

Lower Tuolumne River Instream Flow Study  
Transect Placement Field Summary  
Thursday-Friday, November 18-19, 2010

Participants:

Scott Wilcox (Stillwater)  
Russ Liebig (Stillwater)  
Ken Jarrett (Stillwater)

Allison Boucher (TRC)  
Zac Jackson (USFWS)  
Bob Hughes (CDFG)

The group met in Waterford on Thursday, November 18, for a tailgate session prior to heading out to the river. Scott Wilcox reviewed the site selection process and results of the October 5, 2010 office-based site selection workshop in Turlock, which included: 14 selected mesohabitat units; 3 extra units (intended for splitting of transects into multiple units where only one replicate was required); and 11 backup units. Russ Liebig reviewed the results of a reconnaissance survey of each habitat unit including: (1) general representativeness of habitat within the Lower Tuolumne River, (2) complexities that may limit modeling accuracy, and (3) physical accessibility. The reconnaissance survey of each habitat unit found that 13 of the 14 selected habitats were suitable for the study (i.e., representative, accessible, and modelable). The one selected unit that did not meet these criteria was restricted by limited access; however one backup unit had already been identified during the October 5 meeting as an appropriate alternative for that unit. In addition, two of the extra units and six of the backup units were found to be suitable in the event they were needed.

The Districts were able to secure vehicle access to each of the habitat units for transect placement, though complete access (e.g., both sides of the river) required to conduct the field study has not yet been obtained. The group visited each selected habitat unit for transect placement as well as suitable extra and backup units. During the process, the group eliminated one additional selected unit (Riffle #81) and included seven extra or backup units (including one added in the field [Run #83] not previously identified during the October 5 workshop).

At each habitat unit, agency representatives designated transect locations (or concurred with proposed transect locations suggested by Stillwater staff) sufficient to represent the hydraulic and habitat variability in the unit. A total of 40 transects were placed in 19 habitat units between River Mile 29.7 and 49.3.

Transect locations are described in Table 1 and shown in Attachment 1.

IFIM Transect Placement Field Summary

**Table 1. Tuolumne River Instream Flow Study Transect Location Documentation**

Channel Form	Unit Type	Unit & Transect Letter <sup>1</sup>	Tile Number <sup>2</sup>	Transect Characteristics	Location/Notes
Flatwater	Glide	24A	6	Deeper, slower	Approx. 110 ft upstream of riffle break at Unit 25
Flatwater	Glide	24B	6	Faster, shallower	Approx. 45 ft upstream of riffle break at Unit 25
Bar Complex	Riffle	25A	6	Faster, steeper	Approx. 100 ft from the top of bar complex
Bar Complex	Riffle	25B	6	Slower, flatter	Top of point bar on RR <sup>3</sup> ; Approx. 100 ft downstream of mid-channel island on RL
Bar Complex	Run	26A	6	Head of run, more turbulent	Point bar on RR, approx. 50-75 ft downstream of Riffle 25
Bar Complex	Run	26B	6	Mid-run, less turbulent	Point bar on RR, large oak on RL, approx. 150 ft upstream of Riffle 27
Flatwater	Run	28A	7	More turbulent, faster, deeper	Approx. 100 ft downstream of Riffle 27; opening in the brush on RR
Flatwater	Run	28B	7	Flatter, less turbulent	Approx. 100 ft downstream of transect 28A
Flatwater	Glide	29A	7	Mid-glide, uniform	Supplements transects in selected glide 24
Flatwater	Riffle	30A	7	More varied hydraulic conditions	Approx. 50 ft from the top of unit; point bar on RR, over large woody debris on RL
Flatwater	Riffle	30B	7	More uniform conditions, faster	Approx. 40 ft downstream of RR bar
Flatwater	Run	82A	16		Off RR point just downstream of turn out of Riffle; complex flow and cover on RL
Flatwater	Run	82B	16		Downstream side of island with backwater on RR, between trees on RL
Flatwater	Run	82C	16	Faster, more cobble, than transects A & B	Off top of point bar on RR
Bar Complex	Run	83A	16	Narrow, fast	Backup provisional unit in case downstream selected Runs are less suitable. Subsequently decided to sample all of them because of different conditions in Run 83
Bar Complex	Run	83B	16	Flatter, more laminar	Downstream of 83A approx. 100 ft
Flatwater	Run	84A	16/17	Faster portion of the run	Near fence gate at "boat launch" location

<sup>1</sup> Unit numbers from Tuolumne River Mapbook – IFIM Mesohabitats, 2010. Transects lettered from upstream to downstream within a unit.

<sup>2</sup> Tuolumne River Mapbook – IFIM Mesohabitats, 2010

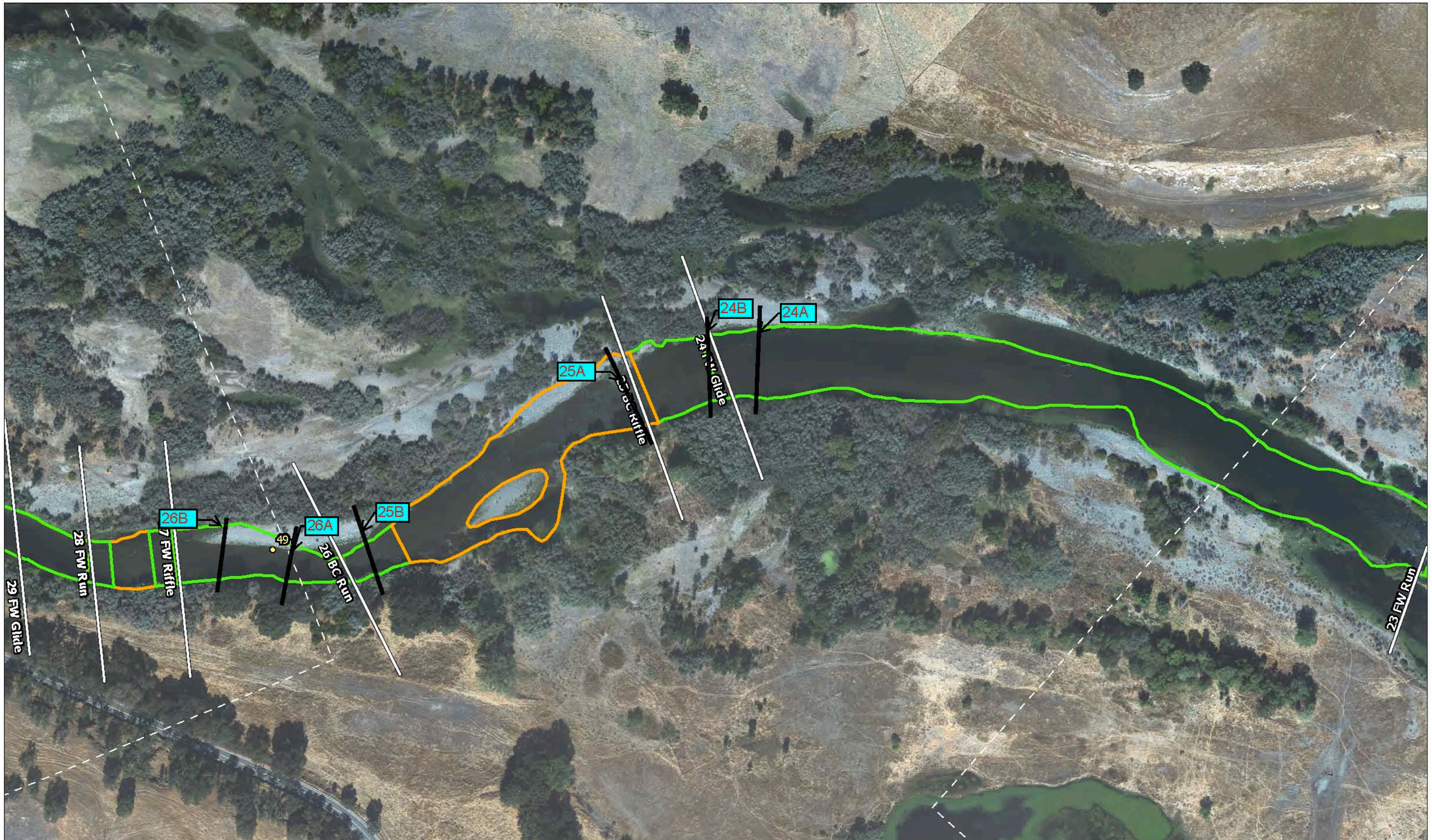
<sup>3</sup> RR (river right) and RL (river left), defined as looking downstream

IFIM Transect Placement Field Summary

Channel Form	Unit Type	Unit & Transect Letter <sup>1</sup>	Tile Number <sup>2</sup>	Transect Characteristics	Location/Notes
Flatwater	Run	84B	16/17	Flatter, slower portion of run	At valley oak RR, bedrock edge face RL
Flatwater	Run	84C	16/17	Pool-like portion, low velocity	Approx. 200 ft downstream of 84B
Bar Complex	Run	85A	17	Fast, shallow	Sample as extra run cross section due to cobble substrate; off of bar on RR
Flatwater	Pool	86A	17	Some higher velocity	Head of very large pool near corral
Flatwater	Pool	86B	17	Slow velocity in middle of pool	At gate access approx. 500 ft downstream of 86A; all middle of pool is approx. the same
Flatwater	Pool	86C	17	Shallower tail at bottom of pool	Marshy bar on RL; 350-400 ft downstream of picnic bench area on RL
Bar Complex	Pool	155A	31	Swifter section	Extra pool; transect at head
Bar Complex	Pool	155B	31	Shallow, slow	Extra pool; at tail; will get the mid pool conditions at downstream pools
Bar Complex	Riffle	156A	32	Across island at the top of the riffle	Would be good to add if units 160 & 162 don't work as bar complex riffles. The group subsequently decided to add unit 156 & only put 1 transect in unit 162.
Bar Complex	Riffle	156B	32	Between islands in middle of the riffle	
Bar Complex	Riffle	160A	33	At head with faster thalweg	Approx. 40 ft downstream of gravel conveyor
Bar Complex	Riffle	160B	33	Near tail in more uniform cross section	Approx. 100 ft downstream of 160A
Bar Complex	Run	161A	33	Head of run is faster	Open on RR bank
Bar Complex	Run	161B	33	Flatter, more uniform; slower at tail of run	
Bar Complex	Riffle	162A	33	Wide, shallow cross section	Above a transverse flow split & the backwater, at the downstream end of the left bank bar. Use Riffle 156 for two additional transects
Bar Complex	Pool	163A	33	Faster outflow from riffle	Head of Pool
Bar Complex	Pool	163B	33	Mid Pool same as for 163A	Left bank end pin crosses 163C due to angle of the river at the bend

IFIM Transect Placement Field Summary

Channel Form	Unit Type	Unit & Transect Letter <sup>1</sup>	Tile Number <sup>2</sup>	Transect Characteristics	Location/Notes
Bar Complex	Pool	163C	33	Shallower tail	Approx. 100 ft downstream of 163B tail; Right bank is directly below oak , then is first oak upstream of ravine on right bank. All pool cross sections are very wide (>300 ft )
Bar Complex	Glide	205A	42	Upstream end of glide	30 ft upstream of greenbelt bench at base of valley oak; work from left bank. Next to Waterford gated subdivision on RR.
Bar Complex	Glide	205B	42	Downstream end of glide, similar habitat	Above large woody debris on right bank; 1 tree downstream of 205A, at black walnut
Flatwater	Pool	225A	46	Upstream end	Cross section is at divider between upstream run; Right bank is open cobble bar
Flatwater	Pool	225B	46	Slow, deep, wide cross section	Approx. 200 ft downstream of 225A, in middle of unit; left bank campfire is near cross section, and open grassy area is on right bank
Flatwater	Pool	225C	46	Narrower tail	Approx. 200 ft from downstream end of unit. Thick brush on both sides.



Tuolumne River - IFIM Mesohabitats, 2010



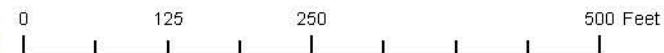
- BCE Runs █
- BCE Riffles █
- BCE Pools █
- Meso Habitat reach
- BC = Bar Complex
- FW = Flatwater
- Tile Boundary (shown white on the map)
- River Miles ●
- Side channel (ID labeled) ●●●●

METADATA  
 Tiles 29 to 47: NAIP, 6/29/2009 (130 cfs)  
 Tiles 1 to 29: Sanborn Imagery, 09/25/2005 (335 cfs)  
 Wetted perimeter were first based on EA\_mapping data (90's) at 230 cfs,  
 and later refined using 2005 & 2009 NAIP and field measurements from  
 2008 and 2009 surveys to adjust for channel migration.

**Tile 06**



Tuolumne River - IFIM Mesohabitats, 2010

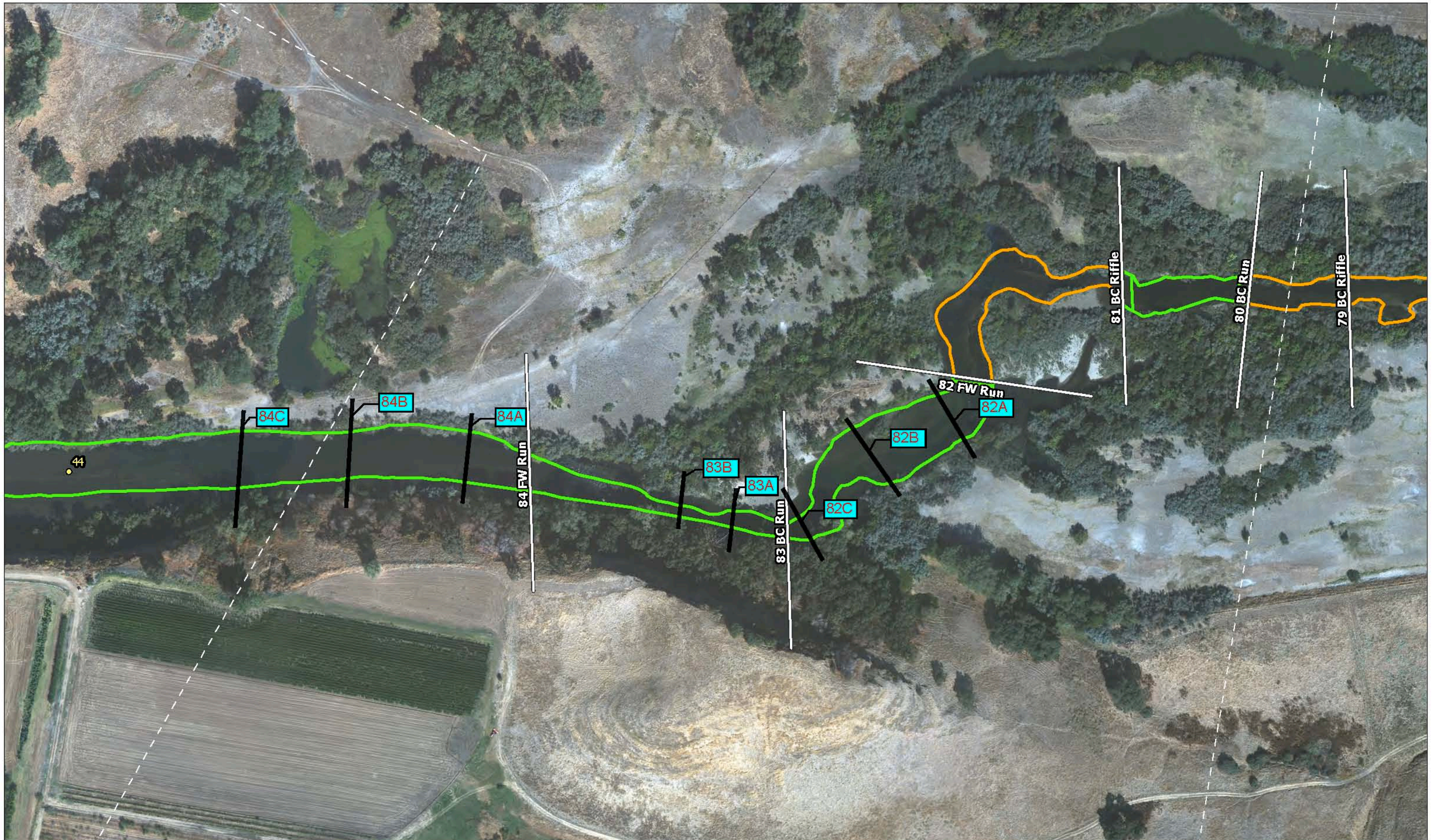


- BCE Runs █
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Tile 07



Tuolumne River - IFIM Mesohabitats, 2010



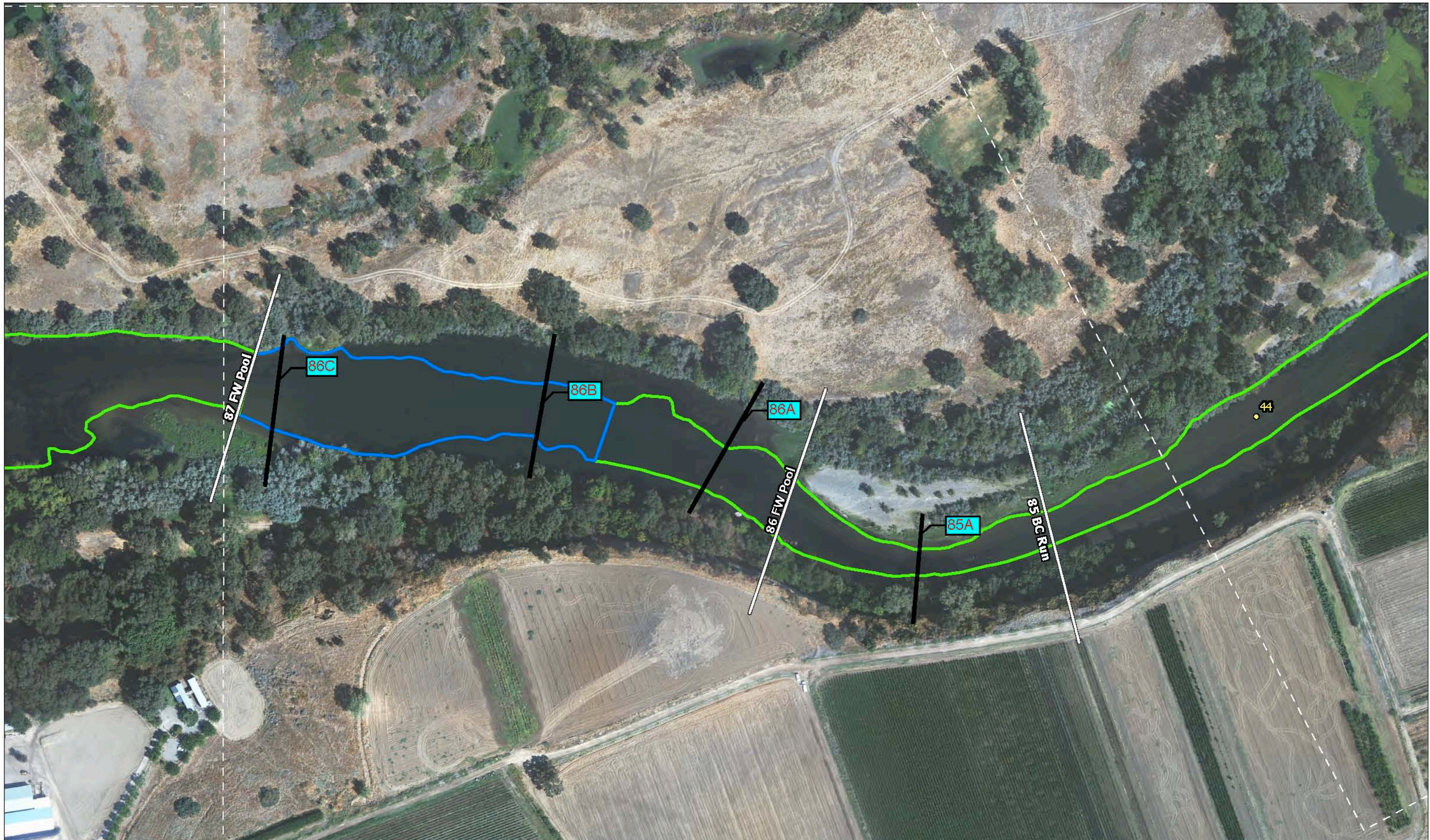
- BCE Runs █
- BCE Riffles █
- BCE Pools █

- Meso Habitat reach
- BC = Bar Complex
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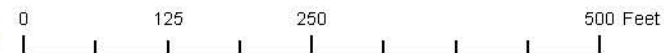
- Tile Boundary (shown white on the map)
- River Miles
- Side channel (ID labeled)

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**Tile 16**



Tuolumne River - IFIM Mesohabitats, 2010



- BCE Runs █
- BCE Riffles █
- BCE Pools █

- Meso Habitat reach
- BC = Bar Complex
- FW = Flatwater

- Tile Boundary (shown white on the map)
- River Miles
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**Tile 17**





Tuolumne River - IFIM Mesohabitats, 2010



- BCE Runs □
- BCE Riffles □
- BCE Pools □

- Meso Habitat reach
- BC = Bar Complex
- FW = Flatwater

- Tile Boundary (shown white on the map)
- River Miles
- Side channel (ID labeled)

METADATA  
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Tuolumne River - IFIM Mesohabitats, 2010



- BCE Runs █
- BCE Riffles █
- BCE Pools █

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- BC = Bar Complex
- FW = Flatwater

- Tile Boundary (shown white on the map)
- River Miles
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Tile 32



Tuolumne River - IFIM Mesohabitats, 2010



- BCE Runs □
- BCE Riffles □
- BCE Pools □

- // Meso Habitat reach
- BC = Bar Complex
- FW = Flatwater

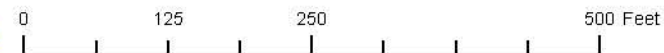
- Tile Boundary (shown white on the map)
- River Miles
- Side channel (ID labeled)

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Tile 33



Tuolumne River - IFIM Mesohabitats, 2010



- BCE Runs █
- BCE Riffles █
- BCE Pools █

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- BC = Bar Complex
- FW = Flatwater

- Tile Boundary (shown white on the map)
- River Miles
- Side channel (ID labeled)

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Tile 42



Tuolumne River - IFIM Mesohabitats, 2010



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- BCE Riffles █
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**Tile 46**