

**Table H-1. Presence / Absence of *Didymosphenia geminata*.**

Instream Flow Study Reaches / Sites		Presence/Absence	Supplemental Lab Samples <sup>1</sup>	Comments <sup>2</sup>
Duncan Creek				
Duncan Creek below Diversion	D6.3	Present	Present	Dominant, microscope photo taken
North Fork Long Canyon Creek				
North Fork Long Canyon Creek below Diversion	NFLC1.9	Absent	NA	
South Fork Long Canyon Creek				
South Fork Long Canyon Creek above Diversion	SFLC4.2	Present	NA	Rare
South Fork Long Canyon Creek below Diversion	SFLC2.3	Absent	NA	
Long Canyon Creek				
Long Canyon Creek below North and South Fork Long Canyon Creek	LC9.0	Present	NA	Rare
Middle Fork American River Upstream of Middle Fork Interbay				
Middle Fork American River below French Meadows Reservoir	MF44.7	Present	Present	Dominant, microscope photo taken
Middle Fork American River Immediately above Middle Fork Interbay	MF36.2	Present	NA	Rare
Middle Fork American River from Middle Fork Interbay to Ralston Afterbay				
Middle Fork American River between Middle Fork Interbay and Ralston Afterbay	MF26.2	Present	NA	Dominant
Middle Fork American River Downstream of Ralston Afterbay				
Middle Fork American River below Ralston Afterbay at Horseshoe Bar	MF23.5	Present	NA	Dominant
Middle Fork American River below Ralston Afterbay	MF14.1	Present	Present	Abundant
Middle Fork American River above North Fork American River confluence	MF4.8	Present	Present	Dominant
Rubicon River				
Rubicon River below Hell Hole Reservoir	R25.7	Present	Present	Abundant
Rubicon River Near Ellicott Bridge	R20.9	Present	Absent; masses of <i>Cymbella</i> sp. present	Abundant
Rubicon River Near Ralston Afterbay	R3.5	Absent	NA	
Other Tributaries				
North Fork American River	NF31.3	Absent	NA	

<sup>1</sup>At some sites additional algae samples were also collected and sent to Sarah Spaulding's Lab for identification.

<sup>2</sup>Rare = only one cell/fragment in scan, Abundant = >25 cells per field-of-view, Dominant= too numerous to count

Table H-2. Summary Results From Algae Abundance Surveys.

Instream Flow Study Reaches / Sites	Site ID	Algae Coverage			Substrate Type	Percent of Substrate Available for Algae Attachment <sup>3</sup>
		Macro <sup>1</sup>	Micro <sup>2</sup>	None		
<b>Duncan Creek</b>						
Duncan Creek below Diversion	D6.3	68.7%	12.9%	18.4%	boulder/cobble/gravel	90.6%
<b>North Fork Long Canyon Creek</b>						
North Fork Long Canyon Creek below Diversion	NFLC1.9	5.0%	20.4%	74.6%	boulder/cobble/gravel/sand	76.1%
<b>South Fork Long Canyon Creek</b>						
South Fork Long Canyon Creek below Diversion	SFLC2.3	24.0%	14.5%	61.5%	boulder/cobble/gravel/sand	88.9%
<b>Long Canyon Creek</b>						
Long Canyon Creek below North and South Fork Long Canyon Creek	LC9.0	2.3%	68.3%	29.5%	boulder/cobble/gravel	83.9%
<b>Middle Fork American River Upstream of Middle Fork Interbay</b>						
Middle Fork American River below French Meadows Reservoir	MF44.7	51.2%	0.0%	48.8%	bedrock/boulder/gravel	100.0%
Middle Fork American River Immediately above Middle Fork Interbay	MF36.2	10.9%	6.8%	82.3%	boulder/cobble/gravel	100.0%
<b>Middle Fork American River from Middle Fork Interbay to Ralston Afterbay</b>						
Middle Fork American River between Middle Fork Interbay and Ralston Afterbay	MF26.2	21.3%	12.7%	66.0%	boulder/cobble/gravel	97.8%
<b>Middle Fork American River Downstream of Ralston Afterbay</b>						
Middle Fork American River below Ralston Afterbay (Horseshoe Bar)	MF23.5	79.6%	5.9%	14.5%	boulder/cobble	100.0%
Middle Fork American River below Ralston Afterbay	MF14.1	37.4%	5.9%	56.7%	cobble/gravel/sand	83.4%
Middle Fork American River above North Fork American River confluence	MF4.8	47.8%	12.7%	39.5%	boulder/cobble/gravel	97.8%
<b>Rubicon River</b>						
Rubicon River below Hell Hole Reservoir	R25.7	69.4%	7.3%	23.4%	boulder/cobble/sand	76.7%
Rubicon River Near Ellicott Bridge	R20.9	7.5%	3.2%	89.3%	boulder/cobble/gravel	100.0%
Rubicon River Near Ralston Afterbay	R3.5	16.1%	17.2%	66.7%	boulder/cobble	100.0%
<b>Other Tributaries</b>						
North Fork American River	NF31.3	31.5%	10.9%	57.6%	cobble/gravel	100.0%

<sup>1</sup>Macroalgae is visible without magnification, i.e. filamentous algae.<sup>2</sup>Microalgae, typically diatoms or blue-green algae, is only visible with magnification.<sup>3</sup>Substrates >0.8 inches in diameter (within the small gravel category in the MFP substrate code) are available for attachment (Barbour et al. 1999).

Table H-3. Detailed Results From Algae Abundance Surveys.

Duncan Creek

<b>D6.3</b>				
Location on Transect	Algae Type <sup>1</sup>	Coverage <sup>2</sup>	Substrate	Percent of Substrate Available for Algae Attachment <sup>3</sup>
<b>Transect 1</b>				
River Left	macro	30	cobble	90
	micro	4		
River Center	macro	20	60 cobble/ 40 gravel	95
	micro	9		
River Right	macro	40	coarse gravel	90
	micro	6		
<b>Transect 2</b>				
River Left	macro	30	cobble	45
	micro	10		
River Center	macro	23	cobble	95
	micro	11		
River Right	macro	49	boulder	100
	micro	0		
<b>Transect 3</b>				
River Left	macro	49	60 cobble/ 40 gravel	100
	micro	0		
River Center	macro	13	boulder	100
	micro	17		
River Right	macro	49	cobble	100
	micro	0		

North Fork Long Canyon Creek

<b>NFLC 1.9</b>				
Location on Transect	Algae Type <sup>1</sup>	Coverage <sup>2</sup>	Substrate	Percent of Substrate Available for Algae Attachment <sup>3</sup>
<b>Transect 1</b>				
River Left	macro	0	sand/gravel/cobble	40
	micro	0		
River Center	macro	0	sand/gravel/cobble	80
	micro	14		
River Right	macro	0	med cobble	95
	micro	0		
<b>Transect 2</b>				
River Left	macro	0	cobble/sand	50
	micro	7		
River Center	macro	0	cobble/gravel	85
	micro	7		
River Right	macro	0	sml boulder/lrg cobble	100
	micro	7		
<b>Transect 3</b>				
River Left	macro	8	cobble/sml gravel	95
	micro	7		
River Center	macro	6	cobble/boulder	90
	micro	41		
River Right	macro	8	gravel	50
	micro	7		

Table H-3. Detailed Results From Algae Abundance Surveys (continued).

South Fork Long Canyon Creek

<b>SFLC 2.3</b>				
Location on Transect	Algae Type <sup>1</sup>	Coverage <sup>2</sup>	Substrate	Percent of Substrate Available for Algae Attachment <sup>3</sup>
<b>Transect 1</b>				
River Left	macro	19	cobble/gravel mix	85
	micro	5		
River Center	macro	0	boulder	100
	micro	25		
River Right	macro	2	gravels range	70
	micro	15		
<b>Transect 2</b>				
River Left	macro	25	cobble/gravel mix	95
	micro	4		
River Center	macro	28	sml boulder	100
	micro	4		
River Right	macro	4	lrg cobble	100
	micro	0		
<b>Transect 3</b>				
River Left	macro	0	sml boulder	100
	micro	4		
River Center	macro	18	cobble/gravel/sand mi	75
	micro	3		
River Right	macro	10	cobble/gravel/sand mi	75
	micro	4		

Long Canyon Creek

<b>LC9.0</b>				
Location on Transect	Algae Type <sup>1</sup>	Coverage <sup>2</sup>	Substrate	Percent of Substrate Available for Algae Attachment <sup>3</sup>
<b>Transect 1</b>				
River Left	macro	0	cobble	50
	micro	0		
River Center	macro	0	sml boulder	100
	micro	49		
River Right	macro	0	cobble	80
	micro	0		
<b>Transect 2</b>				
River Left	macro	0	large gravel	50
	micro	21		
River Center	macro	0	boulder	100
	micro	49		
River Right	macro	10	large cobble	100
	micro	49		
<b>Transect 3</b>				
River Left	macro	0	large gravel	75
	micro	35		
River Center	macro	0	boulder	100
	micro	49		
River Right	macro	0	boulder	100
	micro	49		

Table H-3. Detailed Results From Algae Abundance Surveys (continued).

## Middle Fork American River

<b>MF44.7</b>				
<b>Location on Transect</b>	<b>Algae Type<sup>1</sup></b>	<b>Coverage<sup>2</sup></b>	<b>Substrate</b>	<b>Percent of Substrate Available for Algae Attachment<sup>3</sup></b>
<b>Transect 1</b>				
River Left	macro	23	boulder	100
	micro	0		
River Center	macro	5	boulder	100
	micro	0		
River Right	macro	34	boulder	100
	micro	0		
<b>Transect 2</b>				
River Left	macro	45	lrg. gravel	100
	micro	0		
River Center	macro	15	gravel	100
	micro	0		
River Right	macro	28	gravel	100
	micro	0		
<b>Transect 3</b>				
River Left	macro	16	bedrock	100
	micro	0		
River Center	macro	36	bedrock	100
	micro	0		
River Right	macro	24	gravel	100
	micro	0		
<b>MF36.2</b>				
<b>Location on Transect</b>	<b>Algae Type<sup>1</sup></b>	<b>Coverage<sup>2</sup></b>	<b>Substrate</b>	<b>Percent of Substrate Available for Algae Attachment<sup>3</sup></b>
<b>Transect 1</b>				
River Left	macro	0	cobble	100
	micro	11		
River Center	macro	11	boulder/gravel	100
	micro	0		
River Right	macro	6	boulder/gravel	100
	micro	5		
<b>Transect 2</b>				
River Left	macro	10	UNK	100
	micro	0		
River Center	macro	0	boulder	100
	micro	3		
River Right	macro	8	boulder	100
	micro	6		
<b>Transect 3</b>				
River Left	macro	10	cobble	100
	micro	0		
River Center	macro	0	boulder	100
	micro	0		
River Right	macro	3	cobble	100
	micro	5		

Table H-3. Detailed Results From Algae Abundance Surveys (continued).

<b>MF26.2</b>				
<b>Location on Transect</b>	<b>Algae Type<sup>1</sup></b>	<b>Coverage<sup>2</sup></b>	<b>Substrate</b>	<b>Percent of Substrate Available for Algae Attachment<sup>3</sup></b>
<b>Transect 1</b>				
River Left	macro	0	gravel mix	90
	micro	5		
River Center	macro	18	boulder	100
	micro	0		
River Right	macro	0	boulder	100
	micro	0		
<b>Transect 2</b>				
River Left	macro	0	boulder	100
	micro	25		
River Center	macro	40	cobble	90
	micro	0		
River Right	macro	19	boulder	100
	micro	0		
<b>Transect 3</b>				
River Left	macro	0	boulder	100
	micro	26		
River Center	macro	11	cobble	100
	micro	0		
River Right	macro	6	boulder	100
	micro	0		
<b>MF23.5</b>				
<b>Location on Transect</b>	<b>Algae Type<sup>1</sup></b>	<b>Coverage<sup>2</sup></b>	<b>Substrate</b>	<b>Percent of Substrate Available for Algae Attachment<sup>3</sup></b>
<b>Transect 1</b>				
River Left	macro	40	cobble/boulder	100
	micro	6		
River Center	macro	21	cobble/boulder	100
	micro	20		
River Right	macro	45	cobble/boulder	100
	micro	0		
<b>Transect 2</b>				
River Left	macro	44	cobble/boulder	100
	micro	0		
River Center	macro	22	cobble/boulder	100
	micro	0		
River Right	macro	49		100
	micro	0		
<b>Transect 3</b>				
River Left	macro	49	cobble/boulder	100
	micro	0		
River Center	macro	49	cobble/boulder	100
	micro	0		
River Right	macro	32	cobble/boulder	100
	micro	0		

Table H-3. Detailed Results From Algae Abundance Surveys (continued).

<b>MF14.1</b>				
<b>Location on Transect</b>	<b>Algae Type<sup>1</sup></b>	<b>Coverage<sup>2</sup></b>	<b>Substrate</b>	<b>Percent of Substrate Available for Algae Attachment<sup>3</sup></b>
<b>Transect 1</b>				
River Left	macro	37	gravel	85
	micro	0		
River Center	macro	25	gravel	80
	micro	0		
River Right	macro	41	gravel	85
	micro	0		
<b>Transect 2</b>				
River Left	macro	0	gravel	85
	micro	21		
River Center	macro	3	gravel/sand	60
	micro	5		
River Right	macro	0	cobble/small gravel	76
	micro	0		
<b>Transect 3</b>				
River Left	macro	40	cobble	90
	micro	0		
River Right <sup>4</sup>	macro	10	cobble	100
	micro	0		
River Right	macro	9	cobble	90
	micro	0		
<b>MF4.8</b>				
<b>Location on Transect</b>	<b>Algae Type<sup>1</sup></b>	<b>Coverage<sup>2</sup></b>	<b>Substrate Type</b>	<b>Percent of Substrate Available for Algae Attachment<sup>3</sup></b>
<b>Transect 1</b>				
River Left	macro	39	cobble	100
	micro	0		
River Center	macro	0	boulder	100
	micro	49		
River Left <sup>4</sup>	macro	47	gravel/cobble	90
	micro	0		
<b>Transect 2</b>				
River Left	macro	19	cobble	100
	micro	0		
River Center	macro	32	cobble	100
	micro	7		
River Right	macro	49	cobble	100
	micro	0		
<b>Transect 3</b>				
River Left	macro	4	gravel/cobble	90
	micro	0		
River Center	macro	14	cobble	100
	micro	0		
River Right	macro	7	gravel/cobble	100
	micro	0		

Table H-3. Detailed Results From Algae Abundance Surveys (continued).

Rubicon River

<b>R25.7</b>				
<b>Location on Transect</b>	<b>Algae Type<sup>1</sup></b>	<b>Coverage<sup>2</sup></b>	<b>Substrate</b>	<b>Percent of Substrate Available for Algae Attachment<sup>3</sup></b>
<b>Transect 1</b>				
River Left	macro	18	boulder	100
	micro	5		
River Center	macro	45	boulder	100
	micro	0		
River Right	macro	40	boulder	100
	micro	10		
<b>Transect 2</b>				
River Left	macro	32	small cobble	30
	micro	0		
River Center	macro	14	small boulder	100
	micro	8		
River Right	macro	49	large cobble	100
	micro	0		
<b>Transect 3</b>				
River Left	macro	34	medium cobble	10
	micro	6		
River Center	macro	37	small cobble	80
	micro	3		
River Right	macro	37	bld, large cobble, sand	70
	micro	0		
<b>R20.9</b>				
<b>Location on Transect</b>	<b>Algae Type<sup>1</sup></b>	<b>Coverage<sup>2</sup></b>	<b>Substrate</b>	<b>Percent of Substrate Available for Algae Attachment<sup>3</sup></b>
<b>Transect 1</b>				
River Left	macro	2	bedrock/boulder	100
	micro	2		
River Center	macro	16	boulder	100
	micro	2		
River Right	macro	0	bedrock/cobble	100
	micro	4		
<b>Transect 2</b>				
River Left	macro	4	cobble/gravel	100
	micro	0		
River Center	macro	0	boulder/cobble	100
	micro	0		
River Right	macro	0	boulder/cobble	100
	micro	2		
<b>Transect 3</b>				
River Left	macro	11	boulder	100
	micro	0		
River Center	macro	0	cobble	100
	micro	4		
River Right	macro	0	cobble	100
	micro	0		



**Table H-3. Detailed Results From Algae Abundance Surveys (continued).**

<b>R3.5</b>				
<b>Location on Transect</b>	<b>Algae Type<sup>1</sup></b>	<b>Coverage<sup>2</sup></b>	<b>Substrate</b>	<b>Percent of Substrate Available for Algae Attachment<sup>3</sup></b>
<b>Transect 1</b>				
River Left	macro	0	cobble	100
	micro	22		
River Center	macro	11	boulder	100
	micro	0		
River Right	macro	5	cobble	100
	micro	0		
<b>Transect 2</b>				
River Left	macro	6	cobble	100
	micro	4		
River Center	macro	0	cobble	100
	micro	40		
River Right	macro	15	cobble	100
	micro	0		
<b>Transect 3</b>				
River Left	macro	4	cobble	100
	micro	0		
River Center	macro	23	boulder	100
	micro	4		
River Right	macro	7	cobble	100
	micro	6		

**North Fork American River**

<b>NF31.3</b>				
<b>Location on Transect</b>	<b>Algae Type<sup>1</sup></b>	<b>Coverage<sup>2</sup></b>	<b>Substrate</b>	<b>Percent of Substrate Available for Algae Attachment<sup>3</sup></b>
<b>Transect 1</b>				
River Left	macro	0	cobble	100
	micro	10		
River Center	macro	0	cobble	100
	micro	0		
River Right	macro	50	cobble	100
	micro	0		
<b>Transect 2</b>				
River Left	macro	16	cobble	100
	micro	8		
River Center	macro	0	cobble	100
	micro	12		
River Right	macro	12	cobble	100
	micro	15		
<b>Transect 3</b>				
River Left	macro	16	gravel/cobble mix	100
	micro	0		
River Center	macro	0	gravel/cobble mix	100
	micro	3		
River Right	macro	45	cobble	100
	micro	0		

<sup>1</sup>Macroalgae is visible without magnification, i.e. filamentous algae. Microalgae, typically diatoms or blue-green algae, is only visible with magnification.

<sup>2</sup>Coverage out of 49 possible delineated units from the field-based rapid periphyton survey protocol detailed in the Environmental Protection Agencies' Rapid Bioassessment Protocol For Use in Streams and Wadeable Rivers (Barbour et al. 1999).

<sup>3</sup>Substrates >0.8 inches in diameter (within the small gravel category in the MFP substrate code) are available for attachment (Barbour et al. 1999).

<sup>4</sup>Due to water velocity during time of survey one section could not be viewed. A duplicate measurement was taken on an accessible channel margin.