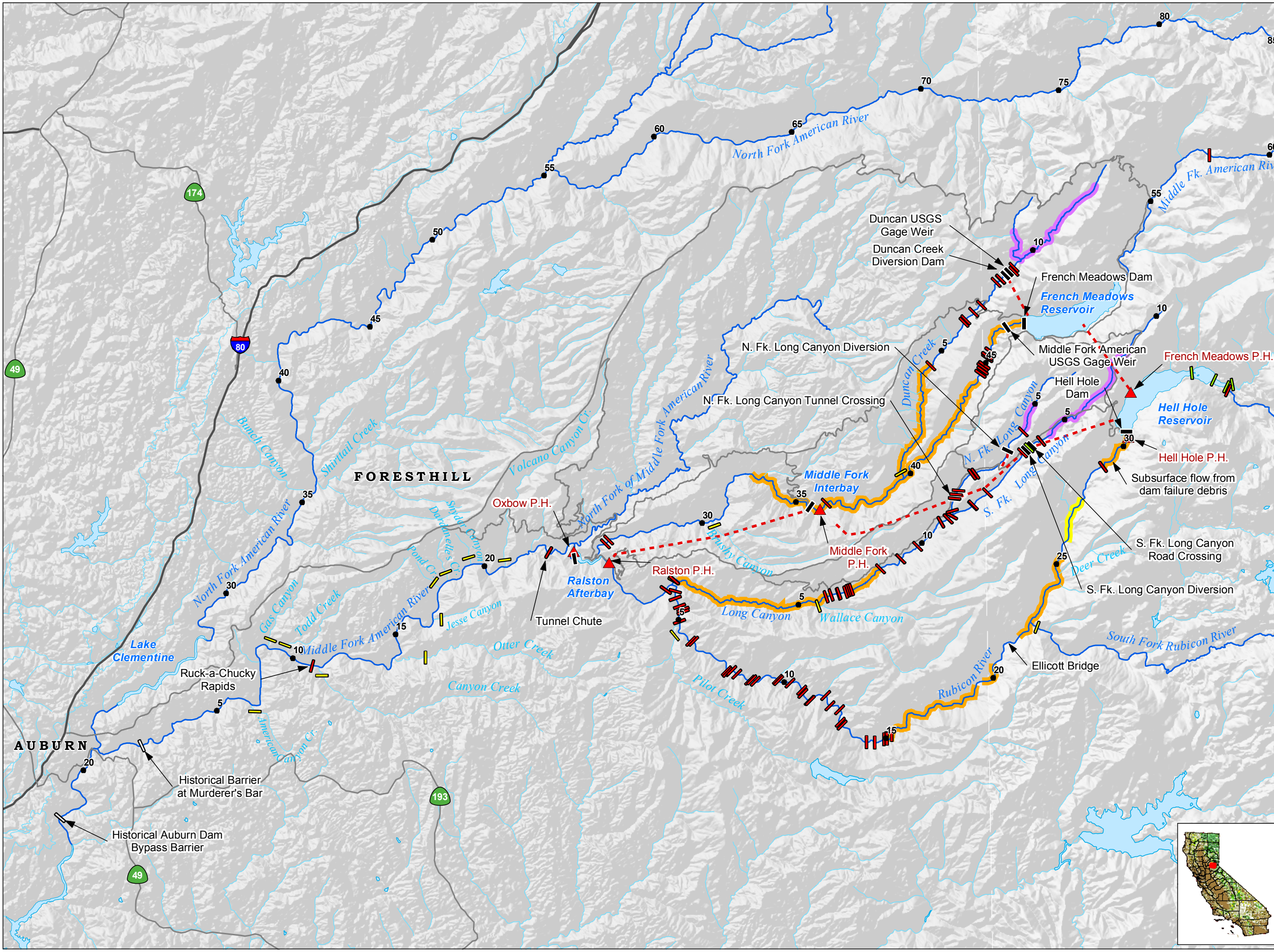
PCWA
Placer County Water Agency
Middle Fork American River Project

Map 7.5-4
2007 - 2008
Fish Population Study Sites

0 1 2 3
Miles

Projection: CA State Plane, Zone 2
Datum: NAD 83

Date: 1/7/11



Project Facilities

- ▲ Powerhouse
- - - Tunnel

Transportation

- Major Highway
- Minor Highway

Hydrography

- Watercourse with river miles (5 mi. increments)
- Water Body

Fish Passage Barrier Assessment*

- Project Infrastructure Barrier
- Reservoir/Diversion Pool Inlet Barrier
- Tributary Confluence Barrier
- Natural Barrier (Both Barriers and Potential Barriers)
- Historical Barrier Now Removed

* Includes barriers quantified as impassable and potentially impassable.

- Infrequent Natural Barriers Inferred from Aerial Imagery
- Frequent Natural Barriers Inferred from Aerial Imagery
- Additional Barriers Identified During Qualitative Stream Surveys

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Placer County Water Agency
Middle Fork American River Project

Map 7.5-5
Fish Passage Barrier Locations and Frequency

0 1 2 3
Miles

Projection: CA State Plane, Zone 2
Datum: NAD 83

Date: 9/11/10



Hydrography

- Whole River Miles
- 1/10 River Miles

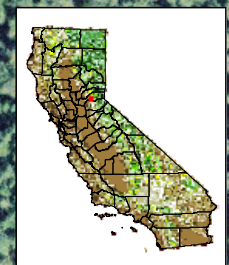
Study Areas

- ↔ Area of Stranding Study
- Stranding / Trapping Areas



Placer County Water Agency
Middle Fork American River Project

Map 7.5-6a
Gray Eagle Bar - American Bar
Stranding Study Area



0 125 250 Feet

Projection: CA State Plane, Zone 2
Datum: NAD 83

Date: 1/7/11



Hydrography

- Whole River Miles
- 1/10 River Miles

Study Areas

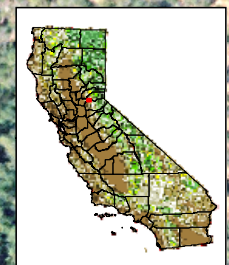
- Area of Stranding Study
- Stranding / Trapping Areas



Placer County Water Agency
Middle Fork American River Project

Map 7.5-6b

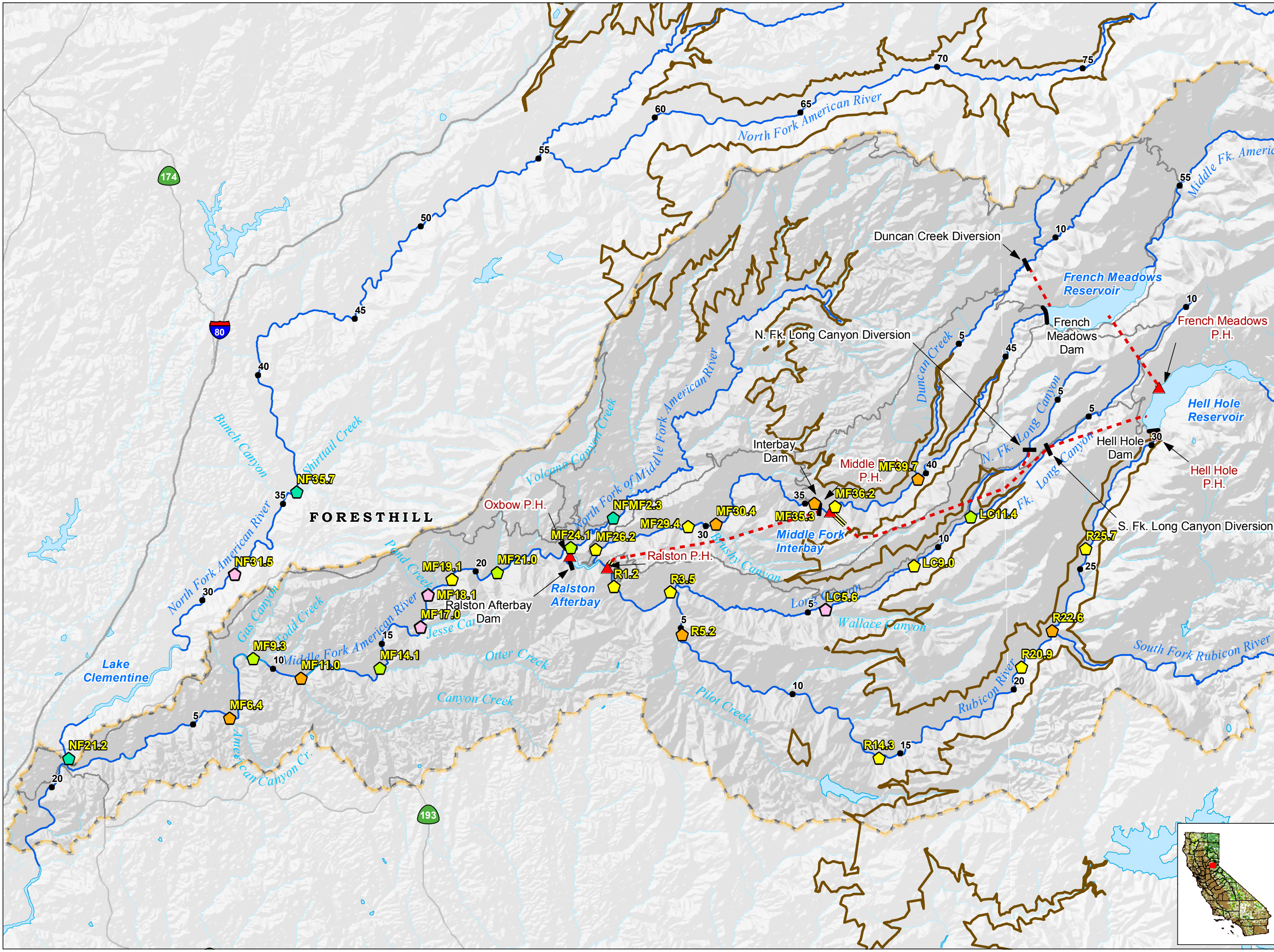
Fords Bar Stranding Study Area



0 125 250 Feet

Projection: CA State Plane, Zone 2
Datum: NAD 83

Date: 1/7/11



- Project Facilities**
- Powerhouse
 - Dam
 - Tunnel
 - Penstock
- Transportation**
- Major Highway
 - Minor Highway
- Hydrography**
- Watercourse with river miles (5 mi. increments)
 - Water Body
 - Middle Fork American River Watershed*
- *Modified from Calwater Ver. 2.2 to represent drainage above high-water mark of Folsom Lake
- Hypsography**
- 4500' Elevation
- Study Sites and Qualitative Sampling Locations**
- Representative Sites Typically at 2006 Geomorphic and Riparian Quantification Study Sites (QSS)
 - Additional Study Sites
 - Potential Comparison Reach Study Sites
 - One-time Qualitative Sampling Location
 - Incidental One-time Site Visit

PCWA

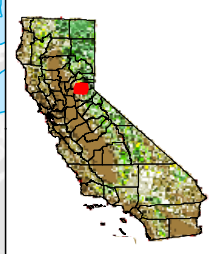
Placer County Water Agency
Middle Fork American River Project

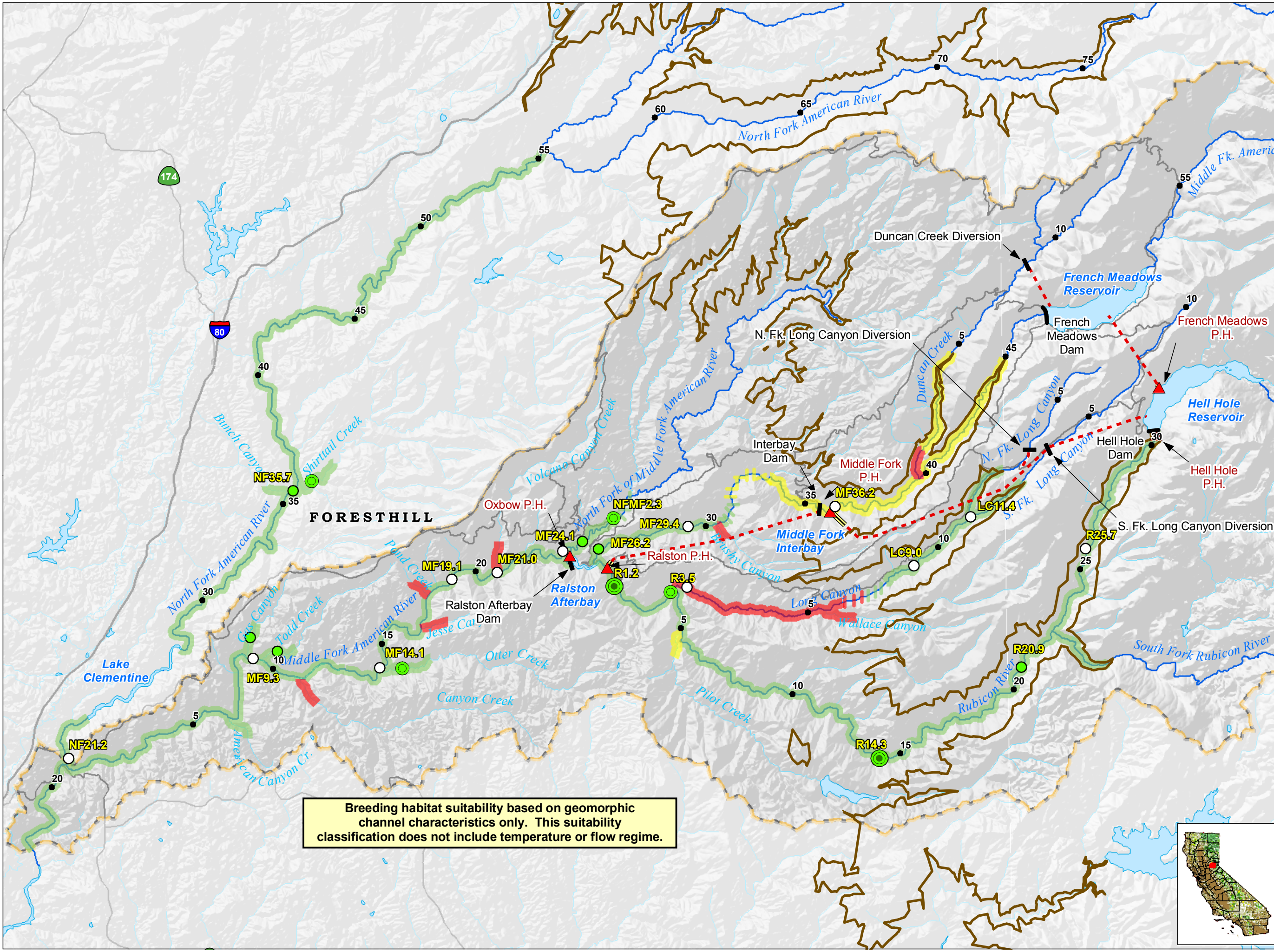
Map 7.5-7
Foothill Yellow-Legged Frog
Study Site Locations

0 1 2 3 Miles

Projection: CA State Plane, Zone 2
Datum: NAD 83

Date: 1/7/11





- Project Facilities**
- ▲ Powerhouse
 - Dam
 - - - Tunnel
 - === Penstock
- Transportation**
- Major Highway
 - Minor Highway
- Hydrography**
- Watercourse with river miles (5 mi. increments)
 - Water Body
 - Middle Fork American River Watershed*
- *Modified from Calwater Ver. 2.2 to represent drainage above high-water mark of Folsom Lake
- Hypsography**
- 4500' Elevation
- FYLF Habitat Suitability**
- Suitable
 - Limited - (Distribution of suitable habitat is patchy)
 - Unsuitable
 - Denotes transition zone between habitat suitability reaches
 - River not Assessed
- FYLF Spring Breeding Survey Study Sites**
- 0 Egg Masses Detected
 - 1 - 10 Egg Masses Detected
 - 11 - 20 Egg Masses Detected
 - 21 - 25 Egg Masses Detected

Breeding habitat suitability based on geomorphic channel characteristics only. This suitability classification does not include temperature or flow regime.

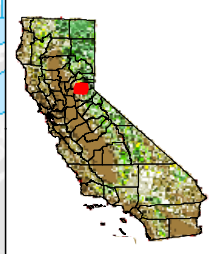
PCWA
Placer County Water Agency
Middle Fork American River Project

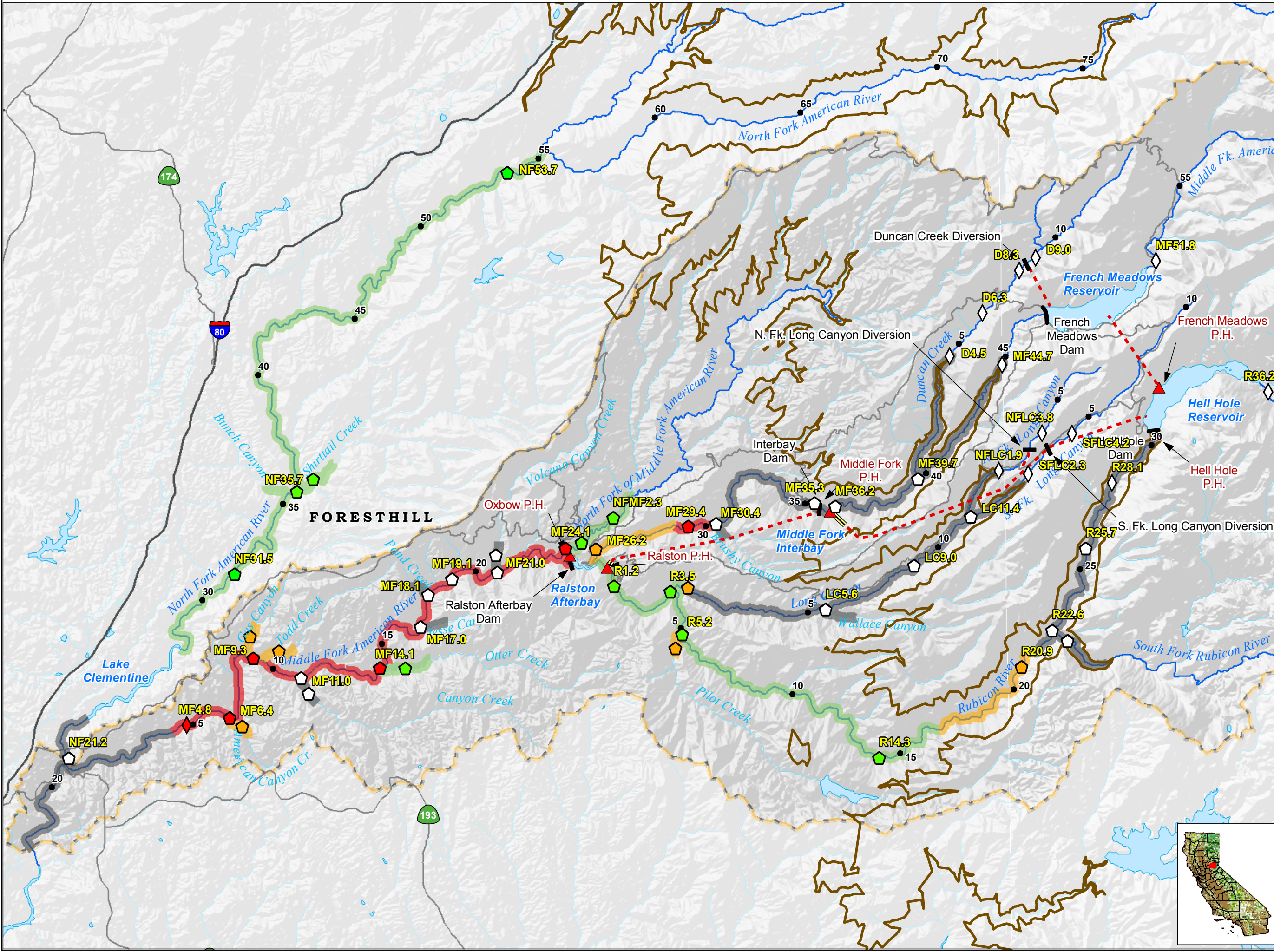
Map 7.5-8
Foothill Yellow-Legged Frog
Habitat Suitability

0 1 2 3
Miles

Projection: CA State Plane, Zone 2
Datum: NAD 83

Date: 1/7/11





Project Facilities

- ▲ Powerhouse
- Dam
- - - Tunnel
- ══ Penstock

Transportation

- Major Highway
- Minor Highway

Hydrography

- Watercourse with river miles (5 mi. increments)
- Water Body
- ▭ Middle Fork American River Watershed*

*Modified from Calwater Ver. 2.2 to represent drainage above high-water mark of Folsom Lake

Hypsography

- 4500' Elevation

Foothill Yellow-Legged Frog Abundance

- Abundant
- Common
- Rare
- Not observed

Incidental Observations during Fish Population, Geomorphic and Riparian Studies

- ◆ Rare
- ◇ Not Observed

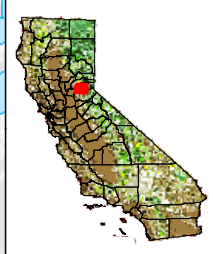
Inferred FYLF Abundance based on Study Site Observations

- Abundant
- Common
- Rare
- Not Observed
- Stream not surveyed



Placer County Water Agency
Middle Fork American River Project

Map 7.5-9
Foothill Yellow-Legged Frog
Distribution and Abundance



Projection: CA State Plane, Zone 2
Datum: NAD 83

Water Temperature and Dissolved Oxygen Profile Sampling Locations (2005-2008)



FM1

FM2

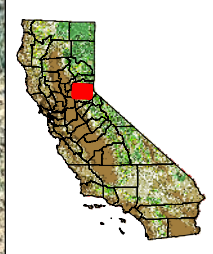
FM3



Placer County Water Agency
Middle Fork American River Project

Map 7.5-10a

**French Meadows Reservoir
Water Temperature and Dissolved Oxygen
Profile Sampling Locations (2005-2008)**



0 250 500 1,000
Feet

Projection: CA State Plane, Zone 2
Datum: NAD 83

Date: 4/9/10

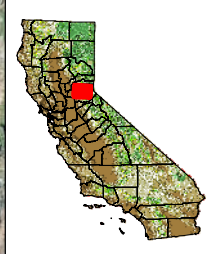
Water Temperature and Dissolved Oxygen Profile Sampling Locations (2005-2008)



Placer County Water Agency
Middle Fork American River Project

Map 7.5-10b

Hell Hole Reservoir
Water Temperature and Dissolved Oxygen
Profile Sampling Locations (2005-2008)

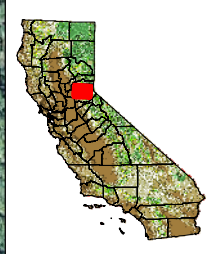


0 250 500 1,000
Feet

Projection: CA State Plane, Zone 2
Datum: NAD 83

Date: 4/9/10

Water Temperature and Dissolved
Oxygen Profile Sampling Locations
(2005-2008)



Placer County Water Agency
Middle Fork American River Project

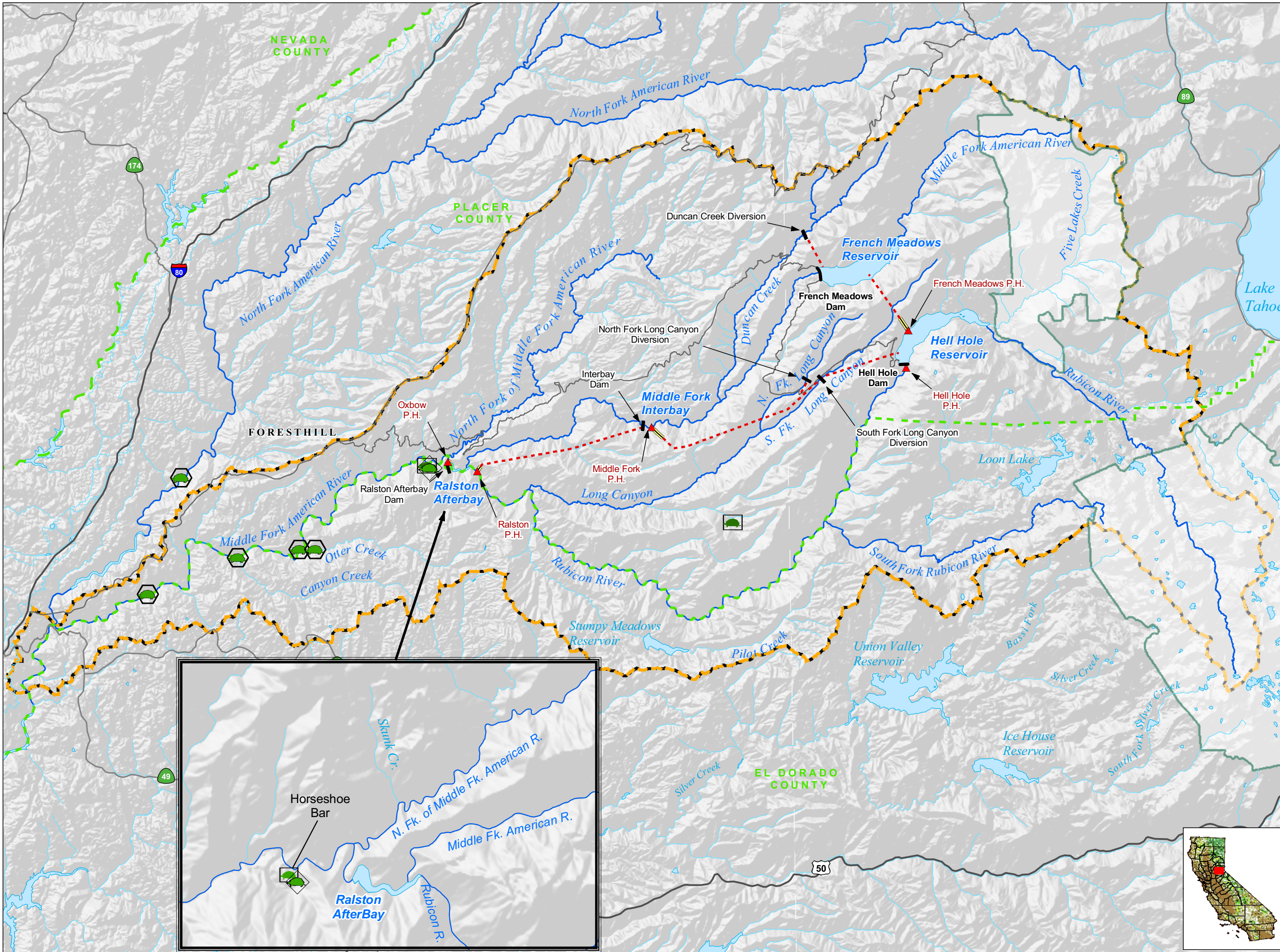
Map 7.5-10c

Ralston Afterbay
Water Temperature and Dissolved Oxygen
Profile Sampling Locations (2005-2008)



Projection: CA State Plane, Zone 2
Datum: NAD 83

Date: 4/9/10



Project Facilities

- ▲ Powerhouse
- Dam
- - - Tunnel
- == Penstock

Transportation

- Major Road
- Minor Road

Hydrography

- Watercourse
- Water Body
- Middle Fork American River Watershed*

Designated Boundary

- County Boundary
- Wilderness Area

Western Pond Turtle Sightings

- CNDDB Data (Point)
- USFS Data
- ◇ Jones & Stokes (2002) Data
- ⬢ ENTRIX (2007) Data

*Modified from Calwater Ver. 2.2 to represent drainage above high-water mark of Folsom Lake

PCWA
Placer County Water Agency
Middle Fork American River Project
Map 7.5-11
Western Pond Turtle Incidental Sightings
in the Middle Fork American River Watershed

0 1 2 3 4 5 Miles
Projection: CA State Plane, Zone 2
Datum: NAD 83
Date: 12/11/07