APPENDIX QU: Quivira Enhancement Reach

Dry Creek Habitat Enhancement Project

Effectiveness Monitoring Data

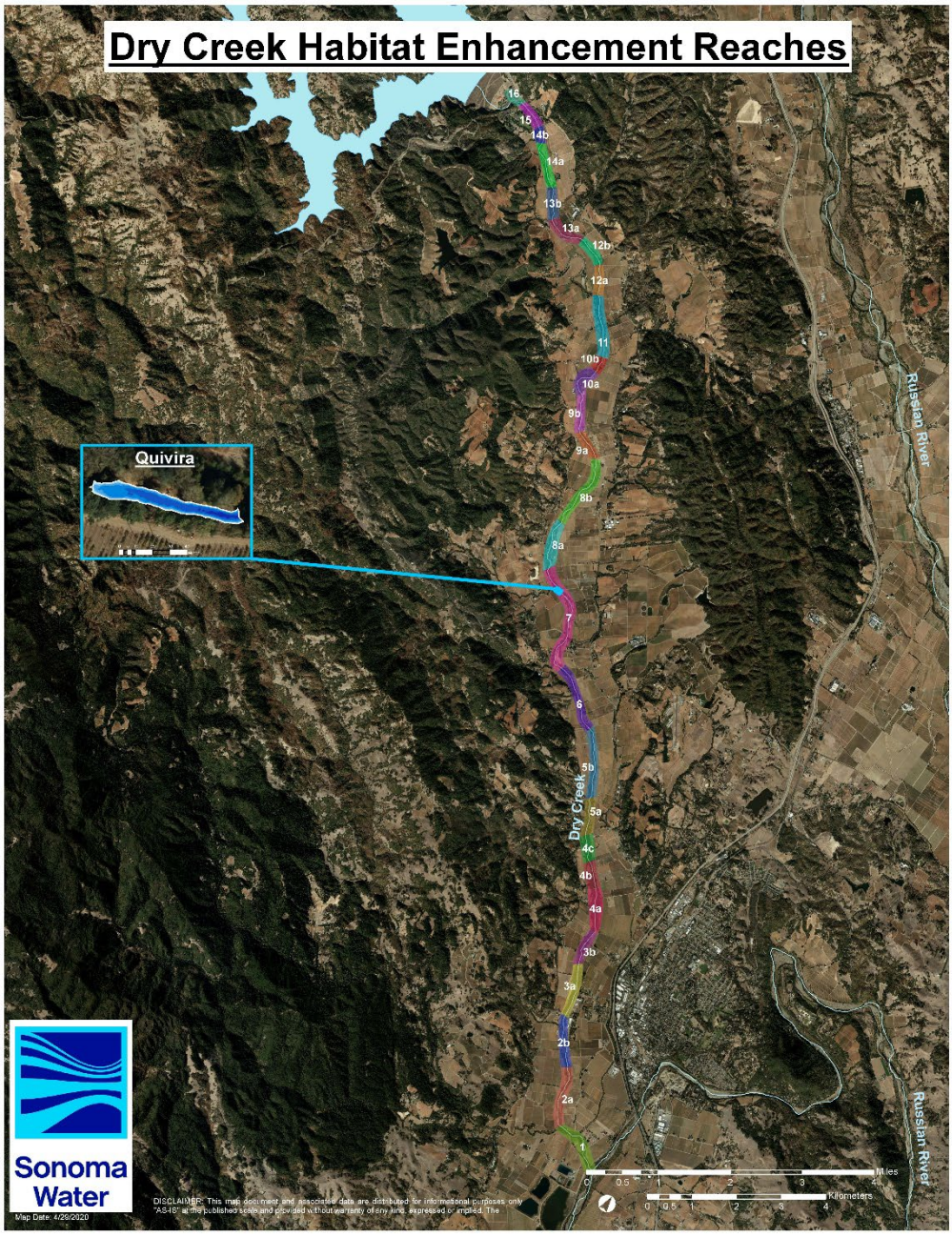

Table of Contents

TABLE OF CONTENTS **2**

LIST OF TABLES **3**

LIST OF FIGURES **4**

POST-EFFECTIVE FLOW, MARCH 2016 ..... **5**

DEPTH AND VELOCITY 6
HABITAT TYPES AND SHELTER VALUES 12
FEATURE, HABITAT UNIT, SITE, AND REACH RATINGS 15
FEATURE AND HABITAT UNIT CHECKLISTS 24

List of Tables

TABLE QU-1. AREAS AND PERCENTAGES OF: WETTED AREA, OPTIMAL DEPTH AND VELOCITY, AND OPTIMAL HYDRAULIC HABITAT WITHIN THE QUIVIRA ENHANCEMENT REACH, MARCH 2016. 6
TABLE QU-2. HABITAT, TYPES, SHELTER VALUE, PERCENT COVER, AND SHELTER SCORE FOR OFF CHANNEL HABITAT UNITS WITHIN THE QUIVIRA ENHANCEMENT REACH, MARCH 2016. 12
TABLE QU-3. POST-EFFECTIVE FLOW FEATURE RATINGS FOR THE QUIVIRA ENHANCEMENT REACH MARCH 2016..16
TABLE QU-4. POST-EFFECTIVE FLOW HABITAT UNIT RATINGS FOR THE QUIVIRA ENHANCEMENT REACH MARCH 2016. 19
TABLE QU-5. POST-EFFECTIVE FLOW AVERAGE FEATURE, AVERAGE HABITAT UNIT, SITE, AND REACH RATINGS FOR THE QUIVIRA ENHANCEMENT REACH, MARCH 2016. 21
TABLE QU-6. ADAPTIVE MANAGEMENT PLAN TARGETED CHECKLIST FOR THE QUIVIRA ENHANCEMENT REACH, MARCH 2016. 25
TABLE QU-7. ADAPTIVE MANAGEMENT PLAN FULL CHECKLIST FOR THE QUIVIRA ENHANCEMENT REACH, MARCH 2016. 26

List of Figures

FIGURE QU-1. MEASURED WATER DEPTH WITHIN THE QUIVIRA ENHANCEMENT REACH, MARCH 2016.....7
FIGURE QU-2. OPTIMAL WATER DEPTH FOR FRY (0.5-2.0 FT) AND PARR (2.0-4.0 FT) WITHIN THE QUIVIRA ENHANCEMENT REACH, MARCH 2016. 8
FIGURE QU-3. MEASURED WATER VELOCITY WITHIN THE QUIVIRA ENHANCEMENT REACH, MARCH 2016. 9
FIGURE QU-4. OPTIMAL WATER VELOCITY FOR FRY AND PARR (< 0.5 FT/S) WITHIN THE QUIVIRA ENHANCEMENT REACH, MARCH 2016. 10
FIGURE QU-5. OPTIMAL HYDRAULIC HABITAT FOR FRY (<0.5 FT/S, 0.5-2.0 FT) AND PARR (<0.5 FT/S, 2.0-4.0 FT) WITHIN THE QUIVIRA ENHANCEMENT REACH, MARCH 2016. 11
FIGURE QU-6. HABITAT UNIT NUMBER AND TYPE WITHIN THE QUIVIRA ENHANCEMENT REACH, MARCH 2016. 13
FIGURE QU-7. HABITAT UNIT SHELTER VALUES WITHIN THE QUIVIRA ENHANCEMENT REACH, MARCH 2016. 14
FIGURE QU-8. ENHANCEMENT SITES AND FEATURES WITHIN THE QUIVIRA ENHANCEMENT REACH, MARCH 2016. 17
FIGURE QU-9. FEATURE RATINGS FOR THE QUIVIRA ENHANCEMENT REACH, MARCH 2016. 18
FIGURE QU-10. HABITAT UNIT RATINGS FOR THE QUIVIRA ENHANCEMENT REACH, MARCH 2016. 20
FIGURE QU-11. POST-EFFECTIVE FLOW SITE RATINGS FOR THE QUIVIRA ENHANCEMENT REACH, MARCH 2016.....22
FIGURE QU-12. POST-EFFECTIVE FLOW REACH RATING FOR THE QUIVIRA ENHANCEMENT REACH, MARCH 2016. .23

Post-effective Flow, March 2016

Depth and Velocity

Table QU-1. Areas and percentages of wetted area, optimal depth and velocity, and optimal hydraulic habitat within the Quivira enhancement reach, March 2016.

Quivira Post-effective flow, March 2016	Wetted area (ft^2)	0.5 – 2.0 ft (ft^2)	2.0 – 4.0 ft (ft^2)	Total (ft^2)	< 0.5 ft/s (ft^2)	0.5 – 2.0 ft, < 0.5 ft/s (ft^2)	2.0 – 4.0 ft,< 0.5 ft/s (ft^2)	Total (ft^2)
Main channel alcove area	7,585	1,960	4,586	6,547	7,585	1,960	4,586	6,547
Total area	**7,585**	**1,960**	**4,586**	**6,547**	**7,585**	**1,960**	**4,586**	**6,547**
Main channel alcove % of wetted area	100%	26%	60%	86%	100%	26%	60%	86%
Total % of wetted area	**100%**	**26%**	**60%**	**86%**	**100%**	**26%**	**60%**	**86%**

Figure QU-1. Measured water depth within the Quivira enhancement reach, March 2016.

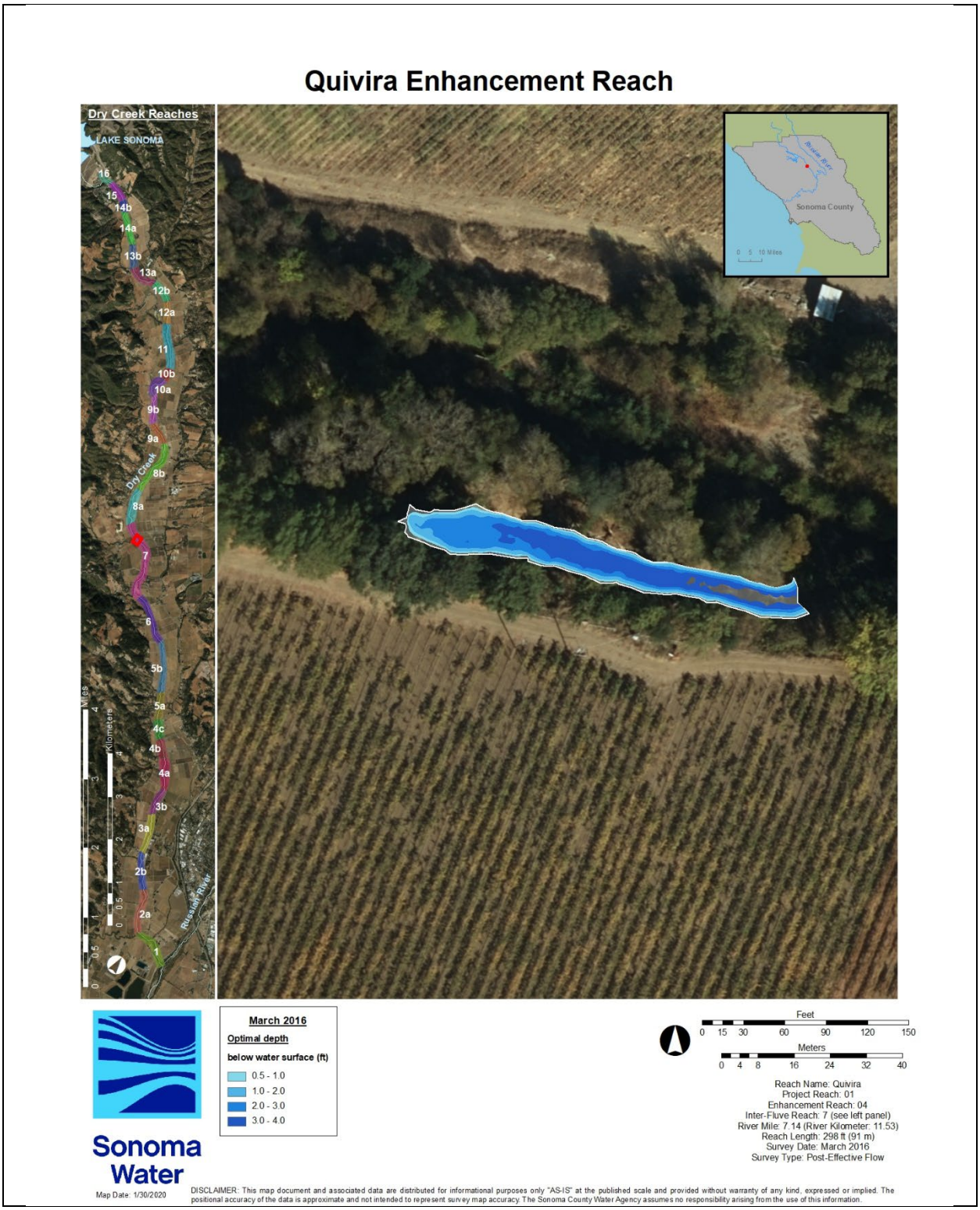

Figure QU-2. Optimal water depth for fry (0.5-2.0 ft) and parr (2.0-4.0 ft) within the Quivira enhancement reach, March 2016.

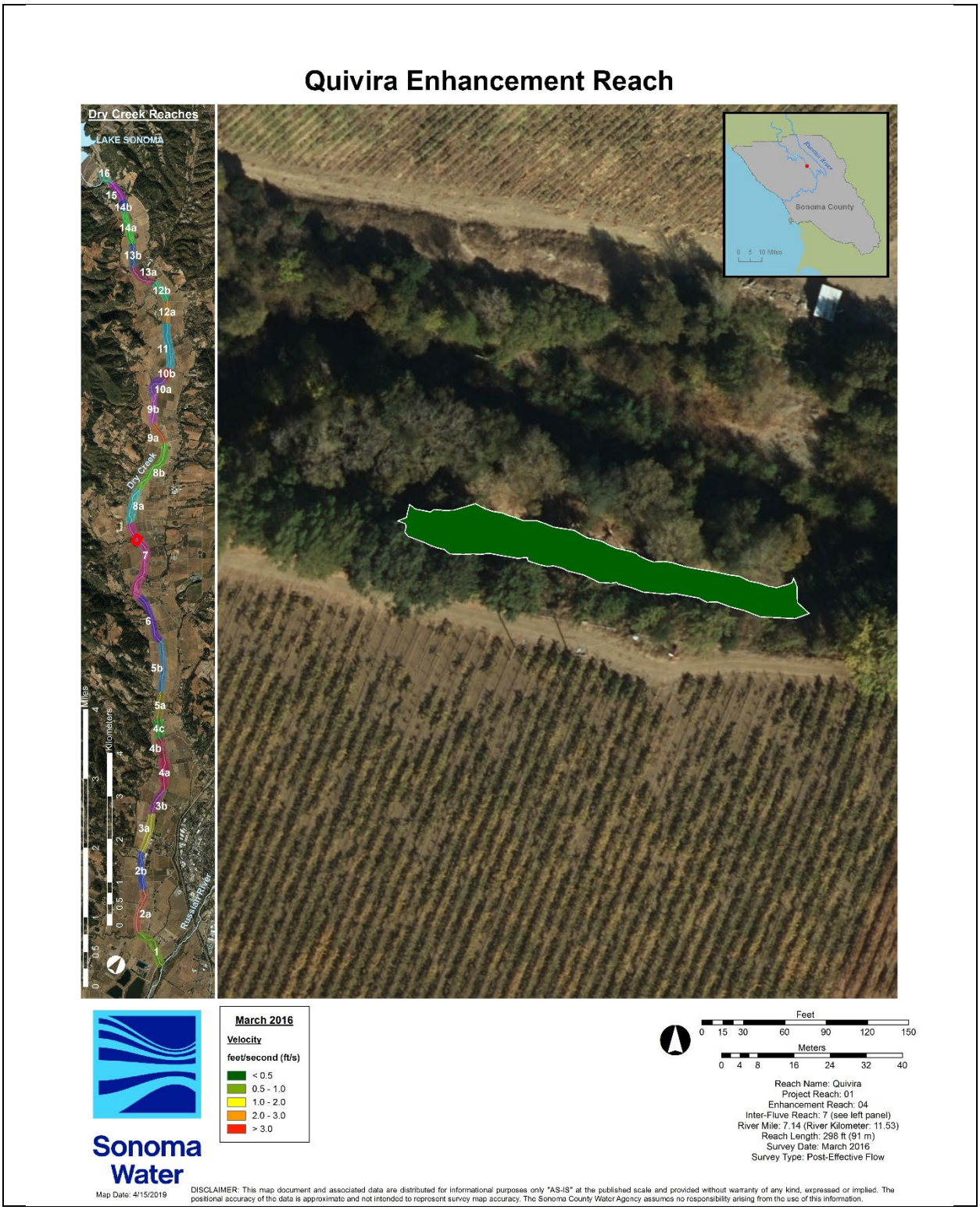

Figure QU-3. Measured water velocity within the Quivira enhancement reach, March 2016.

Figure QU-4. Optimal water velocity for fry and parr (< 0.5 ft/s) within the Quivira enhancement reach, March 2016.

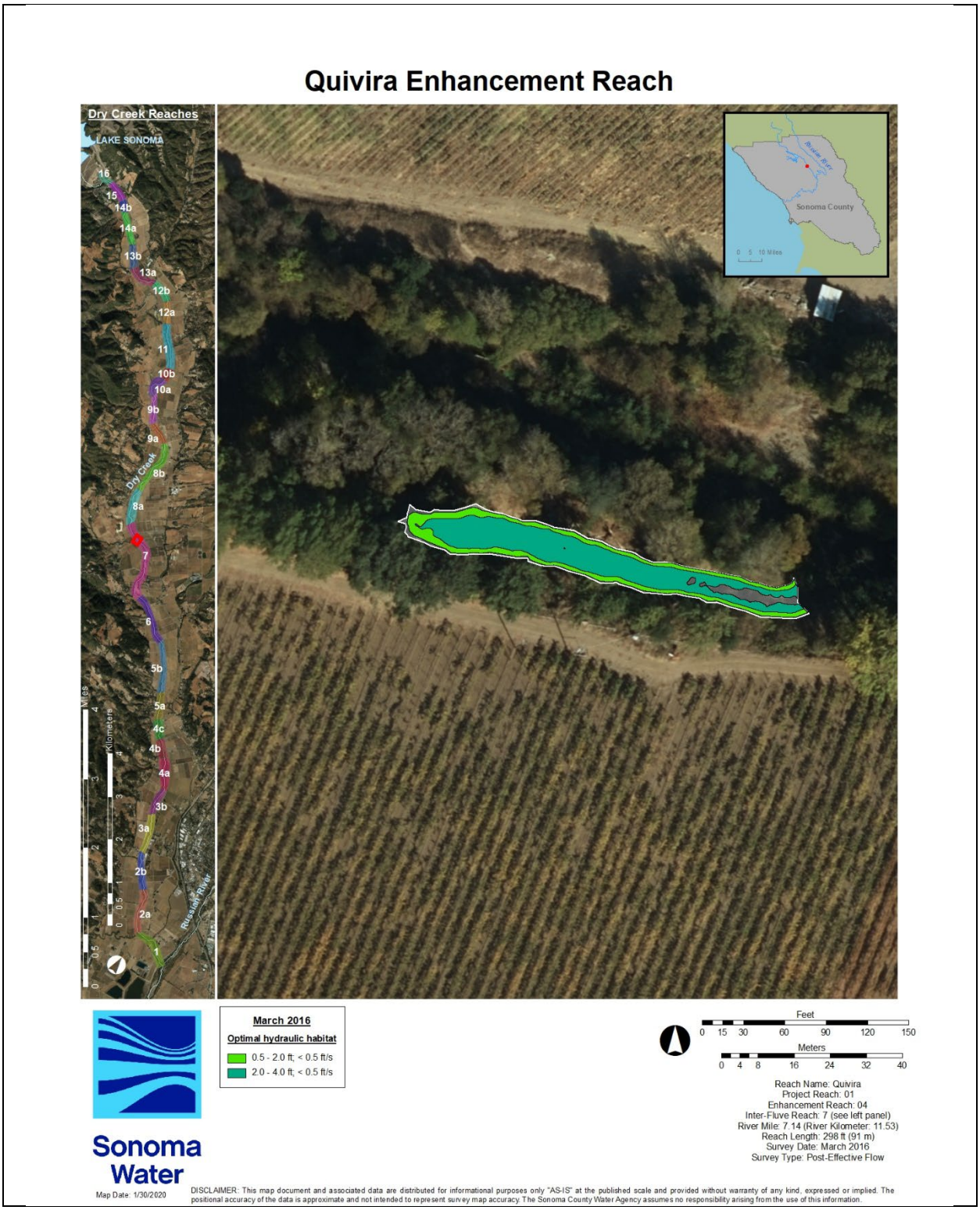

Figure QU-5. Optimal hydraulic habitat for fry (<0.5 ft/s, 0.5-2.0 ft) and parr (<0.5 ft/s, 2.0-4.0 ft) within the Quivira enhancement reach, March 2016.

Habitat Types and Shelter Values

Table QU-2. Habitat, types, shelter value, percent cover, and shelter score for off channel habitat units within the Quivira enhancement reach, March 2016.

Habitat Unit #	Habitat Type	Shelter Value	Percent Cover	Shelter Score
HU01	Alcove	3	25	75

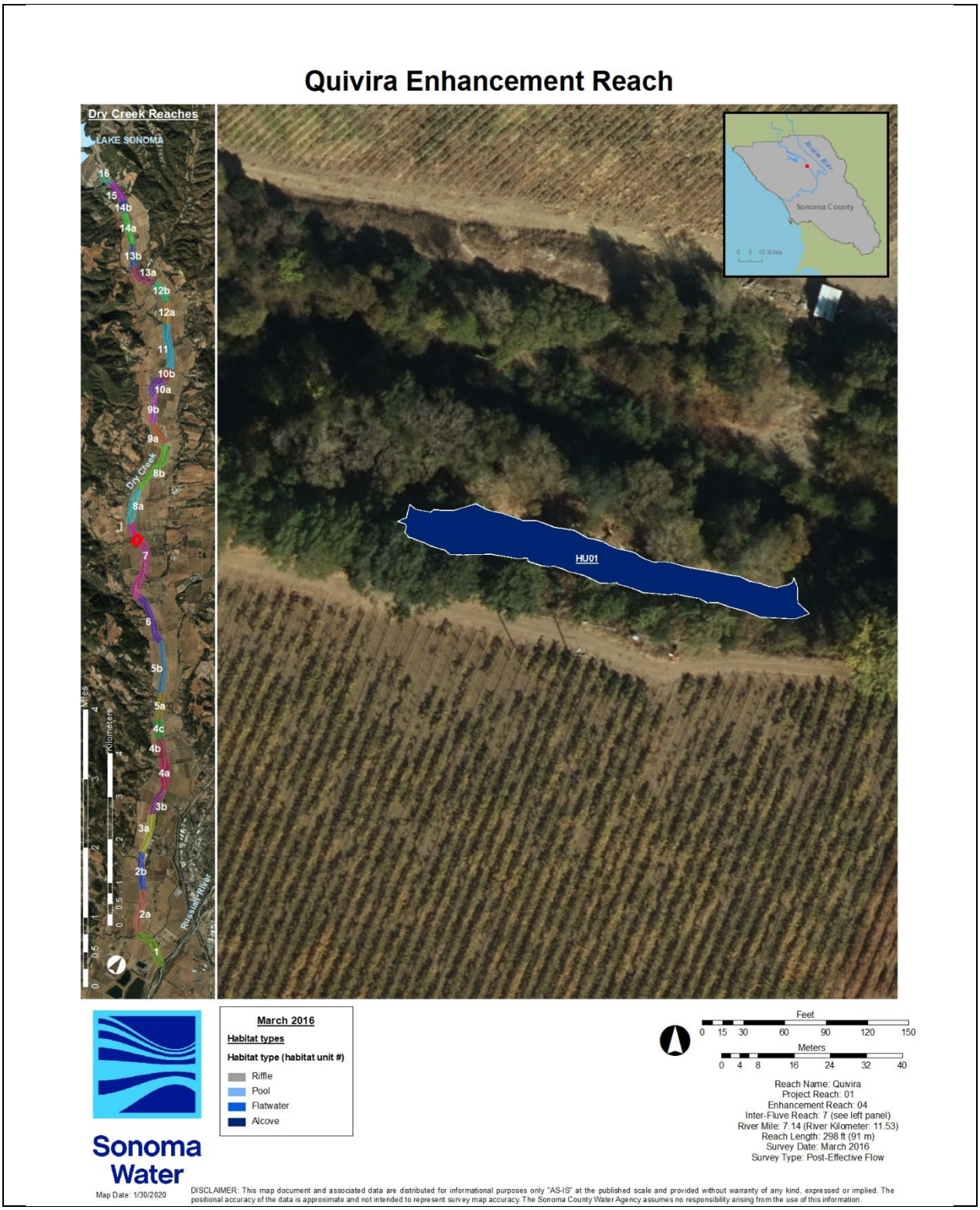

Figure QU-6. Habitat unit number and type within the Quivira enhancement reach, March 2016.

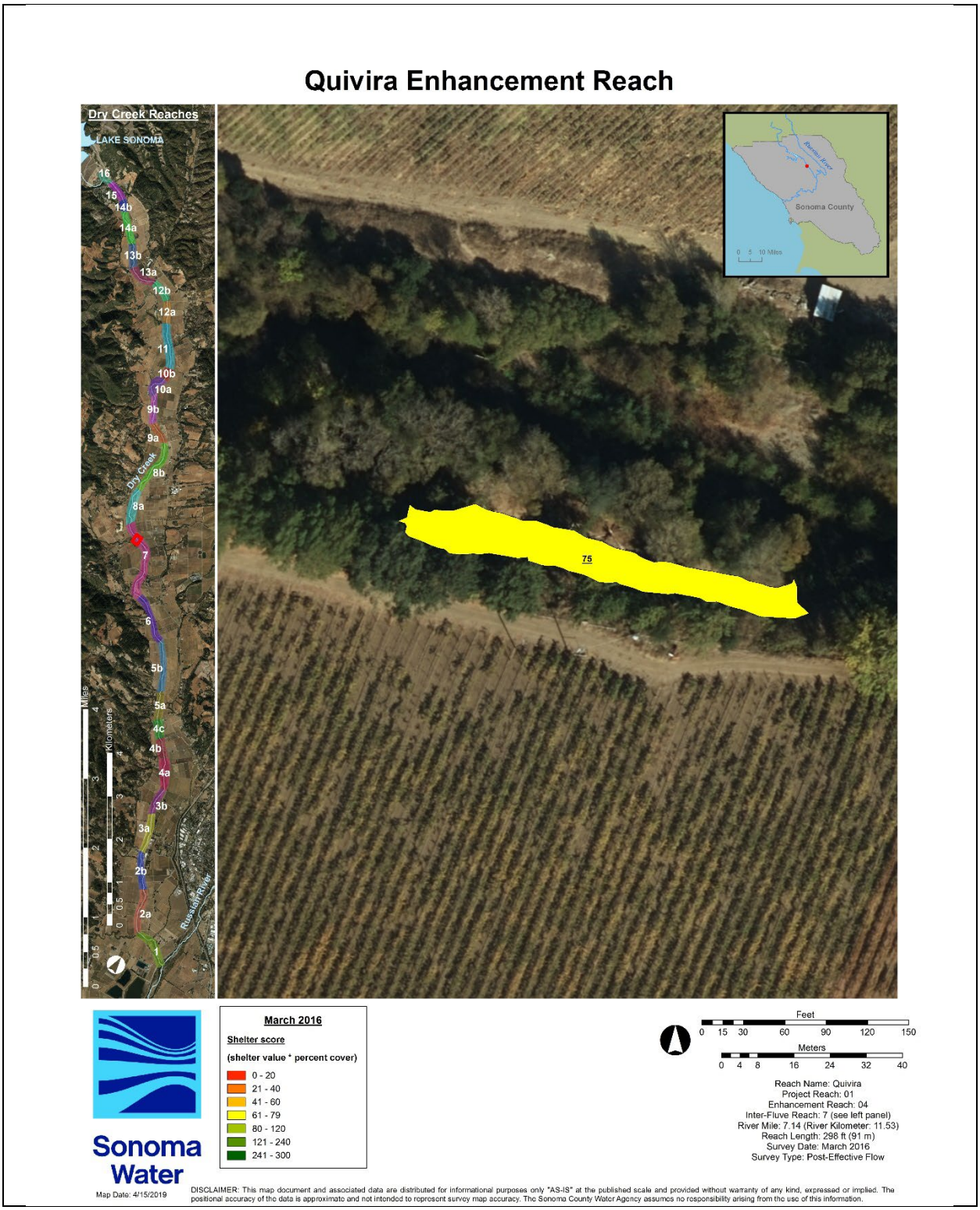

Figure QU-7. Habitat unit shelter values within the Quivira enhancement reach, March 2016.

Feature, Habitat Unit, Site, and Reach Ratings

Table QU-3. Post-effective flow feature ratings for the Quivira enhancement reach March 2016.

	Project Reach	1	1	1	1	1	1	1	1	1	1	1
	Enhancement Reach	4	4	4	4	4	4	4	4	4	4	4
	Colloquial Name	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU
	mmddyy	30916	30916	30916	30916	30916	30916	30916	30916	30916	30916	30916
	Survey Type	PEF	PEF	PEF	PEF	PEF	PEF	PEF	PEF	PEF	PEF	PEF
	PROJECT SITE NUMBER	1	1	1	2	2	2	2	2	2	3	3
	Project Site Type	MC Bank FP	MC Bank FP	MC Bank FP	MC Alcove	MC Alcove	MC Alcove	MC Alcove	MC Alcove	MC Alcove	MC Alcove	MC Alcove
	PROJECT FEATURE NUMBER	S1-01	S1-02	S1-03	S2-01	S2-02	S2-03	S2-04	S2-05	S2-06	S3-01	S3-02
	Feature Type Code	ELJ	ELJ	ELJ	ELJ	ELJ	ELJ	ELJ	ELJ	ELJ	WW	WW
	Habitat Unit	HU02_W	HU02_D	HU02_D	HU01	HU01	HU01	HU01	HU01	HU01	HU01_1	HU01_1
	Habitat Type	Flatwater	Dry	Dry	Alcove	Alcove	Alcove	Alcove	Alcove	Alcove	Alcove	Alcove
4.	Structural condition of **feature**: EXCL, GOOD, FAIR, POOR, FAIL	EXCL	EXCL	EXCL	GOOD	GOOD	GOOD	EXCL	EXCL	EXCL	GOOD	GOOD
5a	Are problems with the **feature** visible?	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
6a	Is the **feature** still in its original location?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
6b	Is the **feature** still in its original position?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
6d	Is the **feature** still in its original orientaton?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
8.	If an objective, did the **feature** create the targeted instream habitat type?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
9.	Were there any unintended effects by the **feature** on the habitat type? If Y, comment.	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
17a	If an objective, did the **feature** increase instream shelter rating?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
19a	If an objective, did the **feature** increase LWD count in the **habitat unit**?	YES	YES	NO	NO	YES	YES	NO	NO	NO	NO	NO
21a	If an objective, did the **feature** lead to the targeted channel conditions?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
25.	Did the **feature** achieve the targeted velocity?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
	PROJECT FEATURE NUMBER	**S1-01**	**S1-02**	**S1-03**	**S2-01**	**S2-02**	**S2-03**	**S2-04**	**S2-05**	**S2-06**	**S3-01**	**S3-02**
4.	Structural condition of **feature**: EXCL (5 pts), GOOD (4 pts), FAIR (3 pts), POOR (2 pts), FAIL (1 pt)	5	5	5	4	4	4	5	5	5	4	4
5a	Are problems with the **feature** visible? (NO = 1 pt, YES = 0 pt)	1	1	1	0	1	1	1	1	1	1	1
6a	Is the **feature** still in its original location? (YES = 1 pt, NO = 0 pt)	1	1	1	1	1	1	1	1	1	1	1
6b	Is the **feature** still in its original position? (YES = 1 pt, NO = 0 pt)	1	1	1	1	1	1	1	1	1	1	1
6d	Is the **feature** still in its original orientaton? (YES = 1 pt, NO = 0 pt)	1	1	1	1	1	1	1	1	1	1	1
8.	If an objective, did the **feature** create the targeted instream habitat type? (YES = 1 pt, NO = 0 pt)	1	1	1	1	1	1	1	1	1	1	1
9.	Were there any unintended effects by the **feature** on the habitat type? (NO = 1 pt, YES = 0 pt)	1	0	1	1	1	1	1	1	1	1	1
17a	If an objective, did the **feature** increase instream shelter rating? (YES = 1 pt, NO = 0 pt)	1	1	1	1	1	1	1	1	1	1	1
19a	If an objective, did the **feature** increase LWD count in the **habitat unit**? (YES = 1 pt, NO = 0 pt)	1	1	0	0	1	1	0	0	0	0	0
21a	If an objective, did the **feature** lead to the targeted channel conditions? (YES = 1 pt, NO = 0 pt)	1	1	1	1	1	1	1	1	1	1	1
25.	Did the **feature** achieve the targeted velocity? (YES = 1 pt, NO = 0 pt)	FALSE	1	1	1	1	1	1	1	1	1	1
	PROJECT FEATURE NUMBER	**S1-01**	**S1-02**	**S1-03**	**S2-01**	**S2-02**	**S2-03**	**S2-04**	**S2-05**	**S2-06**	**S3-01**	**S3-02**
FEATURE RATING	Feature quantitative rating out of 15	14	14	14	12	14	14	14	14	14	13	13
	Feature qualitative rating Excellent (>=12), Good (>=9), Fair(>=6), Poor (>=3), Fail (<3)	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

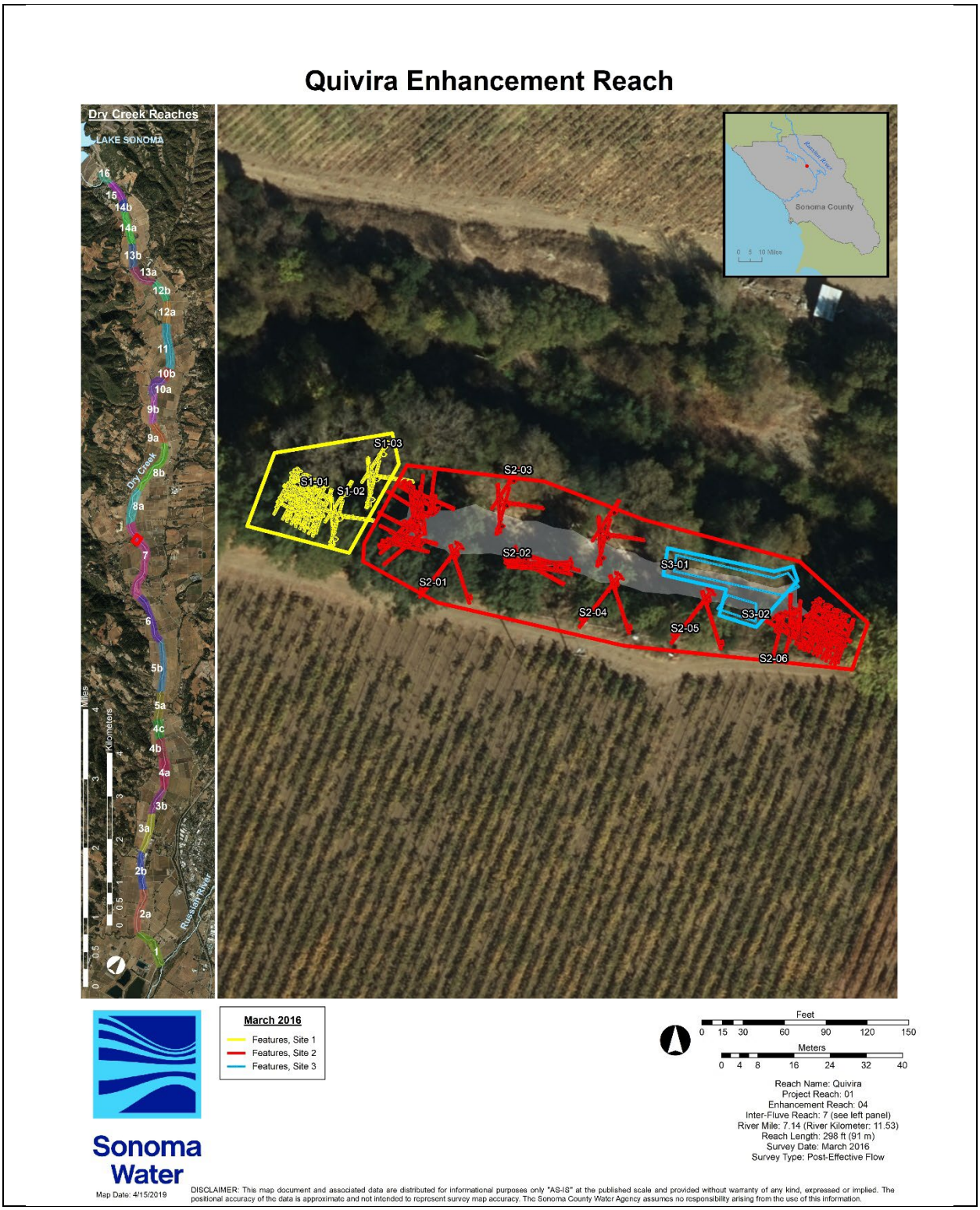

Figure QU-8. Enhancement sites and features within the Quivira enhancement reach, March 2016.

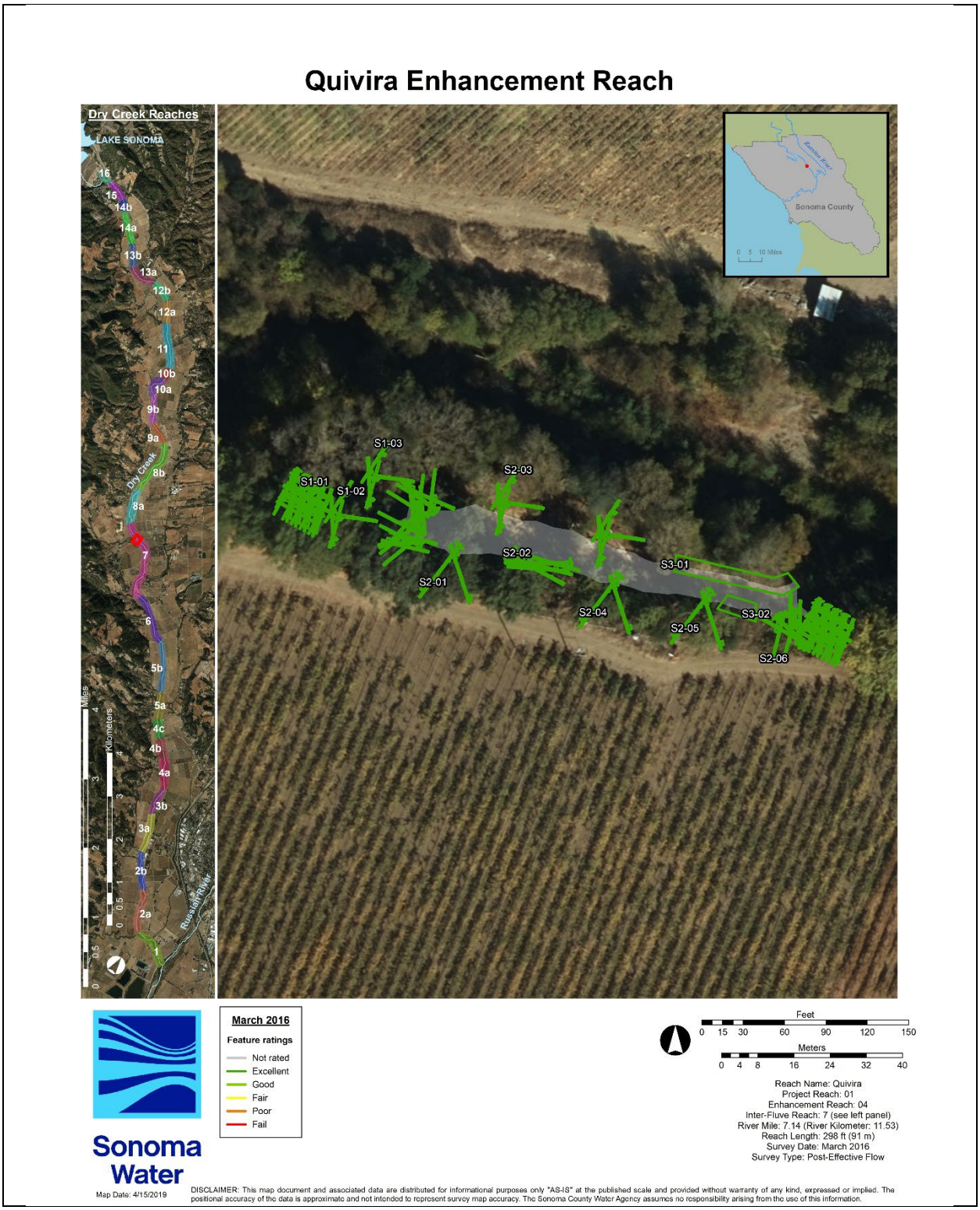

Figure QU-9. Feature ratings for the Quivira enhancement reach, March 2016.

Table QU-4. Post-effective flow habitat unit ratings for the Quivira enhancement reach March 2016.

	Project Reach	1	1	1	1
	Enhancement Reach	4	4	4	4
	Colloquial Name	QU	QU	QU	QU
	mmddyy	30916	30916	30916	30916
	Survey Type	PEF	PEF	PEF	PEF
	HABITAT UNIT NUMBER	**HU01**	**HU02_D**	**HU02_W**	**HU01_1**
	Habitat Type	Alcove	Dry	Flatwater	Alcove
	PROJECT SITE NUMBER	**2**	**1**	**1**	**3**
	Project Site Type	MC Alcove	MC Bank FP	MC Bank FP	MC Alcove
11e	% Area of **habitat unit** within 0.5 -2.0 ft depth	26%	0%	0%	26%
11f	% Area of **habitat unit** within 2.0 -4.0 ft depth	60%	0%	0%	60%
14.	Instream shelter value in the **habitat unit**: 0, 1, 2, 3	3	0	0	3
15.	Percent of **habitat unit** covered by shelter: %	25	0	0	25
17b	a. Calculate the shelter rating for the **habitat unit**: 0-300	75	0	0	75
28.	Percent of **habitat unit** within targeted velocity (see above): (%)	100%	0%	0%	100%
36e	% **habitat unit** area where < 0.5 f/s; 0.5 to 2 ft and shelter criteria overlap	26%	0%	0%	26%
36f	% **habitat unit** area where < 0.5 f/s; 2 to 4 ft and shelter criteria overlap	60%	0%	0%	60%
	HABITAT UNIT NUMBER	**HU01**	**HU02_D**	**HU02_W**	**HU01_1**
11e	% area of **hab unit** within 0.5 -2.0 ft depth (≥40 = 4 pts, ≥30 = 3 pts, ≥20 = 2 pts, ≥10 = 1 pt, <10 = 0 pt)	2	0	0	2
11f	% area of **hab unit** within 2.0 -4.0 ft depth (≥40 = 4 pts, ≥30 = 3 pts, ≥20 = 2 pts, ≥10 = 1 pt, <10 = 0 pt)	4	0	0	4
14.	Instream shelter value in the **habitat unit**: 0, 1, 2, 3 (3 = 5 pts; 2 = 4 pts, 1 = 3 pts, 0 = 0 pts)	5	0	0	5
15.	% **hab unit** covered by shelter (≥80 = 5pts; ≥60 = 4 pts; ≥40 = 3 pts; ≥20 = 2 pts; ≥10 = 1 pt; <10 = 0 pt)	2	0	0	2
17b	a. Calculate the shelter rating for the **habitat unit**: 0-300	2	0	0	2
28.	% area of **hab unit** within targeted velocity (≥40 = 4 pts, ≥30 = 3 pts, ≥20 = 2 pts, ≥10 = 1 pt, <10 = 0 pt)	4	0	0	4
36e	% area **hab unit** with < 0.5 f/s; 0.5 to 2 ft (≥40 = 4 pts, ≥30 = 3 pts, ≥20 = 2 pts, ≥10 = 1 pt, <10 = 0 pt)	2	0	0	2
36f	% area **hab unit** with < 0.5 f/s; 2 to 4 ft (≥40 = 4 pts, ≥30 = 3 pts, ≥20 = 2 pts, ≥10 = 1 pt, <10 = 0 pt)	4	0	0	4
	HABITAT UNIT NUMBER	**HU01**	**HU02_D**	**HU02_W**	**HU01_1**
HABITAT UNIT RATING	Habitat unit quantitative rating (out of 35)	25	0	0	25
	Habitat unit qualitative rating: Excellent (>=28), Good (>=21), Fair(>=14), Poor (>=7), Fail (<7)	Good	Not rated	Not rated	Good

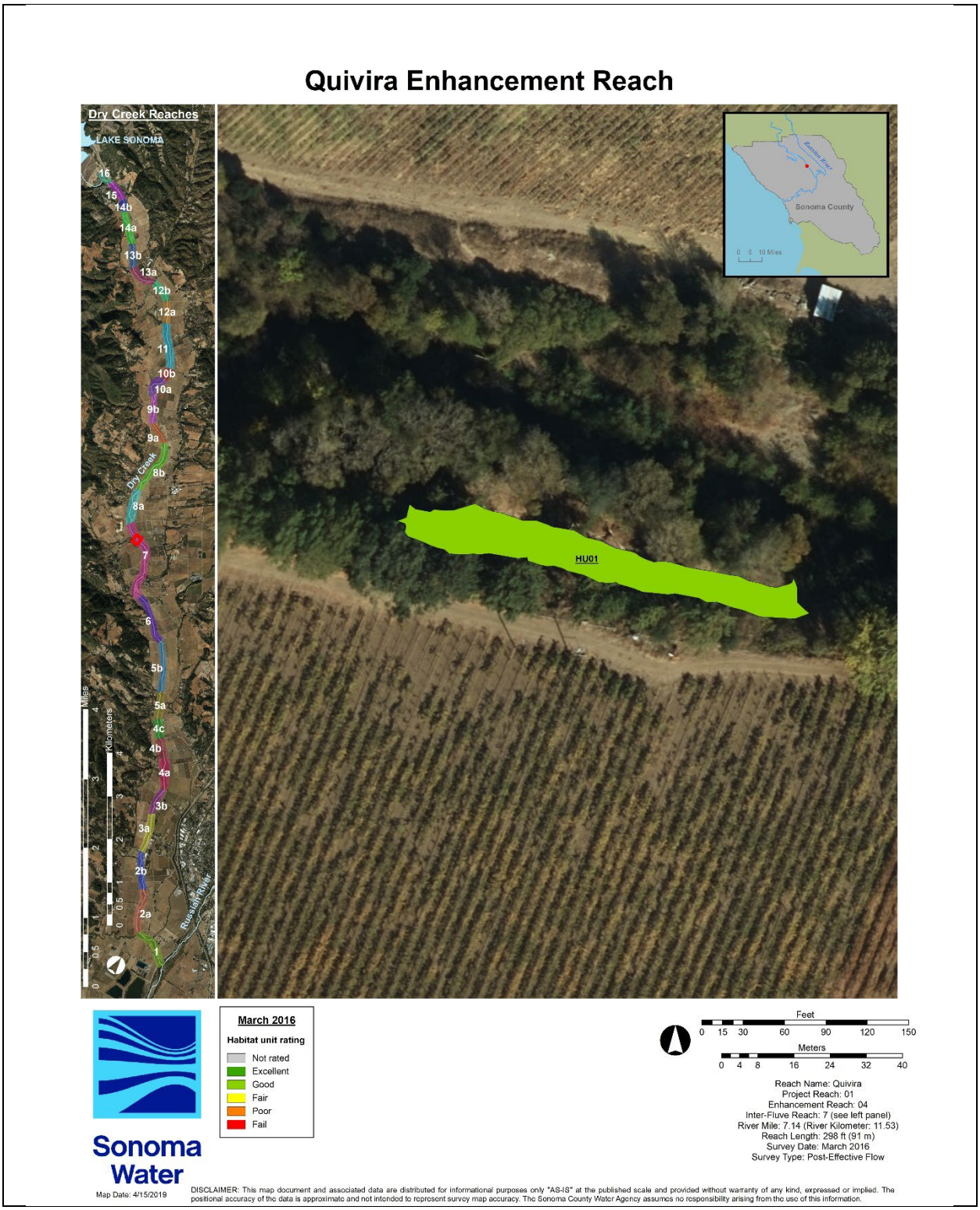

Figure QU-10. Habitat unit ratings for the Quivira enhancement reach, March 2016.

Table QU-5. Post-effective flow average feature, average habitat unit, site, and reach ratings for the Quivira enhancement reach, March 2016.

	Project Reach	1	1	1
	Enhancement Reach	4	4	4
	ENHANCEMENT REACH NAME	**QU**	**QU**	**QU**
	mmddyy	30916	30916	30916
	Survey Type	PEF	PEF	PEF
	PROJECT SITE NUMBER	**1**	**2**	**3**
	Project Site Type	MC Bank FP	MC Alcove	MC Alcove
	PROJECT SITE NUMBER	**1**	**2**	**3**
SITE AVERAGE FEATURE RATING	Site average feature quantitative rating (out of 15; bold indicates excluded from site rating)	14	14	13
	Site average feature qualitative rating Excellent (>=12), Good (>=9), Fair(>=6), Poor (>=3), Fail (<3), Not rated (not used to rate site)	Excellent	Excellent	Excellent
	PROJECT SITE NUMBER	**1**	**2**	**3**
SITE AVERAGE HABITAT UNIT RATING	Site average habitat unit quantitative rating (out of 35; bold indicates excluded from site rating)	0	25	0
	Site average qualitative rating Excellent (>=28), Good (>=21), Fair(>=14), Poor (>=7), Fail (<7), Not rated (not used to rate site)	Not rated	Good	Not rated
	PROJECT SITE NUMBER	**1**	**2**	**3**
SITE RATING	Site quantitative rating (sum of site average feature and habitat unit ratings) (out of 50; bold indicates rating excludes feature or habitat unit rating and scoring out of **15** or 35)	**14**	39	13
	Site qualitative rating: Excellent (>=40, 12), Good (>=30, 9), Fair(>=20, 6), Poor (>=10, 3), Fail (<10, 3)	Excellent	Good	Excellent
	ENHANCEMENT REACH NAME	**QU**		
ENHANCEMENT REACH RATING	Enhancement reach quantitative rating (average of site ratings) (out of 38)	22		
	Enhancement reach qualitative rating: Excellent (>=31), Good (>=23), Fair(>=15), Poor (>=8), Fail (<8)	Excellent		

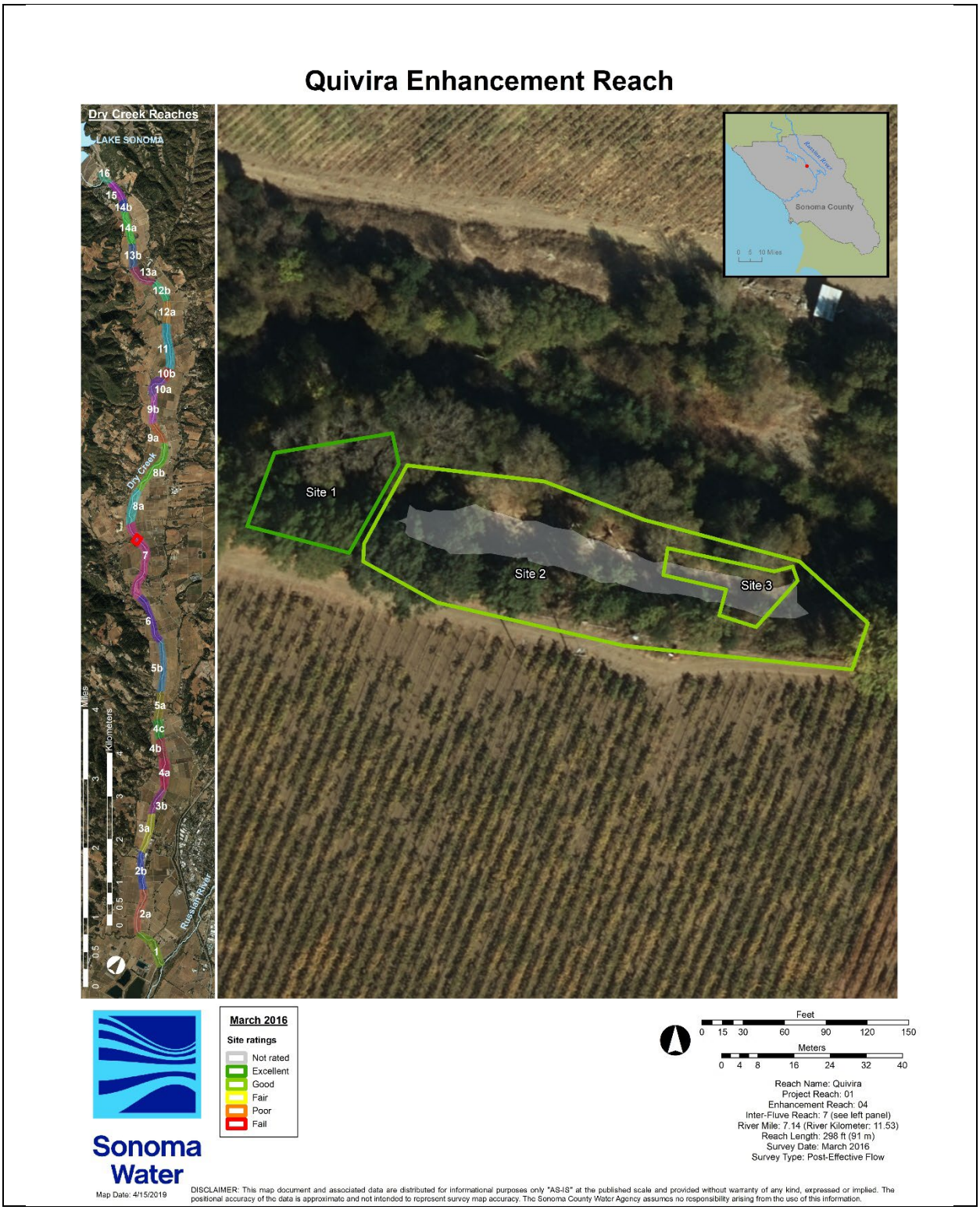

Figure QU-11. Post-effective flow site ratings for the Quivira enhancement reach, March 2016.

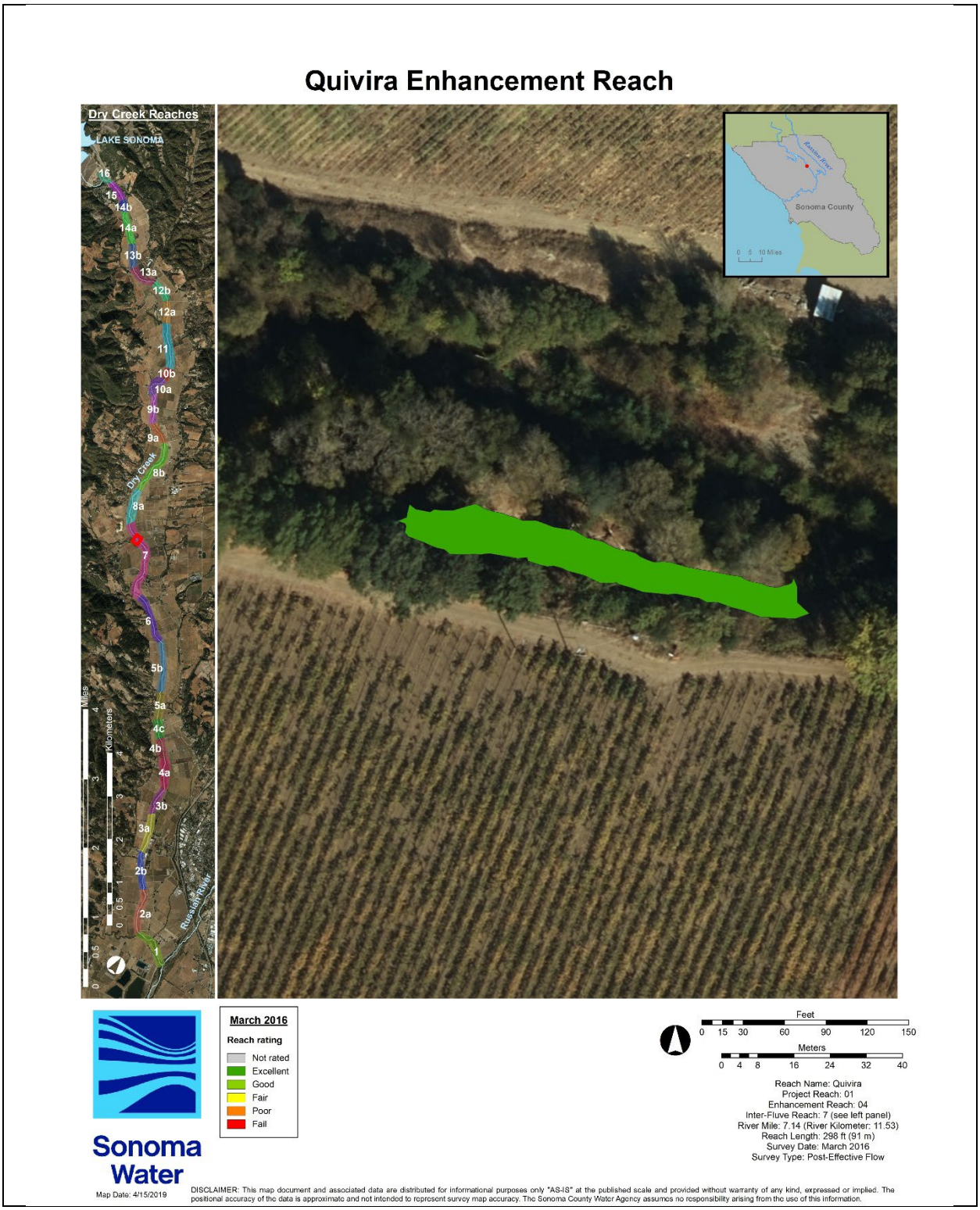

Figure QU-12. Post-effective flow reach rating for the Quivira enhancement reach, March 2016.

Feature and Habitat Unit Checklists

Table QU-6. Adaptive Management Plan targeted checklist for the Quivira enhancement reach, March 2016.

	Project Reach	1	1	1	1	1	1	1	1	1	1	1
	Enhancement Reach	4	4	4	4	4	4	4	4	4	4	4
	Colloquial Name	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU
	mmddyy	30916	30916	30916	30916	30916	30916	30916	30916	30916	30916	30916
	Survey Type	PEF	PEF	PEF	PEF	PEF	PEF	PEF	PEF	PEF	PEF	PEF
	Project Site Number	1	1	1	2	2	2	2	2	2	3	3
	Project Site Type	MC Bank FP	MC Bank FP	MC Bank FP	MC Alcove	MC Alcove	MC Alcove	MC Alcove	MC Alcove	MC Alcove	MC Alcove	MC Alcove
	Project Feature Number	S1-01	S1-02	S1-03	S2-01	S2-02	S2-03	S2-04	S2-05	S2-06	S3-01	S3-02
	Feature Type Code	ELJ	ELJ	ELJ	ELJ	ELJ	ELJ	ELJ	ELJ	ELJ	WW	WW
	Habitat Unit	HU02_W	HU02_D	HU02_D	HU01	HU01	HU01	HU01	HU01	HU01	HU01_1	HU01_1
	Habitat Type	Flatwater	Dry	Dry	Alcove	Alcove	Alcove	Alcove	Alcove	Alcove	Alcove	Alcove
4.	Structural condition of **feature**: EXCL, GOOD, FAIR, POOR, FAIL	EXCL	EXCL	EXCL	GOOD	GOOD	GOOD	EXCL	EXCL	EXCL	GOOD	GOOD
5a	Are problems with the **feature** visible?	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
6a	Is the **feature** still in its original location?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
6b	Is the **feature** still in its original position?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
6d	Is the **feature** still in its original orientaton?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
8.	If an objective, did the **feature** create the targeted instream habitat type?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
9.	Were there any unintended effects by the **feature** on the habitat type? If Y, comment:	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
11e	% Area of **habitat unit** within 0.5 -2.0 ft depth	0%	0%	0%	26%	26%	26%	26%	26%	26%	26%	26%
11f	% Area of **habitat unit** within 2.0 -4.0 ft depth	0%	0%	0%	60%	60%	60%	60%	60%	60%	60%	60%
14.	Instream shelter value in the **habitat unit**: 0, 1, 2, 3	0	0	0	3	3	3	3	3	3	3	3
15.	Percent of **habitat unit** covered by shelter: %	0	0	0	25	25	25	25	25	25	25	25
17a	If an objective, did the **feature** increase instream shelter rating?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
17b	a. Calculate the shelter rating for the **habitat unit**: 0-300	0	0	0	75	75	75	75	75	75	75	75
19a	If an objective, did the **feature** increase LWD count in the **habitat unit**?	YES	YES	NO	NO	YES	YES	NO	NO	NO	NO	NO
21a	If an objective, did the **feature** lead to the targeted channel conditions?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
25.	Did the **feature** achieve the targeted velocity?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
28.	Percent of **habitat unit** within targeted velocity (see above): (%)	0%	0%	0%	100%	100%	100%	100%	100%	100%	100%	100%
36e	% **habitat unit** area where < 0.5 f/s; 0.5 to 2 ft and shelter criteria overlap	0%	0%	0%	26%	26%	26%	26%	26%	26%	26%	26%
36f	% **habitat unit** area where < 0.5 f/s; 2 to 4 ft and shelter criteria overlap	0%	0%	0%	60%	60%	60%	60%	60%	60%	60%	60%
	FEATURE NUMBER	**S1-01**	**S1-02**	**S1-03**	**S2-01**	**S2-02**	**S2-03**	**S2-04**	**S2-05**	**S2-06**	**S3-01**	**S3-02**
	HABITAT UNIT NUMBER	**HU02_W**	**HU02_D**	**HU02_D**	**HU01**	**HU01**	**HU01**	**HU01**	**HU01**	**HU01**	**HU01_1**	**HU01_1**
	SITE NUMBER	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**3**
	ENHANCEMENT REACH NAME	**QU**	**QU**	**QU**	**QU**	**QU**	**QU**	**QU**	**QU**	**QU**	**QU**	**QU**
4.	Structural condition of **feature**: EXCL (5 pts), GOOD (4 pts), FAIR (3 pts), POOR (2 pts), FAIL (1 pt)	5	5	5	4	4	4	5	5	5	4	4
5a	Are problems with the **feature** visible? (NO = 1 pt, YES = 0 pt)	1	1	1	0	1	1	1	1	1	1	1
6a	Is the **feature** still in its original location? (YES = 1 pt, NO = 0 pt)	1	1	1	1	1	1	1	1	1	1	1
6b	Is the **feature** still in its original position? (YES = 1 pt, NO = 0 pt)	1	1	1	1	1	1	1	1	1	1	1
6d	Is the **feature** still in its original orientaton? (YES = 1 pt, NO = 0 pt)	1	1	1	1	1	1	1	1	1	1	1
8.	If an objective, did the **feature** create the targeted instream habitat type? (YES = 1 pt, NO = 0 pt)	1	1	1	1	1	1	1	1	1	1	1
9.	Were there any unintended effects by the **feature** on the habitat type? (NO = 1 pt, YES = 0 pt)	1	0	1	1	1	1	1	1	1	1	1
11e	% area of **hab unit** within 0.5 -2.0 ft depth (≥40 = 4 pts, ≥30 = 3 pts, ≥20 = 2 pts, ≥10 = 1 pt, <10 = 0 pt)	0	0	0	2	2	2	2	2	2	2	2
11f	% area of **hab unit** within 2.0 -4.0 ft depth (≥40 = 4 pts, ≥30 = 3 pts, ≥20 = 2 pts, ≥10 = 1 pt, <10 = 0 pt)	0	0	0	4	4	4	4	4	4	4	4
14.	Instream shelter value in the **habitat unit**: 0, 1, 2, 3 (3 = 5 pts, 2 = 4 pts, 1 = 3 pts, 0 = 0 pts)	0	0	0	5	5	5	5	5	5	5	5
15.	% **hab unit** covered by shelter (≥80 = 5pts; ≥60 = 4 pts; ≥40 = 3 pts; ≥20 = 2 pts; ≥10 = 1 pt; <10 = 0 pt)	0	0	0	2	2	2	2	2	2	2	2
17a	If an objective, did the **feature** increase instream shelter rating? (YES = 1 pt, NO = 0 pt)	1	1	1	1	1	1	1	1	1	1	1
17b	a. Calculate the shelter rating for the **habitat unit**: 0-300	0	0	0	2	2	2	2	2	2	2	2
19a	If an objective, did the **feature** increase LWD count in the **habitat unit**? (YES = 1 pt, NO = 0 pt)	1	1	0	0	1	1	0	0	0	0	0
21a	If an objective, did the **feature** lead to the targeted channel conditions? (YES = 1 pt, NO = 0 pt)	1	1	1	1	1	1	1	1	1	1	1
25.	Did the **feature** achieve the targeted velocity? (YES = 1 pt, NO = 0 pt)	FALSE	1	1	1	1	1	1	1	1	1	1
28.	% area of **hab unit** within targeted velocity (≥40 = 4 pts, ≥30 = 3 pts, ≥20 = 2 pts, ≥10 = 1 pt, <10 = 0 pt)	0	0	0	4	4	4	4	4	4	4	4
36e	% area **hab unit** with < 0.5 f/s; 0.5 to 2 ft (≥40 = 4 pts, ≥30 = 3 pts, ≥20 = 2 pts, ≥10 = 1 pt, <10 = 0 pt)	0	0	0	2	2	2	2	2	2	2	2
36f	% area **hab unit** with < 0.5 f/s; 2 to 4 ft (≥40 = 4 pts, ≥30 = 3 pts, ≥20 = 2 pts, ≥10 = 1 pt, <10 = 0 pt)	0	0	0	4	4	4	4	4	4	4	4

Table QU-7. Adaptive Management Plan full checklist for the Quivira enhancement reach, March 2016.

	Project Reach	1	1	1	1	1	1	1	1	1	1	1
	Enhancement Reach	4	4	4	4	4	4	4	4	4	4	4
	Colloquial Name	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU
	mmddyy	30916	30916	30916	30916	30916	30916	30916	30916	30916	30916	30916
	Survey Type	PEF	PEF	PEF	PEF	PEF	PEF	PEF	PEF	PEF	PEF	PEF
	Project Site Number	1	1	1	2	2	2	2	2	2	3	3
	Project Site Type	MC Bank FP	MC Bank FP	MC Bank FP	MC Alcove	MC Alcove	MC Alcove	MC Alcove	MC Alcove	MC Alcove	MC Alcove	MC Alcove
	Project Feature Number	S1-01	S1-02	S1-03	S2-01	S2-02	S2-03	S2-04	S2-05	S2-06	S3-01	S3-02
	Feature Type Code	ELJ	ELJ	ELJ	ELJ	ELJ	ELJ	ELJ	ELJ	ELJ	WW	WW
	Habitat Unit	HU02_W	HU02_D	HU02_D	HU01	HU01	HU01	HU01	HU01	HU01	HU01_1	HU01_1
	Habitat Type	Flatwater	Dry	Dry	Alcove	Alcove	Alcove	Alcove	Alcove	Alcove	Alcove	Alcove
1.	Length of targeted treatment (ft)	56	23	16	78	40	90	21	13	85	89	41
2.	Width of targeted treatment: (ft)	46	59	45	49	22	16	23	16	41	66	41
3.	Estimate area of the targeted **feature**: (ft^2)	2576	1357	720	3822	880	1440	483	208	3485	5874	1681
4.	Structural condition of **feature**: EXCL, GOOD, FAIR, POOR, FAIL	EXCL	EXCL	EXCL	GOOD	GOOD	GOOD	EXCL	EXCL	EXCL	GOOD	GOOD
5a	Are problems with the **feature** visible?	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
5b	Types: ANC, BBB, CRF, MAT, SHF, STR, SWA, UND, UNS, WSH, OTH, NON	NON	NON	NON	AGG	NON	NON	NON	NON	NON	NON	NON
6a	Is the **feature** still in its original location?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
6b	Is the **feature** still in its original position?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
6c	If yes: LBK, MDC, RBK, SPN, OTH	RBK	RBK	RBK	OTH	RBK	LBK	RBK	RBK	RBK	LBK	RBK
6d	Is the **feature** still in its original orientaton?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
6e	If yes: DNS, MUL, PRL, PRP, UPS, OTH	MUL	PRP	PRP	MUL	PRL	PRP	PRP	PRP	MUL	PRL	PRL
7.	Current level II habitat type: FLT, POO, RIF, DRY, ALC, OTH	FLT	DRY	DRY	ALC	ALC	ALC	ALC	ALC	ALC	ALC	ALC
8.	If an objective, did the **feature** create the targeted instream habitat type?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
9.	Were there any unintended effects by the **feature** on the habitat type? If Y, comment.	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
10.	Mean water depth in **habitat unit**: ft	0.0	0.0	0.0	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
11a	Maximum water depth in **habitat unit**: ft	0.0	0.0	0.0	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
11b	Area of **habitat unit** within 0.5 -2.0 ft depth: (ft2)	0.0	0.0	0.0	1960.4	1960.4	1960.4	1960.4	1960.4	1960.4	1960.4	1960.4
11c	Area of **habitat unit** within 2.0 -4.0 ft depth: (ft2)	0.0	0.0	0.0	4586.2	4586.2	4586.2	4586.2	4586.2	4586.2	4586.2	4586.2
11d	Area of **habitat unit** within 0.5-4.0 ft depth: (ft2)	0.0	0.0	0.0	6546.7	6546.7	6546.7	6546.7	6546.7	6546.7	6546.7	6546.7
11e	% Area of **habitat unit** within 0.5 -2.0 ft depth	0%	0%	0%	26%	26%	26%	26%	26%	26%	26%	26%
11f	% Area of **habitat unit** within 2.0 -4.0 ft depth	0%	0%	0%	60%	60%	60%	60%	60%	60%	60%	60%
11g	% Area of **habitat** unit within 0.5-4.0 ft depth	0%	0%	0%	86%	86%	86%	86%	86%	86%	86%	86%
11h	If an objective, did the **feature** increase/decrease water depth in the treatment area?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
12a	Targeted depth or range (ft) in **habitat unit**	0.5-4.0	0.5-4.0	0.5-4.0	0.5-4.0	0.5-4.0	0.5-4.0	0.5-4.0	0.5-4.0	0.5-4.0	0.5-4.0	0.5-4.0
12b	Estimate area of **feature** within targeted depth or range ft^2:	2576	1357	720	3822	880	1440	483	208	3485	5874	1681
13.	Were there any unintended effects of the **feature** on the water depth? If Y, comment.	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
14.	Instream shelter value in the **habitat unit**: 0, 1, 2, 3	0	0	0	3	3	3	3	3	3	3	3
15.	Percent of **habitat unit** covered by shelter: %	0	0	0	25	25	25	25	25	25	25	25
16a	1st dominant cover in **habitat unit**: BED, BOL, BUB, LWD, RTW, SWD, UCB, VEG, OTH	NON	NON	NON	LWD	LWD	LWD	LWD	LWD	LWD	LWD	LWD
16b	2nd dominant in **habitat unit**: BED, BOL, BUB, LWD, RTW, SWD, UCB, VEG, OTH	NON	NON	NON	RTW	RTW	RTW	RTW	RTW	RTW	RTW	RTW
17a	If an objective, did the **feature** increase instream shelter rating?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
17b	a. Calculate the shelter rating for the **habitat unit**: 0-300	0	0	0	75	75	75	75	75	75	75	75
18a	Large woody debris count in **habitat unit**: D >1', L 6-20'	0	0	0	3	3	3	3	3	3	3	3
18b	Large woody debris count in **habitat unit**: D >1', L >20'	0	0	0	2	2	2	2	2	2	2	2
19a	If an objective, did the **feature** increase LWD count in the **habitat unit**?	YES	YES	NO	NO	YES	YES	NO	NO	NO	NO	NO
19b	LWD recruitment mechanisms in **habitat unit**: ANC, EXC, EXH, INT, RPR, UNA, OTH	NON	NON	NON	UNK	UNK	UNK	UNK	UNK	UNK	UNK	UNK
20.	Current stream channel problems in the **habitat unit**: AGG, BRD, FLO, GRC, HDC, INC, NAR, SCU, STT, WID, NON, OTH	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
21a	If an objective, did the **feature** lead to the targeted channel conditions?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
21b	Overall Offchannel Condition (**site**): AGG, FPD, GRC, INC, NAR, SIN, STB, TOG, WID, OTH	STB	STB	STB	STB	STB	STB	STB	STB	STB	STB	STB
21c	Outlet Conditions (**site**): AGG, FPD, GRC, INC, NAR, SIN, STB, TOG, WID, OTH				STB	STB	STB	STB	STB	STB	STB	STB
21d	Inlet Conditions (**site**): AGG, FPD, GRC, INC, NAR, SIN, STB, TOG, WID, OTH				STB	STB	STB	STB	STB	STB	STB	STB
22.	Were there any unintended effects on the stream channel at the **feature**? If Y, comment.	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
23.	If an objective, did the **feature** decrease/increase velocity in the treatment area?	YES	NA	NA	DEC	DEC	DEC	DEC	DEC	DEC	DEC	DEC
24.	Targeted velocity/range in the **habitat unit**: (ft/sec)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
25.	Did the **feature** achieve the targeted velocity?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
26a	Measured minimum velocity (ft/sec) in **habitat unit**	0	0	0	0	0	0	0	0	0	0	0
26b	Measured max velocity (ft/sec) in **habitat unit**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26c	Measured mean velocity (ft/sec) in **habitat unit**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27.	Area of **habitat unit** within targeted velocity: (ft^2)	0.0	0.0	0.0	7585.3	7585.3	7585.3	7585.3	7585.3	7585.3	7585.3	7585.3
28.	Percent of **habitat unit** within targeted velocity (see above): (%)	0%	0%	0%	100%	100%	100%	100%	100%	100%	100%	100%
29.	Were there any unintended effects of **feature** on velocity If Y, comment.	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
30a	1st/2nd dominant substrate in **habitat unit**: BED, BOL, COB, GRV, SND, SLC, OTH	SND	SND	SND	SND	SND	SND	SND	SND	SND	SND	SND
30b	2nd dominant substrate in **habitat unit**: BED, BOL, COB, GRV, SND, SLC, OTH	GRV	GRV	GRV	GRV	GRV	GRV	GRV	GRV	GRV	GRV	GRV
31.	If an objective, did the **feature** achieve the targeted substrate composition?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
32.	% Canopy Measurement:	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
33.	Photopoint data collected: YES /NO	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
34.	Temperature Profile: YES /NO	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
35.	Dissolved Oxygen Profile: YES/NO	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
36a	Total **habitat unit** area where targeted depth, velocity and shelter criteria overlap	0.0	0.0	0.0	6546.7	6546.7	6546.7	6546.7	6546.7	6546.7	6546.7	6546.7
36b	Total **habitat unit** area where < 0.5 f/s; 0.5 to 2 ft and shelter criteria overlap	0.0	0.0	0.0	1960.4	1960.4	1960.4	1960.4	1960.4	1960.4	1960.4	1960.4
36c	Total **habitat unit** area where < 0.5 f/s; 2 to 4 ft and shelter criteria overlap	0.0	0.0	0.0	4586.2	4586.2	4586.2	4586.2	4586.2	4586.2	4586.2	4586.2
36d	% **habitat unit** area where targeted depth, velocity and shelter criteria overlap	0%	0%	0%	86%	86%	86%	86%	86%	86%	86%	86%
36e	% **habitat unit** area where < 0.5 f/s; 0.5 to 2 ft and shelter criteria overlap	0%	0%	0%	26%	26%	26%	26%	26%	26%	26%	26%
36f	% **habitat unit** area where < 0.5 f/s; 2 to 4 ft and shelter criteria overlap	0%	0%	0%	60%	60%	60%	60%	60%	60%	60%	60%
37.	Does this **feature** need: DEC, ENH, MNT, REP, NON, OTH	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
38.	Are additional restoration treatments recommended at this **site**?	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO