YUBA COUNTY WATER AGENCY

Yuba River Development Project
FERC Project No. 2246

STUDY 3-4
SPECIAL-STATUS AMPHIBIANS –
FOOTHILL YELLOW-LEGGED FROG SURVEYS

SITE SELECTION INFORMATION PACKAGE

March 2011

1.0 Middle Yuba River – Our House Diversion Dam Reach and Oregon Creek Reach

The Middle Yuba River extends 12.0 mi from Our House Diversion Dam downstream to the confluence of the Middle Yuba River with the North Yuba River and is split into two reaches. Our House Diversion Dam Reach extends from Our House Diversion Dam 7.5 mi downstream to Oregon Creek. Oregon Creek Reach extends 4.5 mi downstream from Oregon Creek to the North Yuba River confluence. Information used to evaluate conditions on these reaches and investigate accessibility included a field reconnaissance on March 9, 10, and 11, 2011. Additional information was collected in September 2009 as part of the Habitat Mapping Report (YCWA 2010).

Generally the potential effects of the Project in the reaches are associated with a reduction in flows compared to flows arriving at the diversion dams during runoff when the Project is diverting. Under Article 33 of the current license, YCWA is required to maintain minimum streamflow releases in wet and normal years during the periods from April 15 through June 15 and from June 16 through April 14 as follows: 50 cfs and 30 cfs, respectively, or the natural flow, whichever is less, below Our House Diversion Dam. This article provides for reductions in these minimum streamflow requirements in critically dry water years. YCWA typically operates New Bullards Bar Reservoir by capturing winter and spring runoff from rain and snowmelt. The reservoir normally reaches its peak storage at the end of the spring runoff season, and then is drawn down until its lowest elevation in early to mid-winter. Storm runoff operations occur during the storm season, typically between October and May, and include operations to avoid or reduce uncontrolled flows. The capacity of the Lohman Ridge Diversion Tunnel from the Our House Diversion is 860 cfs. Storm flows that exceed the diversion capacity are spilled. Review of the period of record (1968-2008) indicates that spills as late as May occurred in 12 of the 40 years (1971, 1974, 1975, 1978, 1979, 1980, 1993, 1996, 1998, 1999, 2003, and 2005); these spills occurred as late as June in 7 of those years (1971, 1974, 1975, 1978, 1993, 1998, and 2003) and as late as July in one year (1975). Spills represented relatively abrupt changes in flow of varying magnitude.

Based on channel classification and habitat mapping performed for the PAD (YCWA 2010) (Figure 1.0-1), the Middle Yuba River between Our House Diversion Dam and the confluence with the North Yuba River is characterized as follows. The Middle Yuba River flows through a variety of parent materials, most notably resistant granitic rocks, and is bisected by the Big Bend-Wolf Creek fault within 1 mi of the junction with the North Yuba River. The overall gradient is 1.2 percent, with one gradient break at the Big Bend/Wolf Fault (2.5 percent gradient below the fault, and 1.1 percent gradient above). There are numerous lower gradient sections, many of which are upstream of sharp bends that form "knickpoints."[1] However, in any of these lower gradient sections where it appears that there is floodplain and side-channel development, sinuosity never exceeds 1.1 (i.e., valley length and channel length through the valley are approximately equal). Stream macrohabitat is dominated by mid-channel pools, low gradient riffles, and runs (Table 1); additional habitat types occurring in more than 5 percent of the total mapped habitat units include high gradient riffles, lateral pools and trench pools. Six tributaries are distributed along Our House Diversion Dam Reach (one is perennial: Grizzly Creek), and

[1] A knickpoint is a term used to describe a location in a river or channel where there is a sharp change, resulting from differential rates of erosion above and below the knickpoint.

there are five tributaries on Oregon Creek Reach (four are perennial: Oregon Creek, Moonshine Creek, Clear Creek and Mary's Ravine/Yellowjacket Creek).

1.1 Our House Diversion Dam Reach

Our House Diversion Dam Reach is accessible from the USFS Oregon Creek Day Use Area near the confluence with Oregon Creek, and from Our House Diversion Dam. The remainder of the reach is surrounded by private property with gated roads and would be difficult to access for surveys.

Our House Diversion Dam Reach has been divided into sections based on channel morphology, presence of potential FYLF habitat, and accessibility (Table 1.0-1). Analysis of available stream habitat mapping data and the March 2011 reconnaissance indicates that potentially suitable habitat along Our House Diversion Dam Reach occurs near the confluence of Oregon Creek, RM 4.6, upstream to RM 9.0, and in patches from RM 11.0 to 12.0. A survey site up to 1,000 m in length likely could be established in Section 1. A survey area of 750 meters might be established in Section 3 near the Our House Diversion Dam access point; however, the survey site would not comprise contiguous habitat since there are several areas with unsuitable habitat such as cascades and bedrock-confined trench pools and lateral pools. Section 2 is inaccessible for conducting surveys. Potential Project effects in Our House Diversion Dam Reach should be greatest just below Our House Diversion Dam, but the magnitude of accretion along the reach is not precisely known.

1.2 Oregon Creek Reach

Oregon Creek Reach is accessible at two points. The downstream end of the reach, at the confluence with North Yuba River, is accessible via a YCWA road. The upstream end of the reach is accessible from unmarked roads near the Highway 49 crossing. The remainder of the reach is surrounded by private property with gated private roads, and would be difficult to access for surveys.

Oregon Creek Reach has been divided into sections based on channel morphology, presence of potential FYLF habitat, and accessibility (Table 1.0-1). Potentially suitable habitat along Oregon Creek Reach mainly occurs at the confluence with the North Yuba River, and in relatively contiguous sections from the Highway 49 crossing downstream to RM 0.6. Suitable habitat is primarily associated with low gradient riffles and pool tail-outs with boulder and cobble-dominated substrates. Immediately upstream of the North Yuba River confluence along Section 1, suitable habitat is limited in extent and is scattered; contiguous suitable habitat does not exceed 400 m in length. A survey site at least 900 m length could be situated at the upstream end of the reach, in Section 3. Section 2 is inaccessible. It may be possible to extend or shift the survey site in Section 1 to include the upstream portion of the Middle/North Yuba Reach of the Yuba River or the downstream portion of the New Bullards Bar Dam Reach of the North Yuba River. The potential Project effects in Oregon Creek Reach are likely to be greatest near the confluence with the North Yuba River and with Oregon Creek, but the magnitude of accretion along the reach is not precisely known.

Included Materials **Page**

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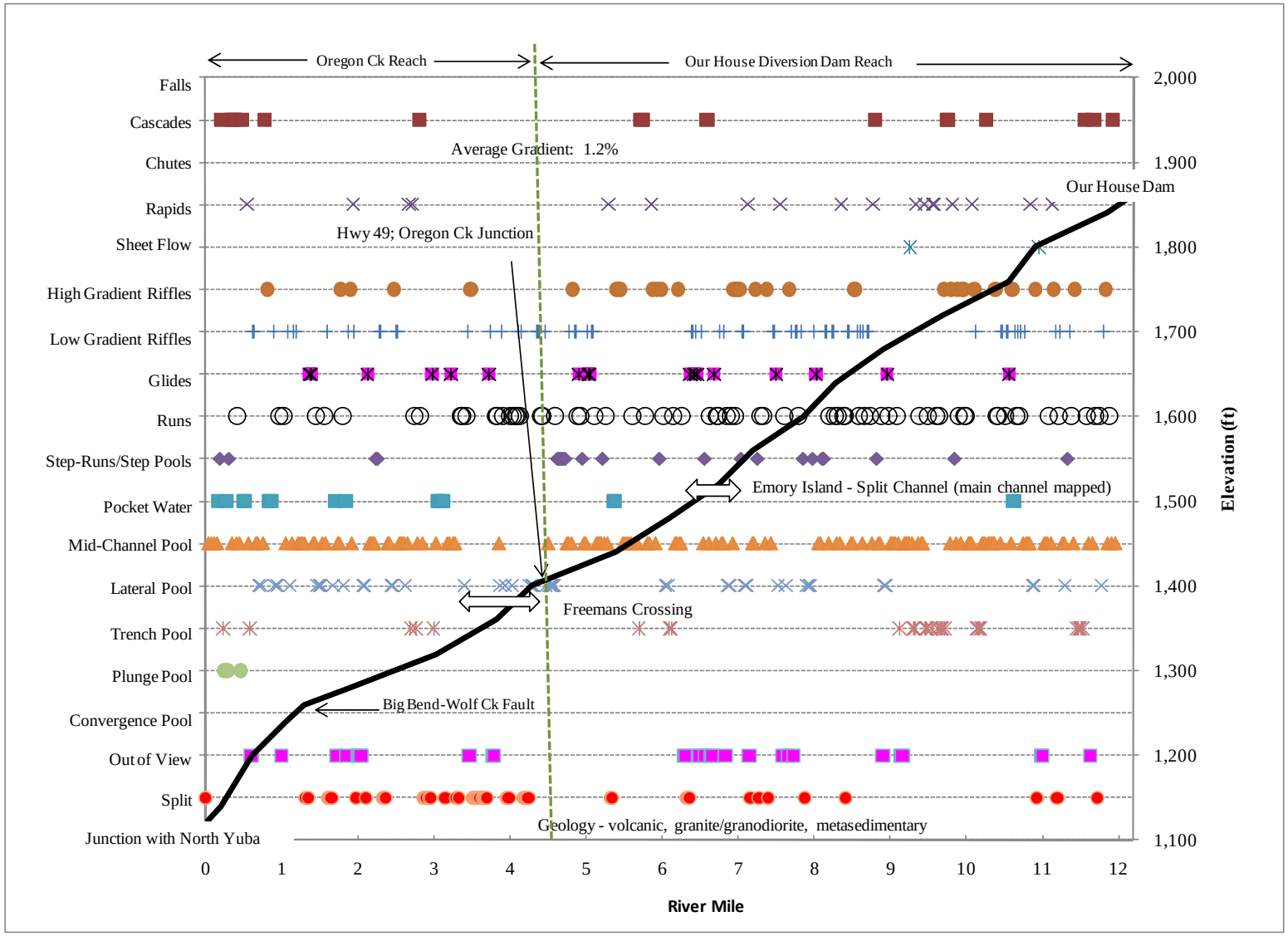

Figure 1.0-1. Middle Yuba River – Our House Diversion Dam Reach and Oregon Creek Reach longitudinal profile and habitat units (based on video-mapped data) from Habitat Mapping Report (YCWA 2010).

Table 1.0-1. Middle Yuba River - Our House Diversion Dam Reach and Oregon Creek Reach descriptions and access considerations

Section/ River Mile	Description of Section	Presence of potential FYLF breeding habitat	FYLF Records	Site Access
Our House Diversion Dam Reach				
Section 1 RM 4.5 to 5.5	Predominant stream habitat types are mid-channel pools, step runs/step pools, and runs. Bankfull width averages 28 m. Boulders and cobbles are dominant substrates. Margin vegetation consists of patchy grasses/ forbs and shrubs/saplings. Overhanging vegatation is moderately dense deciduous shrubs and saplings. One tributary occurs along this section.	Potential breeding and rearing habitat such as pools and low-velocity edgewater and suitable substrate are common throughout this section. Pockets of high-gradient riffles break up contiguous suitable habitat. Sufficient sun exposure on stream margins.	• USFS and CDFG record at Middle Yuba River/Oregon Creek confluence	• Accessible from Oregon Creek Day Use Area near RM 4.5 upstream to RM ~5.5 during low flows. Accessible to at least RM 5.1 during higher flows. • Some portions of stream shoreline consist of steep bedrock/boulders, and thus are not wadeable.
Section 2 RM 5.5 to 11	Predominant stream habitat types are runs, low-gradient riffles, and lateral pools. Bankfull width averages 28 m. Boulders and cobbles are dominant substrates. Margin and overhanging vegetation is moderately dense deciduous shrubs and saplings. Four tributaries occur along this section.	Potential breeding and rearing habitat such as pools and low-velocity edgewater are common from throughout this section. Boulder and cobble/gravel substrates are also common. Higher-gradient, bedrock-confined areas occur from RM 9.0 to RM 11. Margin and overhanging vegetation does not preclude sun exposure along most of this section.	• No FYLF records	• Access throughout this section is limited to gated private roads and private property. Unable to gain permission to access private land • RM 10.8 to 10.9 abuts SPI land on the right bank.
Section 3 RM 11 to 12	Predominant stream habitat types are mid-channel pools, runs, and high-gradient riffles. Bankfull width averages 15 m. Boulders and cobbles are dominant substrates. Margin vegetation consists of patchy grasses/ forbs and shrubs/saplings. Overhanging vegetation is patchy deciduous shrubs and saplings. One tributary occurs along this section.	Potential breeding and rearing habitat such as pools and low-velocity edgewater and suitable substrate are patchy in this section. Higher-velocity stream features such as cascades and high-gradient riffles are interspersed throughout . Margin and overhanging vegetation does not preclude sun exposure along most of this section.	• USFS occurrence record near RM 11.7	• Access from Our House Diversion dam downstream to ~ RM 11 during low flows. Access is limited to about 0.2 RM downstream of dam during higher flows. Spills may occur during high flows.

Section/ River Mile	Description of Section	Presence of potential FYLF breeding habitat	FYLF Records	Site Access
Oregon Creek Reach				
Section 1 RM 0.0 to 0.3	Predominant stream habitat types are mid-channel pool, pocket water, step-runs/step pools and cascades. Bankfull width averages 20 m. Dominant substrate consists of bedrock. Margin consists of scattered shrubs. Negligible overhanging vegetation. No tributaries occur along this section.	Potential breeding and rearing habitat is mostly limited to the confluence with the North Yuba River where the substrate is more suitable (patches of cobble, less boulder/bedrock dominated). Steeper gradient occurs upstream of the confluence, and is dominted by stream habitat and substrate less suitable for breeding and rearing (i.e., cascades, bedrock-dominated substrate. Sufficient sun exposure on stream margins.	• No FYLF records	• Accessible from YCWA access road. Traversible from confluence of Middle Yuba River and North Yuba River upstream to RM 0.3 during low flows. At high flows, reach is accessible up to RM 0.1. • Some portions of the stream shoreline consist of steep bedrock/ boulders, and thus are not wadeable.
Section 2 RM 0.3 to 3.4	Predominantly mid-channel pools, lateral pools, and low-gradient riffles. Several splits. No ground data on bankfull width. Dominant substrate appears to mainly consist of boulders and bedrock; cobble substrate more predominant at splits. Margin and overhanging vegetation ranges from sparse shrub cover in bedrock-confined areas to dense/moderately dense shrub cover at splits and cobble bars. Four tributaries occur along this section.	Potential breeding and rearing habitat such as pools and low-velocity edgewater are common throughout this section, mainly upstream of RM 0.6. Boulder and cobble/gravel substrate are also common. Higher-gradient areas and unsuitable habitat sporadically occurs through section. Margin and overhanging vegetation does not preclude sun exposure along most of this section.	• No FYLF records	• Access throughout this section is limited to gated private roads and private property. Unable to gain permission to access private land.
Section 3 RM 3.4 to 4.5	Predominant stream habitat types are runs, low-gradient riffles, and lateral pools. Bankfull width averages 28 m. Boulders and cobbles are dominant substrates. Margin vegetation consists of patchy grasses/ forbs and shrubs/saplings. Overhanging vegetation is moderately dense deciduous shrubs and saplings. One tributary occurs along this section.	Low-gradient stream section with relatively contiguous areas of low-velocity pools and edgewater. Suitable substrate consisting of boulders and cobbles throughout section. Substrate is predominantly bedrock through this segment. Margin and overhanging vegetation does not preclude sun exposure along most of this section.	• No FYLF records	• Easy access from old logging road on south side of HWY 49 crossing. Wadeable for ~ 1 RM downstream of HWY 49 crossing.

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Figure 1.0-2. Middle Yuba River – Our House Diversion Dam Reach: overview topography. The approximate extent of the March 2011 reconnaissance areas are demarcated by red dots (two short sections).

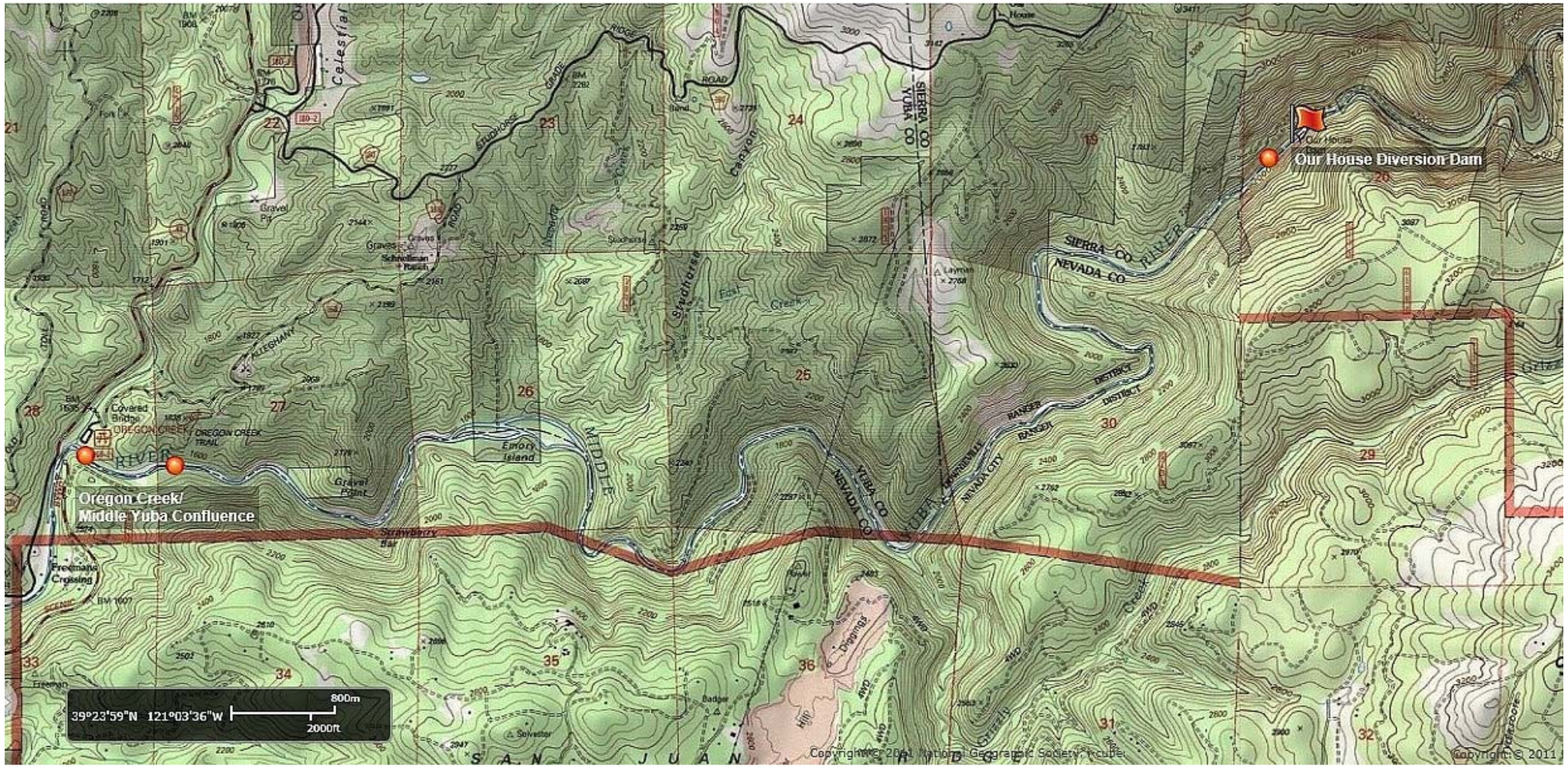


Figure 1.0-3. Middle Yuba River – Our House Diversion Dam Reach: overview aerial image. The approximate extent of the March 2011 reconnaissance areas are demarcated by red dots (two short sections; the upper limit of the upstream section is Our House Diversion Dam). Concentric red circles indicate approximate extent of inaccessible middle section of reach (private property accesss issues or stream is not traversible during low flows or with boat).

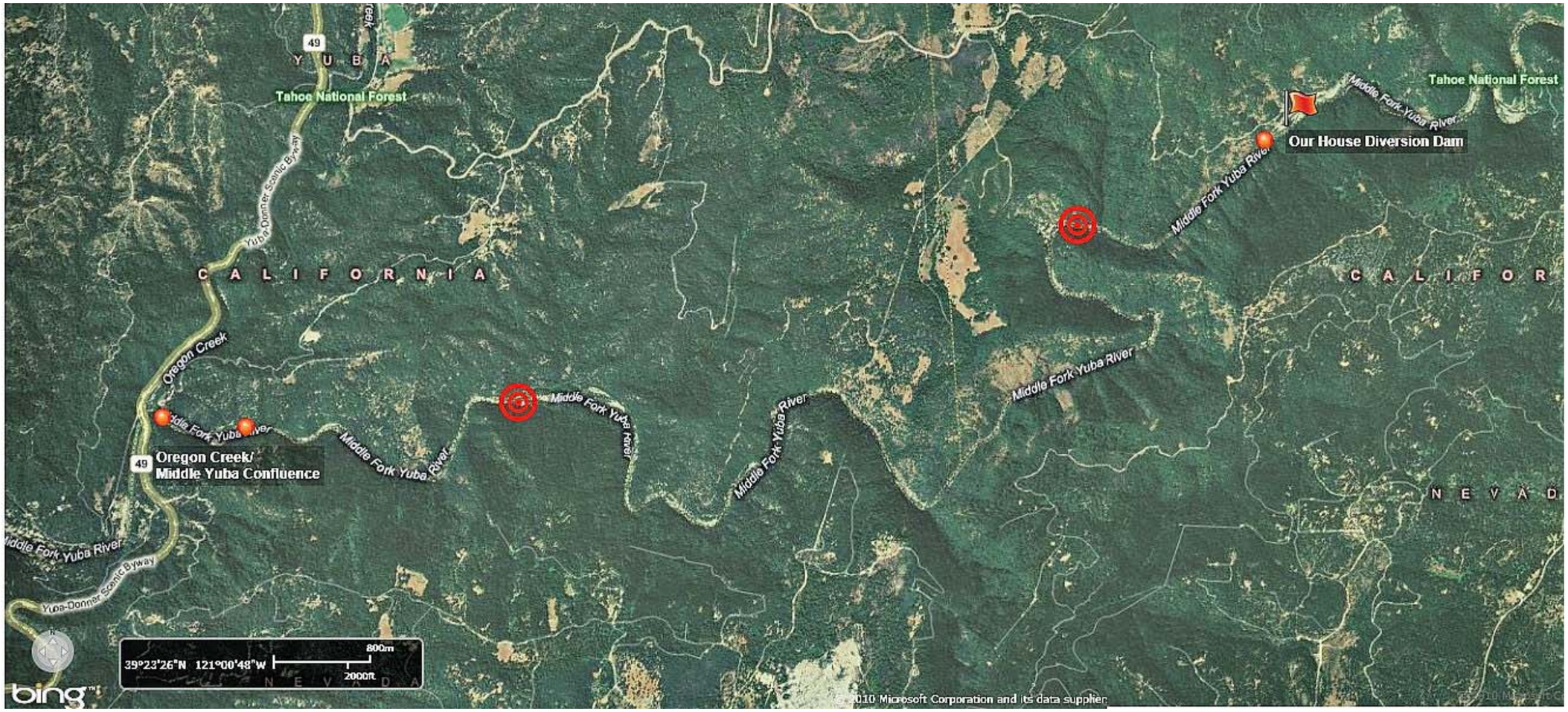


Figure 1.0-4. Middle Yuba River – Our House Diversion Dam Reach: aerial image of downstream section investigated in March 2011. The approximate extent of the March 2011 reconnaissance area is demarcated by red dots.

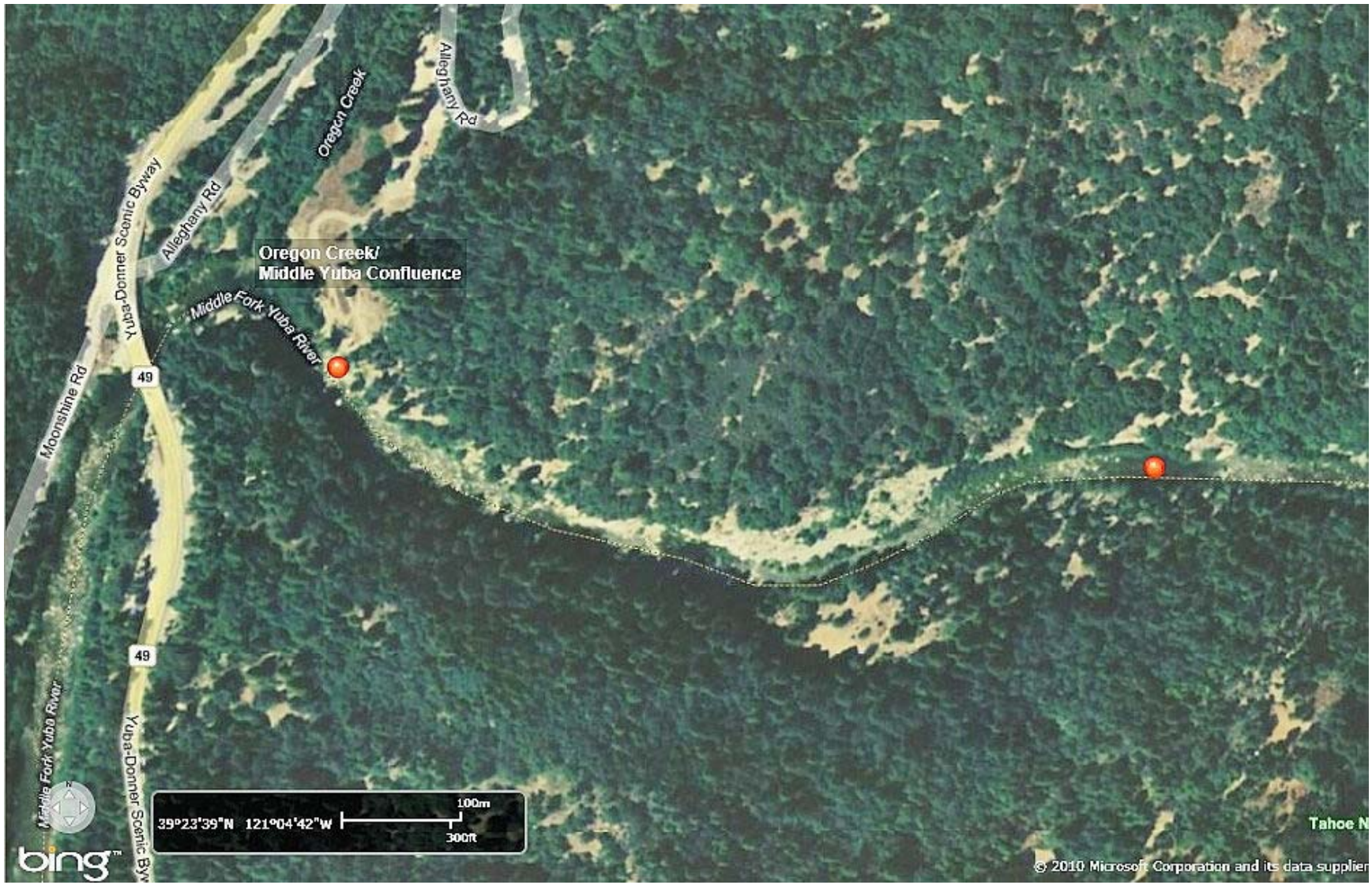
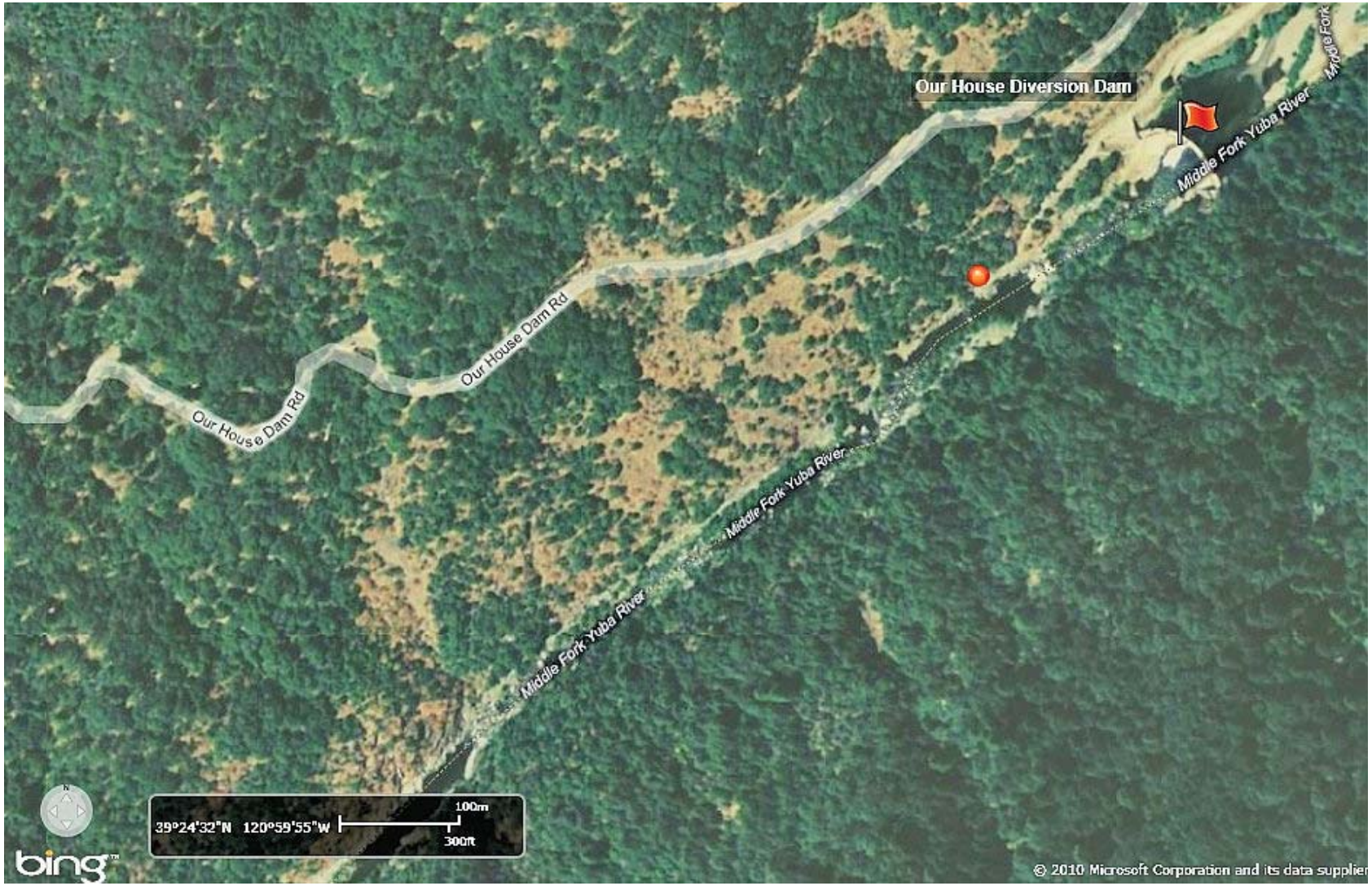


Figure 1.0-5. Middle Yuba River – Our House Diversion Dam Reach: aerial image of upstream section investigated in March 2011. The approximate downstream extent of the March 2011 reconnaissance area is demarcated by a red dot (upper limit of extent is Our House Diversion Dam).



Aerial Video Captures: Middle Yuba River - Our House Diversion Dam Reach (OHDDR)

Figure 1.0-6. Middle Yuba River OHDDR – RM 4.8.

Figure 1.0-7. Middle Yuba River OHDDR – RM 4.9.

Figure 1.0-8. Middle Yuba River OHDDR – RM 5.0.

Figure 1.0-9. Middle Yuba River OHDDR – RM 5.3.

Figure 1.0-10. Middle Yuba River OHDDR – RM 6.0.

Figure 1.0-11. Middle Yuba River OHDDR – RM 6.7.

Figure 1.0-12. Middle Yuba River OHDDR – RM 7.5.

Figure 1.0-13. Middle Yuba River OHDDR – RM 8.6.

Figure 1.0-14. Middle Yuba River OHDDR – RM 10.0.

Figure 1.0-15. Middle Yuba River OHDDR – RM 11.0.

Figure 1.0-16. Middle Yuba River OHDDR – RM 11.2.

Figure 1.0-17. Middle Yuba River OHDDR – RM 11.8.

Ground Photos: Middle Yuba River - Our House Diversion Dam Reach (OHDDR)

Figure 1.0-18. Middle Yuba River OHDDR, at RM 4.8, looking upstream at mid-channel pool boulder-dominant substrate, September 13, 2009.

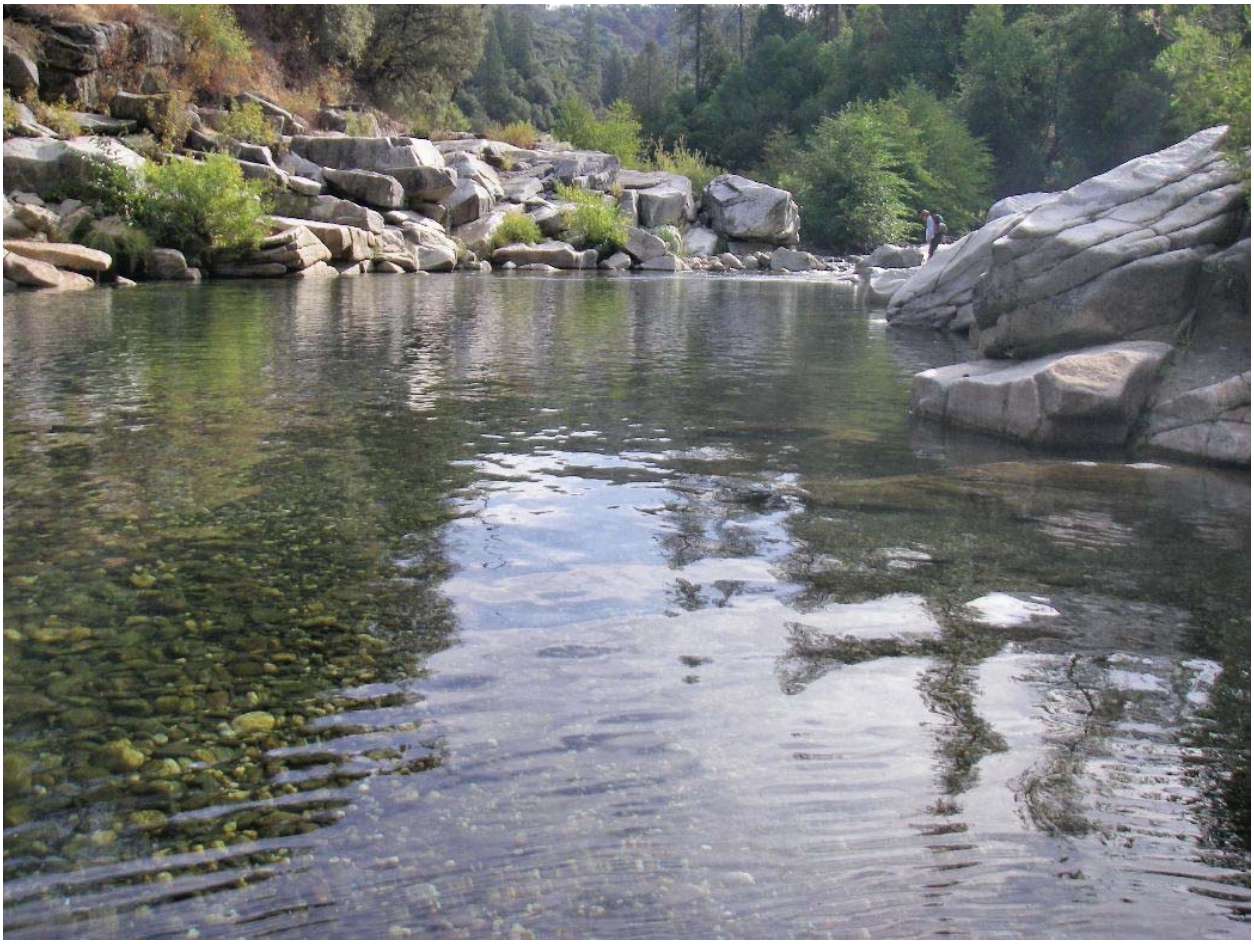


Figure 1.0-19. Middle Yuba River OHDDR, near RM 4.8, looking downstream, March 9, 2011.

Figure 1.0-20. Middle Yuba River OHDDR, at RM 4.9, looking upstream at low-gradient riffle, September 13, 2009.

Figure 1.0-21. Middle Yuba River OHDDR, at RM 4.9, looking upstream, March 9, 2011.

Figure 1.0-22. Middle Yuba River OHDDR, at RM 5.0, looking upstream at run with boulder substrate, September 13, 2009.

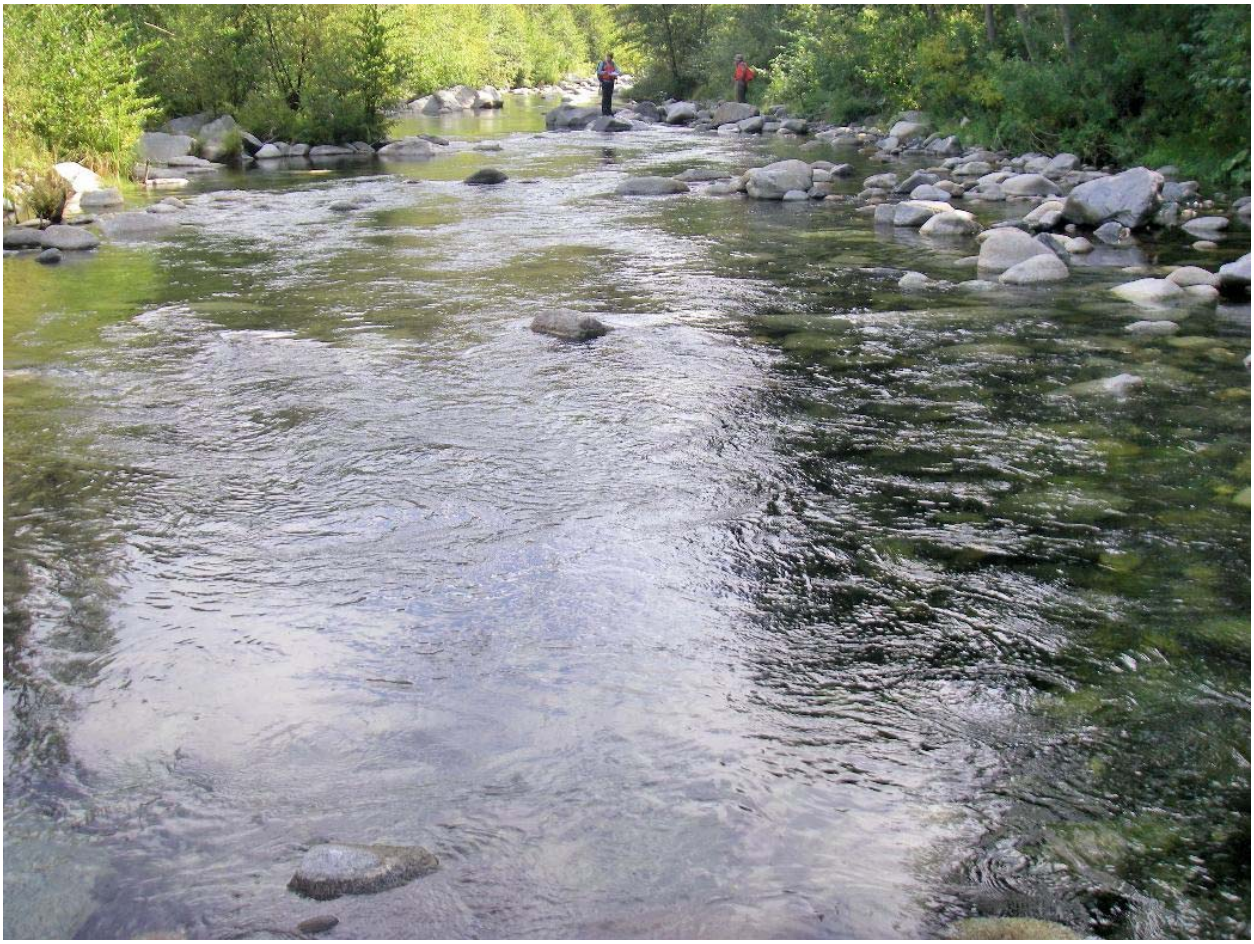


Figure 1.0-23. Middle Yuba River OHDDR, at RM 5.0, looking downstream at run with boulder substrate, March 11, 2011.

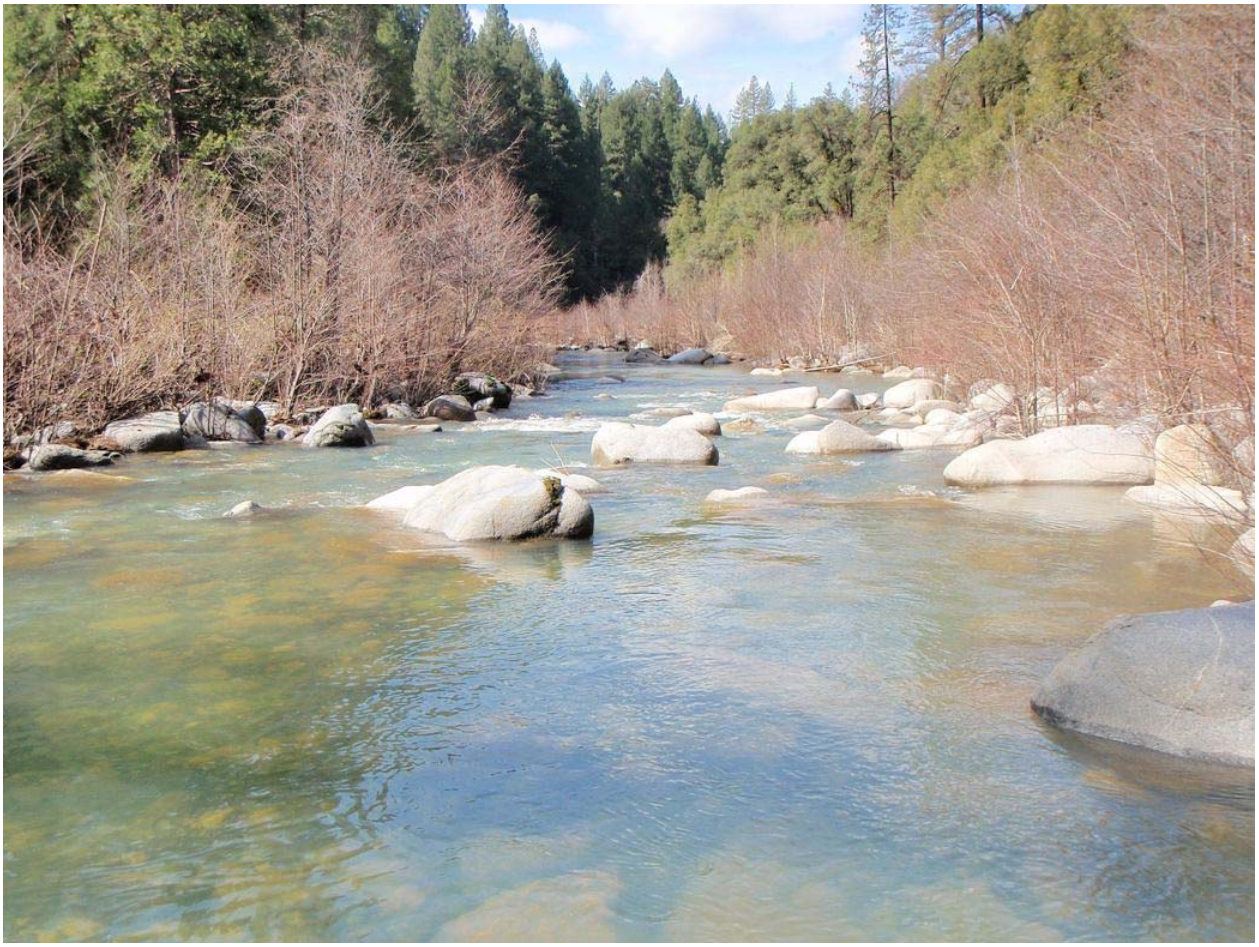


Figure 1.0-24. Middle Yuba River OHDDR, at RM 5.3, looking upstream at mid-channel pool, September 13, 2009.

Figure 1.0-25. Middle Yuba River OHDDR, at RM 11.8, looking upstream at mid-channel pool, September 16, 2009.

Figure 1.0-26. Middle Yuba River OHDDR, at RM 11.9, looking upstream at mid-channel pool, September 16, 2009.

Figure 1.0-27. Middle Yuba River OHDDR, at RM 11.9, looking upstream, March 10, 2011.

Figure 1.0-28. Middle Yuba River – Oregon Creek Reach: overview topography. The approximate extent of the March 2011 reconnaissance areas are demarcated by red dots (two short sections).

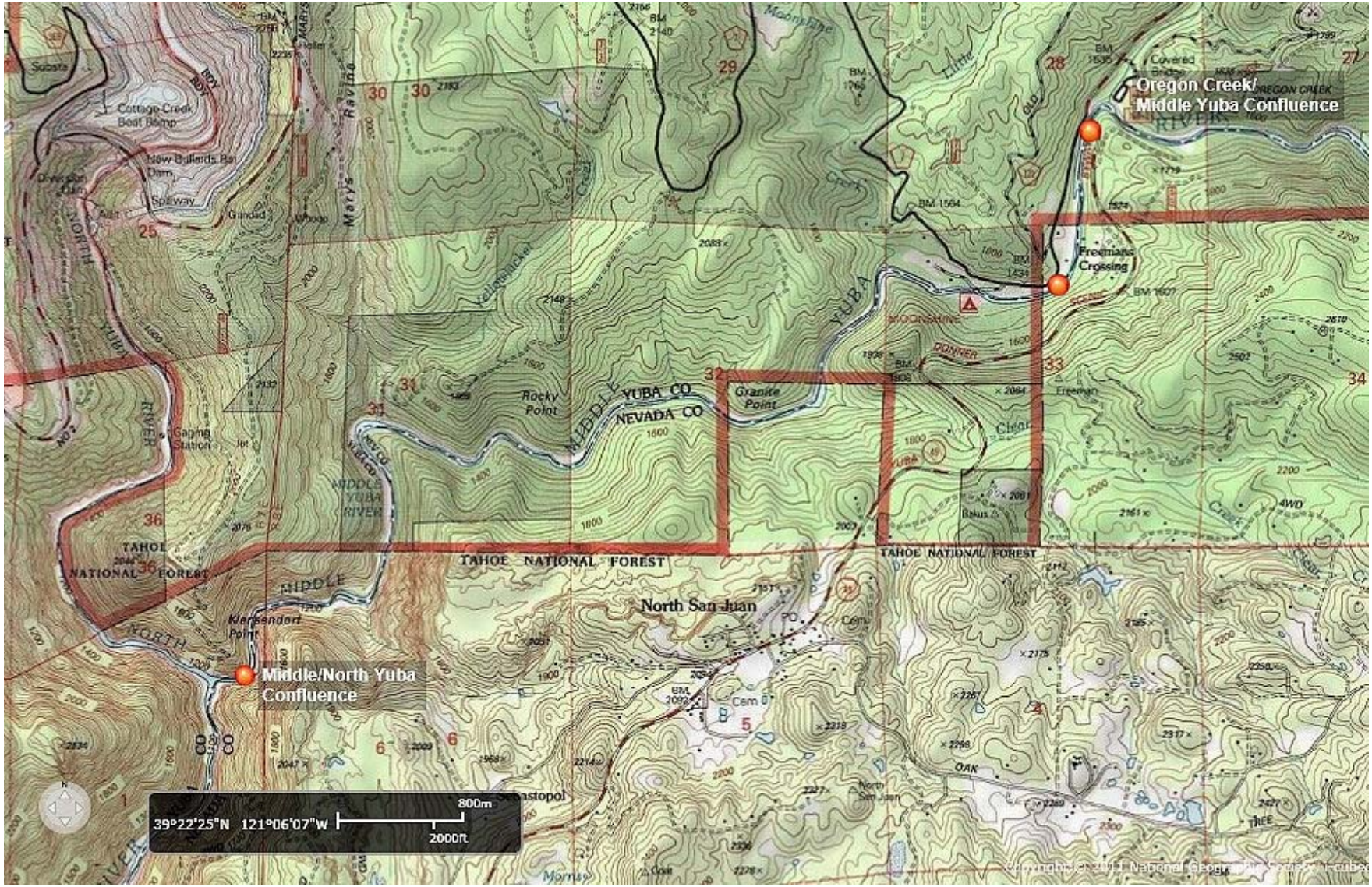


Figure 29. Middle Yuba River – Oregon Creek Reach: overview aerial image. The approximate extent of the March 2011 reconnaissance areas are demarcated by red dots (two short sections). Concentric red circles indicate approximate extent of inaccessible middle section of reach (private property access issues or not traversible during low flows or with boat).

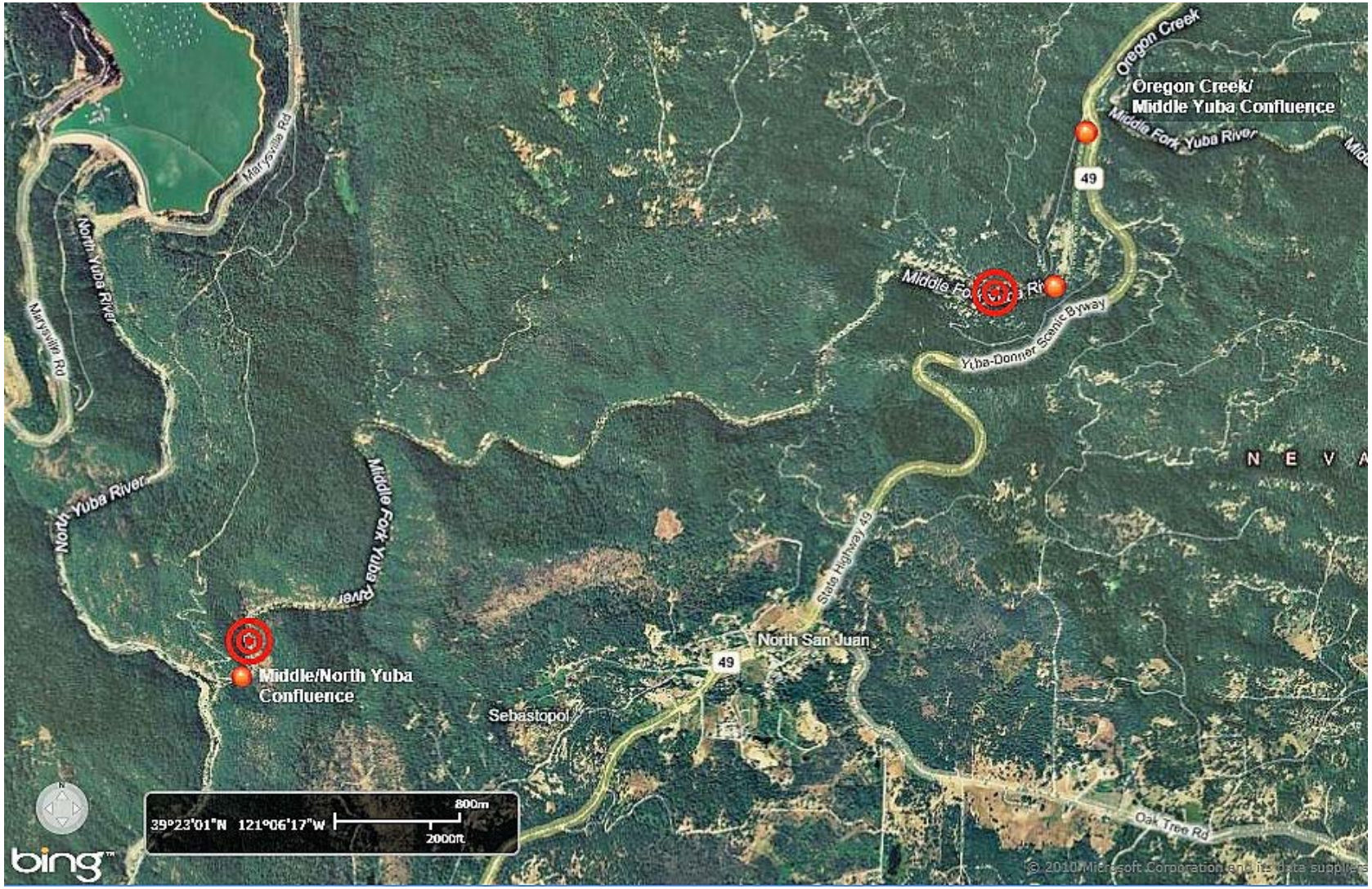


Figure 1.0-30. Middle Yuba River – Oregon Creek Reach: aerial image of downstream section investigated in March 2011. The approximate extent of the March 2011 reconnaissance area is demarcated by red dots. Concentric red circles indicate approximate upstream limit of accessible section of reach (impassible beyond this point during low flows).

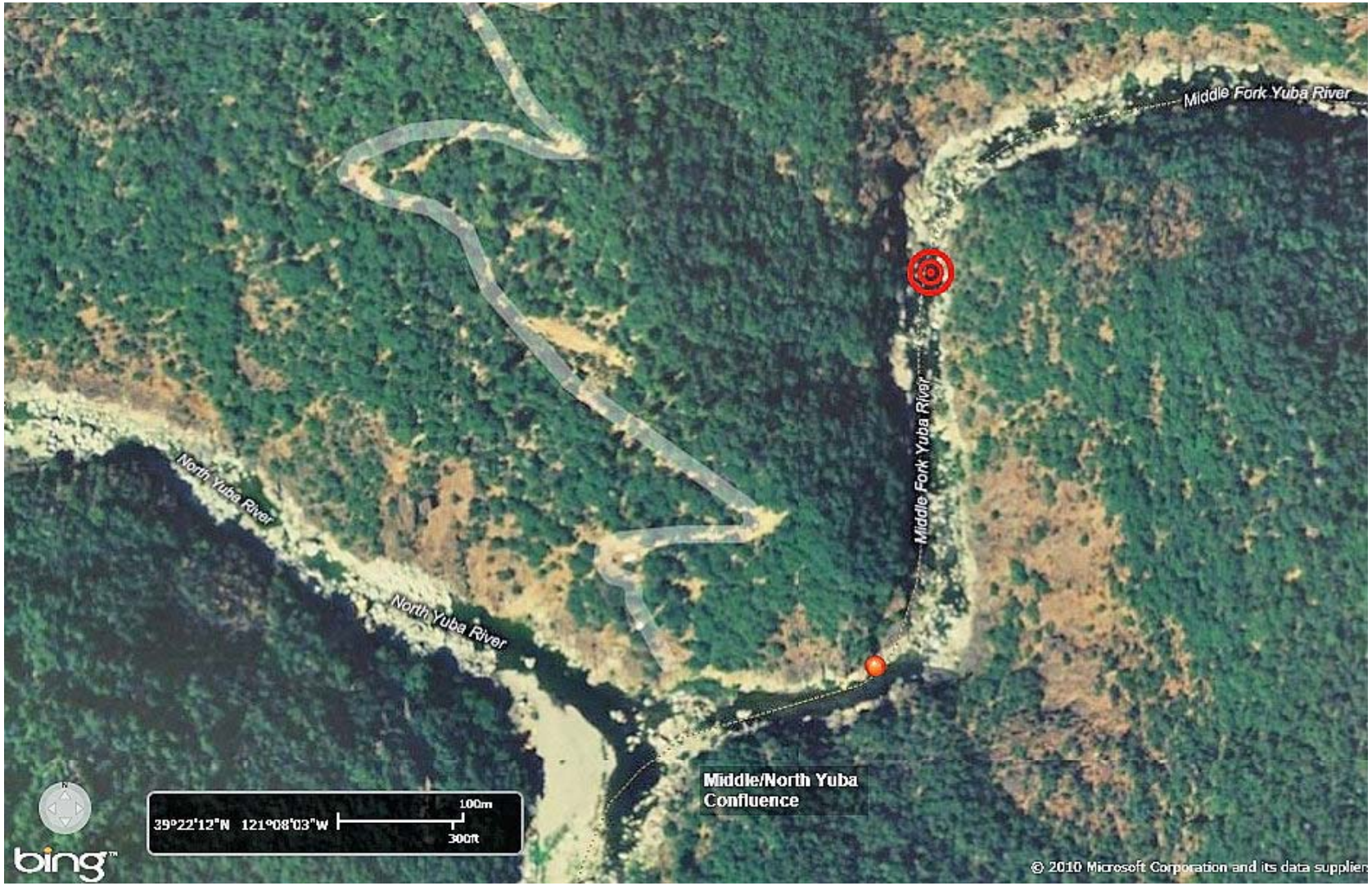
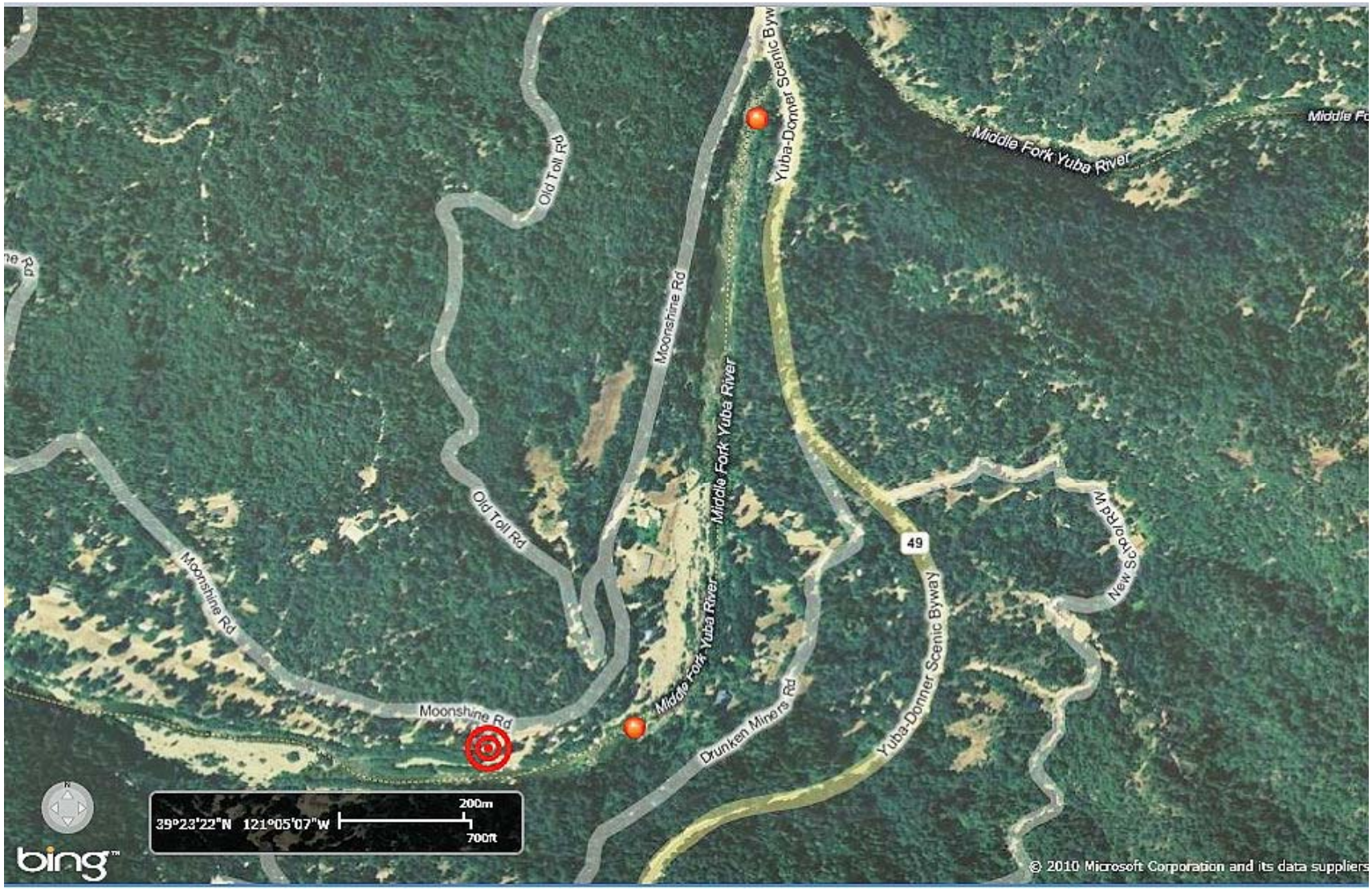


Figure 1.0-31. Middle Yuba River – Our House Diversion Dam Reach: aerial image of upstream section investigated in March 2011. The approximate extent of the March 2011 reconnaissance area is demarcated by red dots. Concentric red circle indicate approximate upstream limit of accessible section of reach (inacessible private property).



Aerial video captures: Middle Yuba River - Oregon Creek Reach (OCR)

Figure 1.0-32. Middle Yuba River OCR – RM 0.1.

Figure 1.0-33. Middle Yuba River OCR – RM 0.3.

Figure 1.0-34. Middle Yuba River OCR – RM 0.6.

Figure 1.0-35. Middle Yuba River OCR – RM 1.0.

Figure 36. Middle Yuba River OCR – RM 1.5.

Figure 1.0-37. Middle Yuba River OCR – RM 2.5.

Figure 1.0-38. Middle Yuba River OCR – RM 3.3.

Figure 1.0-39. Middle Yuba River OCR – RM 3.8.

Figure 1.0-40. Middle Yuba River OCR – RM 4.1.

Figure 1.0-41. Middle Yuba River OCR – RM 4.3.

Ground photos: Middle Yuba River - Oregon Creek Reach (OCR)

Figure 1.0-42. Middle Yuba River OCR, at RM 0.1, mid-channel pool just upstream of confluence with North Yuba River, looking upstream September 14, 2009.

Figure 1.0-43. Middle Yuba River OCR, at RM 0.1, mid-channel pool and high gradient riffle just upstream of confluence with North Yuba River, looking upstream March 9, 2011.

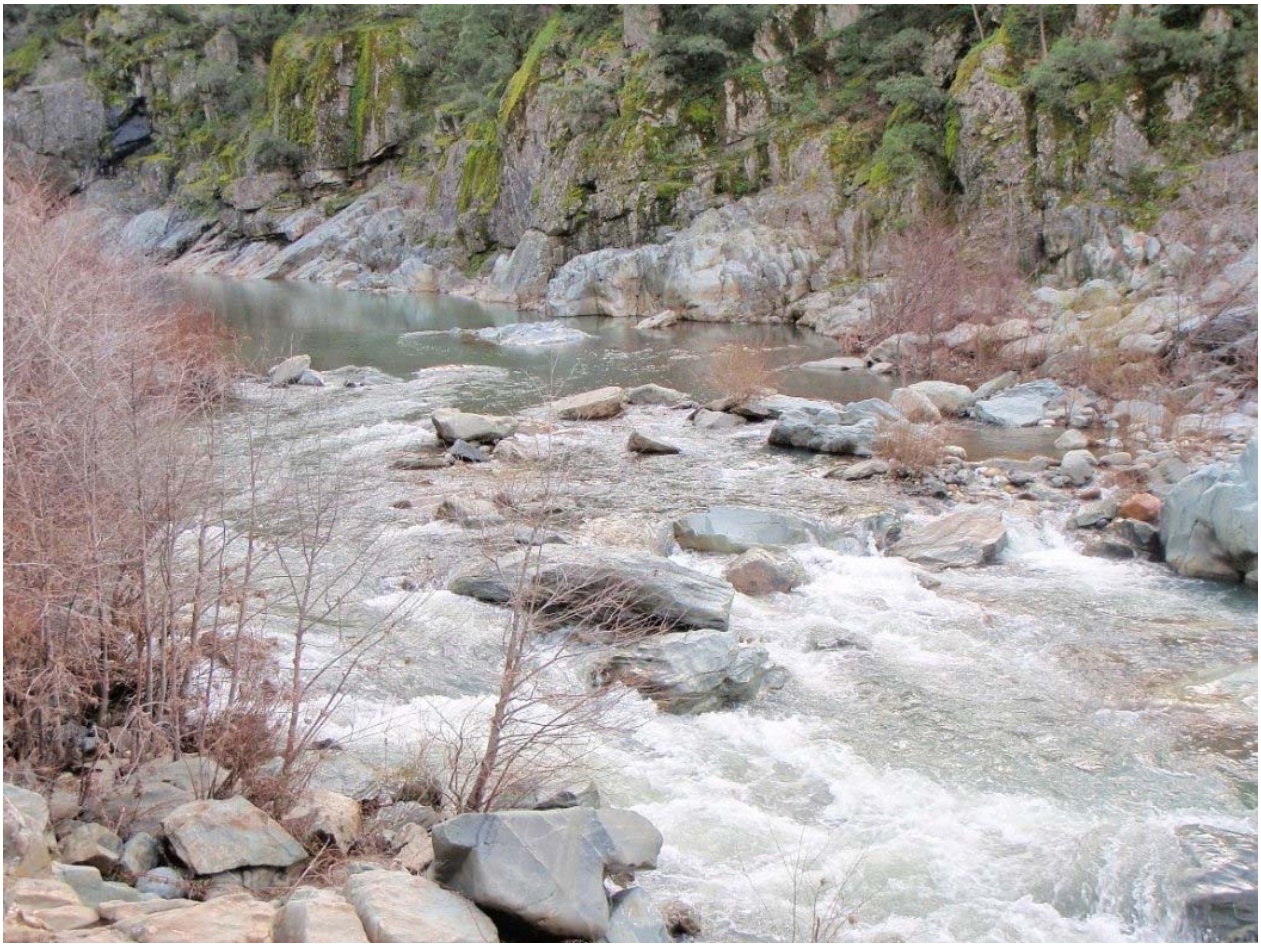


Figure 1.0-44. Middle Yuba River OCR, at RM 0.3 looking upstream at inaccessible higher-gradient section, September 14, 2009.

Figure 1.0-45. Middle Yuba River OCR, at RM 4.1, looking upstream at run with boulder-dominant substrate, September 16, 2009.

Figure 1.0-46. Middle Yuba River OCR, near RM 4.1, looking upstream, March 9, 2011.

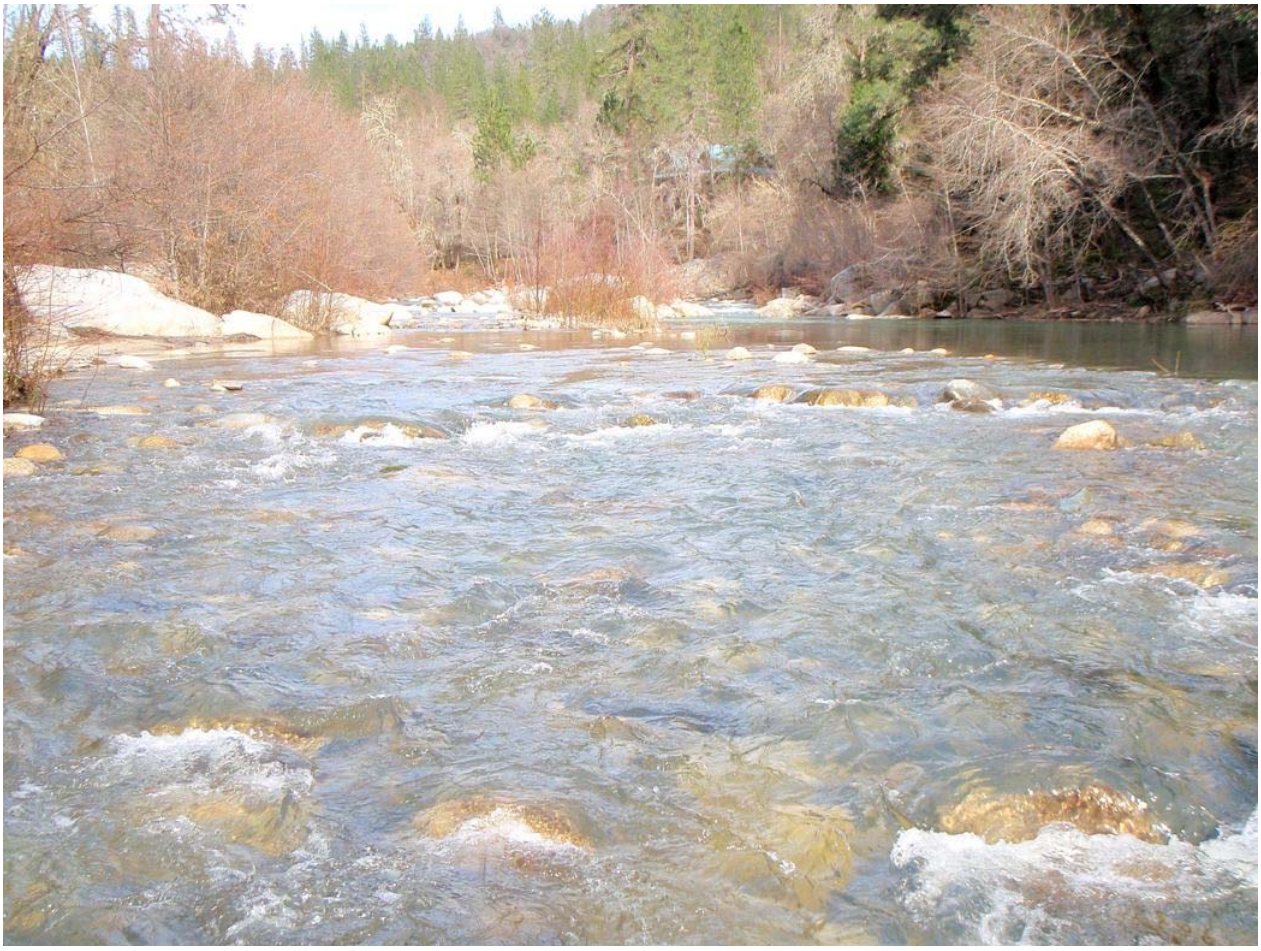


Figure 1.0-47. Middle Yuba River OCR, at RM 4.3, looking upstream at run with boulder-dominant substrate, September 16, 2009.

Figure 1.0-48. Middle Yuba River OCR, near RM 4.3, looking upstream at March 9, 2011.

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