Montana Fish, Wildlife & Parks

May 30, 2013

PO Box 200701
930 Custer Ave W
Helena, MT 59620

Future Fisheries Board
PO Box 200701
Helena, MT 59620

Dear Board Members,

I am writing to submit a Future Fisheries application for a fish passage and habitat improvement project on Tenmile Creek in the Helena valley. Please find enclosed a Future Fisheries application form and other supporting materials.

This project began in 2011 after high spring flows washed out a deteriorating irrigation diversion dam. Current water users agreed to move the headgate upstream to a location where water could be efficiently conveyed while providing year-round fish passage. After contacting the various water right holders for the old diversion, all agreed to removing the old structure from the stream.

The landowner where the old diversion lies also had interest in modifying the stream on their parcel since equipment would already be mobilized to remove the old diversion and install the new headgate. Proposed treatments include installing 1,030 feet of tree revetments, root wads, and riparian fencing to reduce streambank erosion, develop more pool habitat, and promote vegetation growth to stabilize banks and shade the stream.

This project has been a collaborative effort involving eight water right owners, a home owners association, FWP, and the Conservation District. Contributors to this project include PPL Montana, Dean Bjerke, and the Ski Lakes Homeowners Association. This project will provide an efficient way to convey water for water users, as well as enhance fish passage and improve fish habitat.

Thank you for considering our application.

Sincerely,

Eric Roberts
Helena Area Fish Biologist

Enclosures

FUTURE FISHERIES IMPROVEMENT PROGRAM
GRANT APPLICATION
(please fill in the highlighted areas)

I. APPLICANT INFORMATION

A. Applicant Name: Eric Roberts, MT FWP

B. Mailing Address: PO Box 200701

C. City: Helena State: MT Zip: 59620

Telephone: 406-495-3272

D. Contact Person: Eric Roberts

Address if different from Applicant:

City: State: Zip:

Telephone:

E. Landowner and/or Lessee Name (if other than Applicant): Dean Bjerke

Mailing Address: PO Box 5987

City: Helena State: MT Zip: 59604

Telephone: 406-495-7168

II. PROJECT INFORMATION*

A. Project Name: Tenmile fish passage and bank stabilization

River, stream, or lake: Tenmile Creek

Location: Township 10N Range 3W Section 8

County: Lewis and Clark

B. Purpose of Project:

Modify an irrigation diversion structure to allow fish passage, improve fish habitat, fence stream from livestock.

C. Brief Project Description:

Remove an irrigation structure that has been deteriorating and was damaged during high flows in 2011 and move the headgate upstream to a location to allow more efficient water withdraw and allow fish passage. While mobilized to modify the diversion, additional treatments including erosion reduction measures, increased pool habitats, vegetation enhancement, and riparian fencing will be implemented.

D. Length of stream or size of lake that will be treated: 1,030 feet

E. Project Budget:

Grant Request (Dollars): $ 32,350.00

Contribution by Applicant (Dollars): $ _____ In-kind $ _____
(salaries of government employees are not considered as matching contributions)

Contribution from other Sources (Dollars): $ 18,450.60 In-kind $ 4,600.00
(attach verification - See page 2 budget template)

Total Project Cost: $ 55,400.60

F. Attach itemized (line item) budget – see template

G. Attach specific project plans, detailed sketches, plan views, photographs, maps, evidence of landowner consent, evidence of public support, and/or other information necessary to evaluate the merits of the project. If project involves water leasing or water salvage complete supplemental questionnaire (fwp.mt.gov/habitat/futurefisheries/supplement2.doc).

H. Attach land management and maintenance plans that will ensure protection of the reclaimed area.

III. PROJECT BENEFITS*

A. What species of fish will benefit from this project?:

Rainbow trout, brown trout, brook trout, kokanee salmon, burbot

B. How will the project protect or enhance wild fish habitat?:

Project will improve fish passage for migratory and resident fish populations. Migratory rainbow trout, brown trout, and kokanee salmon make spawning runs up Lake Helena tributary streams. Removal of this partial fish barrier allows access to approximately 6 miles of stream. Riffle and pool habitats are limited in the treatment section and this project will increase pool habitat in the reach by 86%. Riparian fencing and plantings will promote plant growth and provide shade to the stream.

C. Will the project improve fish populations and/or fishing? To what extent?:

Unimpeded upstream and downstream access to migratory and resident populations should increase population abundance. Improved pool habitats and riparian shading should improve refuge areas within the reach and should improve fishing within the reach, as well as areas upstream and downstream of the project reach.

D. Will the project increase public fishing opportunity for wild fish and, if so, how?:

Due to improved access to spawning habitats and increased refuge areas, the project should improve fish population abundance which in turn improves public fishing opportunity. The landowner has shown interest in maintaining the parcel as open space and enhancing public access opportunities.

E. If the project requires maintenance, what is your time commitment to this project?:

As designed, the project should require minimal annual maintenance. Water users will maintain the head gate and insure the structure is working properly. The landowner will maintain and repair the riparian fence as needed. FWP will monitor all stream treatments and take appropriate action when needed.

F. What was the cause of habitat degradation in the area of this project and how will the project correct the cause?:

Water use at the old point of diversion was sporadic over the past several years, with one water right holder consistently diverting a small amount of water for recreation use (ski lakes). Since most users on both the north (Ellis) and south (Munger) ditches rarely used water from this diversion there was no ditch rider and little annual maintenance and upkeep. Since boards were left in the diversion year around, erosion above and below the diversion deteriorated the structure to the point where only the Munger ditch could convey water. High flows in 2011 finally eroded the structure to the point where it was no longer operable. Moving the headgate upstream will allow active water users to efficiently convey water while still allowing fish passage. The old irrigation structure will be removed and the stream bed and banks will be modified to prevent head cutting and additional stream bank scouring.

Degradation on the land adjacent to the structure is largely a function of high intensity livestock grazing. Grazing has denuded the stream banks of vegetation and increased the susceptibility of the stream banks to erosion. Riparian fencing will keep livestock out of the riparian area, promoting vegetation growth. Shaping stream banks and use of tree revetments and rootwads will stabilize stream banks and promote development of scour pools.

G. What public benefits will be realized from this project?:

Improved fish passage and habitat improvements should increase fish abundance, leading to better fishing. Fish habitat improvements will also improve water quality, through sedimentation reduction, lower stream temperature, and reduce pollutants by establishing a vegetative buffer.

H. Will the project interfere with water or property rights of adjacent landowners? (explain):

There are eight water rights associated with this diversion; three on the Ellis Ditch and five on the Munger Ditch. Due to the deteriorated structure the Ellis Ditch has not been used in several years. All three water right holders on the Ellis Ditch have been informed of the proposed project and have approved our proposal to remove the deteriorated structure. One user hasn't called water from this diversion since the Helena Valley Canal was constructed in the 1950s, and has no plans to use the old Ellis Ditch. The other two users have a secondary point of diversion associated with the water right and use that secondary diversion rather than the old Ellis Ditch as the secondary point of diversion adjoins the place of use.

As proposed, the project will have the capacity to convey flows to all users on the Munger Ditch (3.75 cfs, or 1,683 gpm). Of the five water rights on the Munger Ditch, only the recreational users have been actively using the ditch (134 gpm from April 1 to September 30). A portion of one of the other water rights was sold to provide mitigation water for the Glacier Point subdivision municipal well. Place of use for the other water rights are now served by the Helena Valley Canal or have been subdivided and water cannot be conveyed to the water right owners.

This project as proposed will not interfere with property rights of adjacent landowners.

I. Will the project result in the development of commercial recreational use on the site?: (explain):

No. This parcel is adjacent to subdivided and developed property and the open lands are often used by people from the neighboring subdivisions. The parcel owner has shown interest in maintaining the parcel as open space and improving access in the future.

J. Is this project associated with the reclamation of past mining activity?:

No.

Each approved project sponsor must enter into a written agreement with the Department specifying terms and duration of the project.

IV. AUTHORIZING STATEMENT

I (we) hereby declare that the information and all statements to this application are true, complete, and accurate to the best of my (our) knowledge and that the project or activity complies with rules of the Future Fisheries Improvement Program.

Applicant Signature: _____ Date: _____

Sponsor (if applicable): _____

***Highlighted boxes will automatically expand.**

Mail To: **Montana Fish, Wildlife & Parks**
Habitat Protection Bureau
PO Box 200701
Helena, MT 59620-0701

Incomplete or late applications will be returned to applicant.

Applications may be rejected if this form is modified.

*****Applications may be submitted at anytime, but must be received by the Future Fisheries Program office in Helena <u>before</u> December 1 and June 1 of each year to be considered for the subsequent funding period.*****

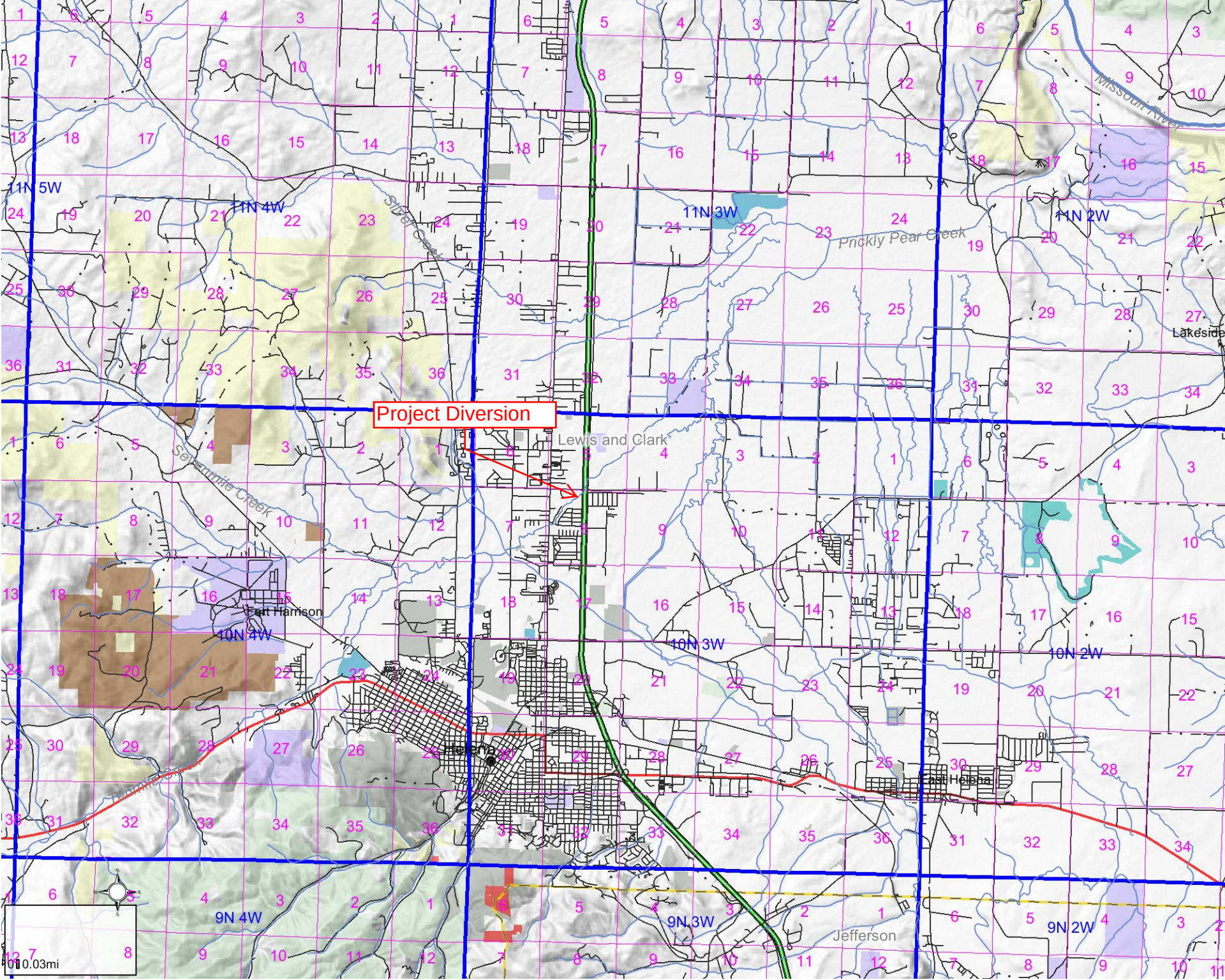
BUDGET TEMPLATE SHEET FOR FUTURE FISHERIES PROGRAM APPLICATIONS
(Revised 5/30/2013)

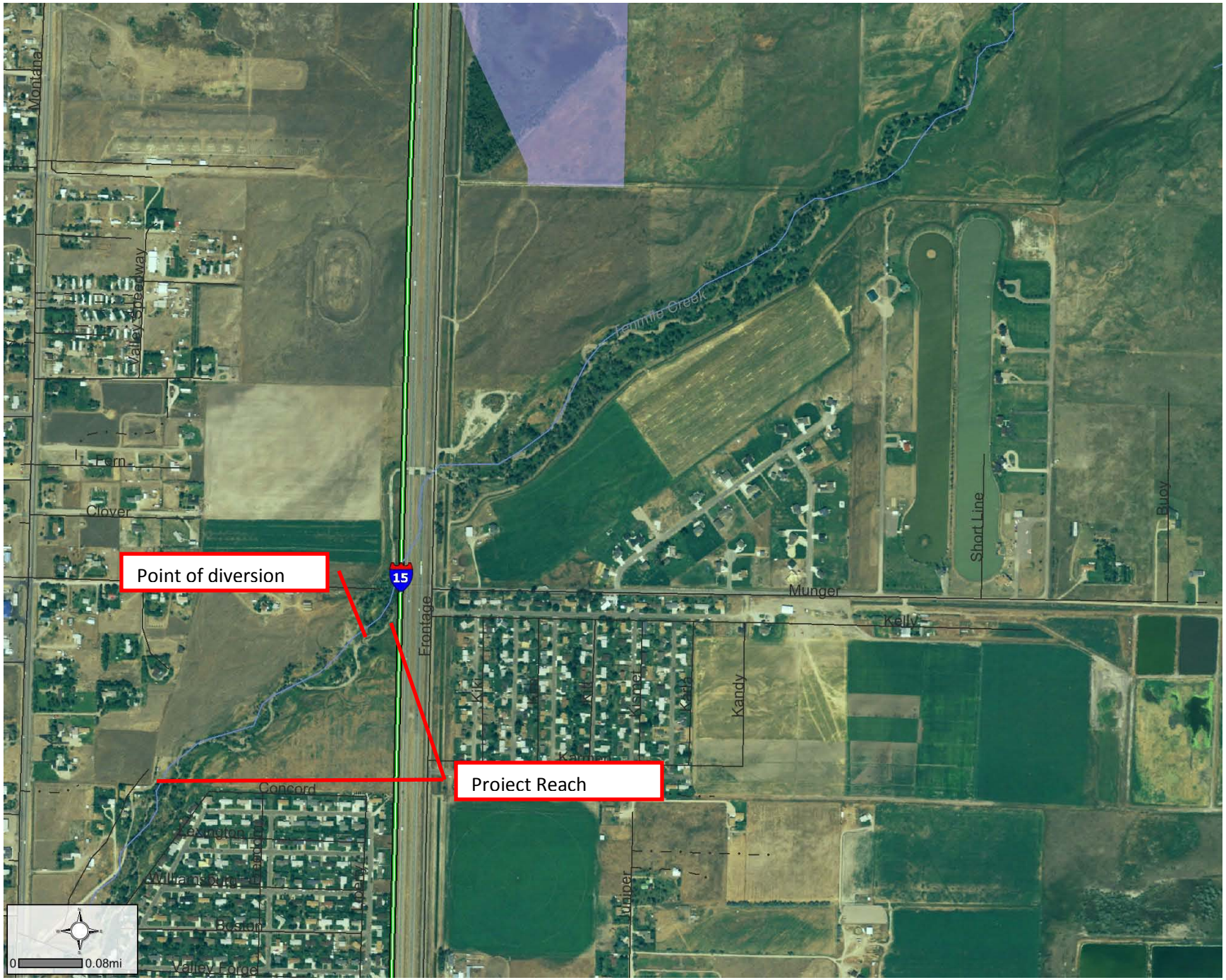
WORK ITEMS (ITEMIZE BY CATEGORY)	NUMBER OF UNITS	UNIT DESCRIPTION *	COST/UNIT	TOTAL COST	CONTRIBUTIONS			
					FUTURE FISHERIES REQUEST	IN-KIND SERVICES	IN-KIND CASH	TOTAL
Personnel								
Survey				$ 1,200.00			1,000.00	$ 1,000.00
Design				$ 800.00			1,000.00	$ 1,000.00
Engineering				$ -				$ -
Permitting				$ 200.00			200.00	$ 200.00
Oversight				$ 3,600.00			3,600.00	$ 3,600.00
Labor	40	hours	$45.00	$ 1,800.00			1,800.00	$ 1,800.00
				$ -				$ -
Travel								
Mileage				$ -				$ -
Per diem				$ -				$ -
Construction Materials								
Headgate	1	18" headgate	$1,200.00	$ 1,200.00		1,200.00		$ 1,200.00
Headwall	1	treated headwall	$1,000.00	$ 1,000.00		1,000.00		$ 1,000.00
Juniper trees	110	trees	$10.46	$ 1,150.60			1,150.60	$ 1,150.60
Cottonwood trees	12	trees	$200.00	$ 2,400.00		2,400.00		$ 2,400.00
Pit run	30	yd^3	$12.00	$ 360.00			360.00	$ 360.00
Big rock	165	yd^3	$50.00	$ 8,250.00			8,250.00	$ 8,250.00
Misc	1		$90.00	$ 90.00			90.00	$ 90.00
Fence	5,300	ft^2	$2.50	$ 13,250.00	13,250.00			$ 13,250.00
Corrigated metal pipe	20	linear feet	$45.00	$ 900.00			900.00	$ 900.00
Logs	2	logs	$50.00	$ 100.00			100.00	$ 100.00
Equipment								
Excavator	90	hours	$120.00	$ 10,800.00	10,800.00			$ 10,800.00
Skidsteer	40	hours	$80.00	$ 3,200.00	3,200.00			$ 3,200.00
Track truck	40	hours	$90.00	$ 3,600.00	3,600.00			$ 3,600.00
				$ -				$ -
				$ -				$ -
				$ -				$ -
				$ -				$ -
Mobilization								
Equipment	3	implements	$500.00	$ 1,500.00	1,500.00			$ 1,500.00
				$ -				$ -
				$ -				$ -
				$ -				$ -
				$ -				$ -
			TOTALS	$ 55,400.60	$ 32,350.00	$ 4,600.00	$ 18,450.60	$ 55,400.60

*Units = feet, hours, inches, lump sum, etc.

MATCHING CONTRIBUTIONS

CONTRIBUTOR	IN-KIND SERVICE	IN-KIND CASH	TOTAL
PPL Montana	$ -	$ 18,000.00	$ 18,000.00
Ski Lake HOA	$ -	$ 2,000.00	$ 2,000.00
Ski Lake HOA	$ 2,200.00		$ 2,200.00
Dean Bjerke	$ 2,400.00	$ -	$ 2,400.00
	$ -	$ -	$ -
	$ -	$ -	$ -
	$ -	$ -	$ -
	$ -	$ -	$ -
	$ -	$ -	$ -
	$ -	$ -	$ -


Project Diversion
Lewis and Clark
Silver Creek
Prickly Pear Creek
Missouri River
Lakeside
Fort Harrison
Helena
East Helena
Jefferson
11N 5W
11N 4W
11N 3W
11N 2W
10N 4W
10N 3W
10N 2W
9N 4W
9N 3W
9N 2W
0 10.03mi


Point of diversion
Proiect Reach
Montana
Valley Speedway
Fern
Clover
Tenmile Creek
Frontage
15
Munger
Kelly
Short Line
Buoy
Kandy
Concord
Lexington
Williamsburg
Boston
Valley Forge
Juniper
0
0.08mi

Tenmile-Bjerke Project Design Narrative

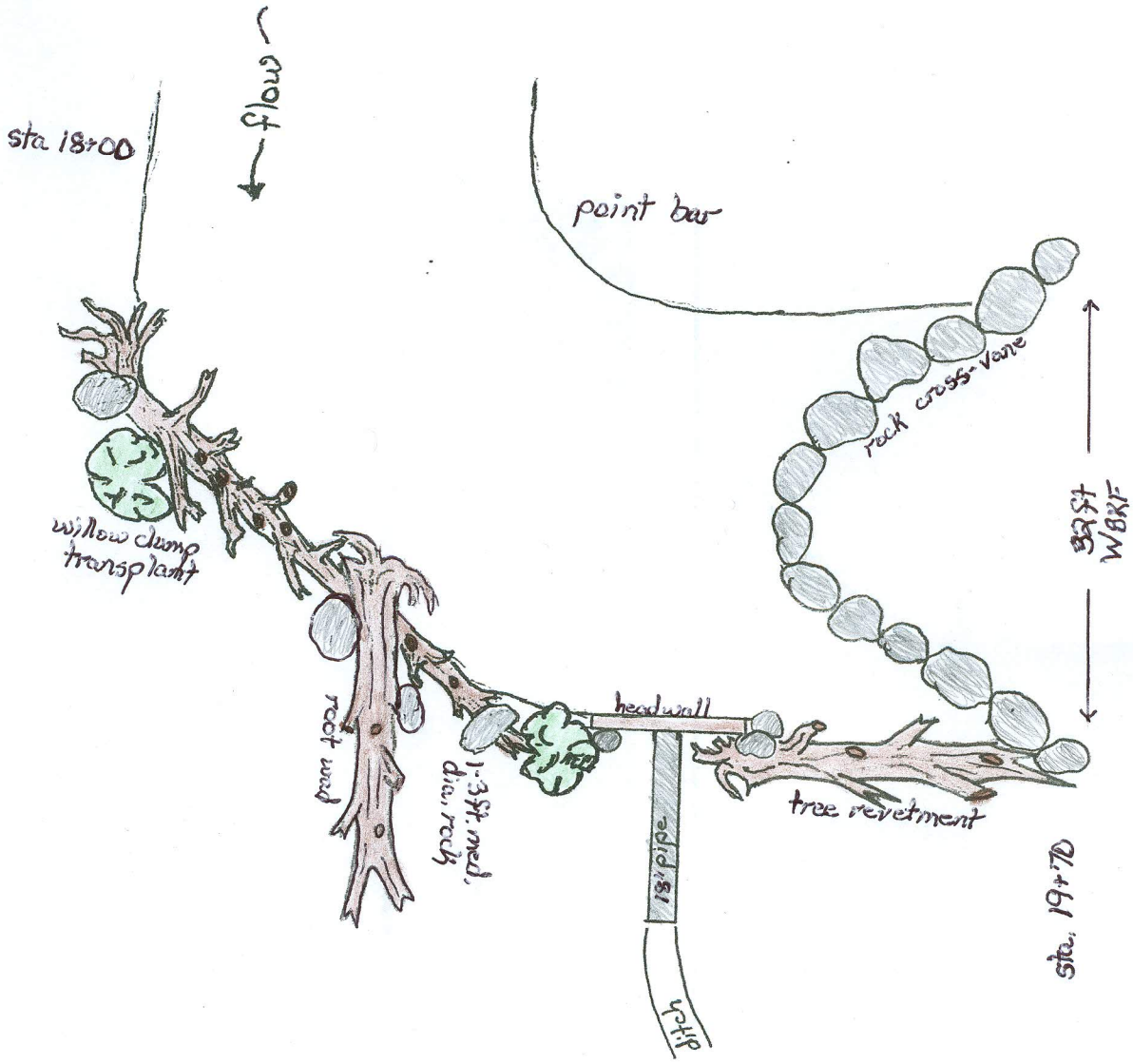
Tenmile Creek is a perennial stream with headwaters near the Continental Divide and flows approximately 27 miles before the confluence with Prickly Pear Creek approximately 2.3 miles upstream of Lake Helena. Lower Tenmile flows approximately 15 miles through the Helena valley and flows into an alluvial fan as it enters the valley. Many reaches of Tenmile go dry either through irrigation withdraws or through percolation into the groundwater. Although water flows in Tenmile have improved in recent years (largely due to decreased irrigation demands), the proposed project reach can go dry. Groundwater recharge typically improves flows below the project reach. The old irrigation diversion structure likely served as a partial fish barrier in the spring, but blocked fish passage during low fall flows.

The project area is approximately 3.5 miles upstream from the confluence with Prickly Pear Creek. Rosgen classification for the reach is a C4 type channel, which is generally defined as a low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well defined flood plains. Substrate in the project reach is primarily gravel with some cobbles (Figure 13). A specific reference reach was not used for geomorphic calculations; calculations were made based on other habitat projects that have been completed on Tenmile in the Helena valley. Calculations used for channel design are listed in the table below.

Table 1: Geomorphic calculations used for Tenmile Creek channel design.

Bankfull discharge (Q_{bkf})	230 cfs
Mean bankfull velocity (u_{bkf})	4.0 ft/sec
Bankfull cross section area (A_{bkf})	57.5 ft^2
Bankfull width (W_{bkf})	32 ft
Mean riffle depth	1.8 ft
Radius of curvature (R_c)	73 ft
Pool W_{bkf}	39 ft
Mean pool depth	5.5 ft
Stream meander length (L_m)	361-288 ft
Sinuosity (K)	1.48

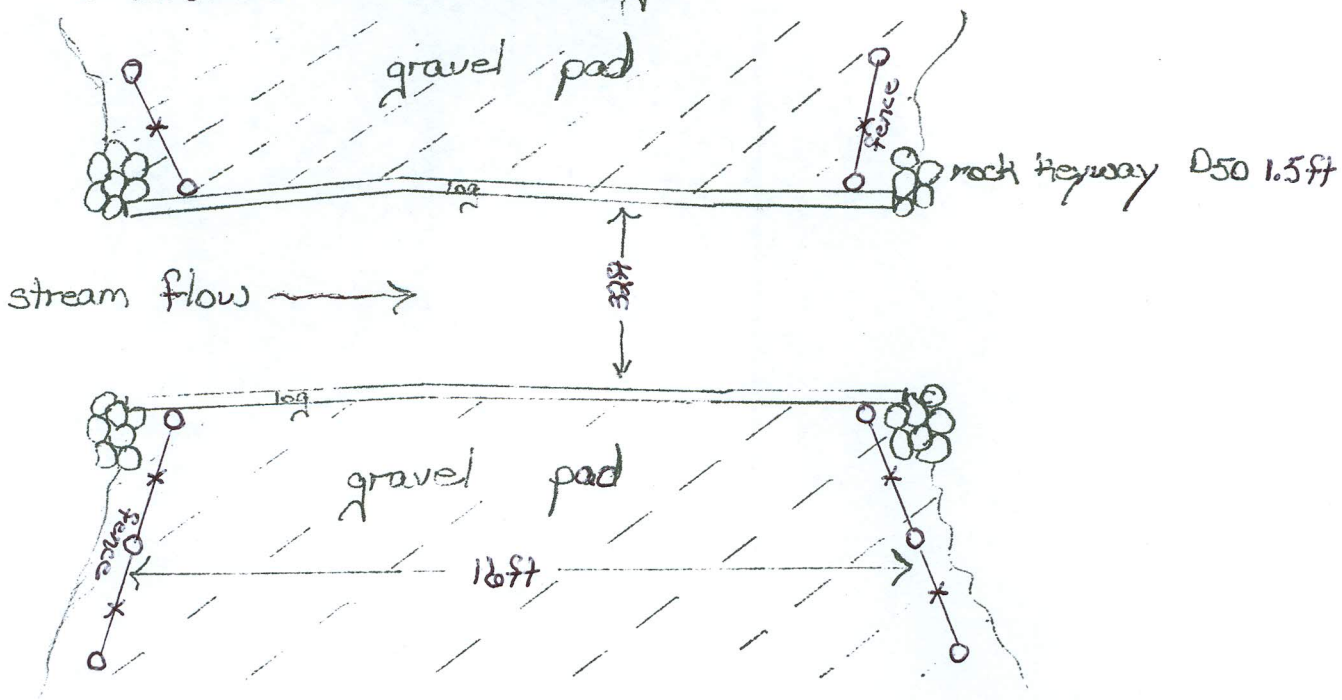
Diversion Design
Ten Mile Cr./Bjerke



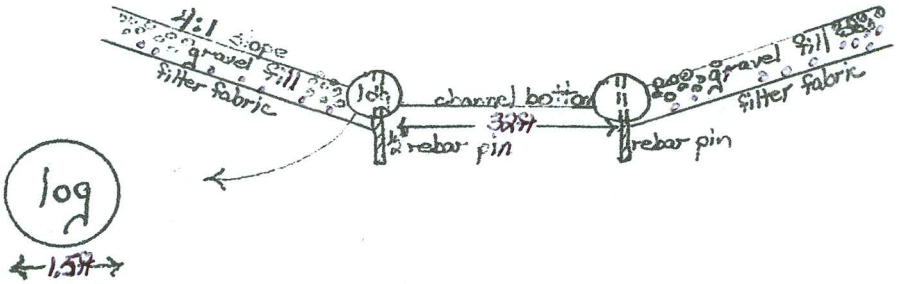
Ten Mile Cr./Bjerke
Sta. 12+50

AFM constructed livestock crossing

Plan View



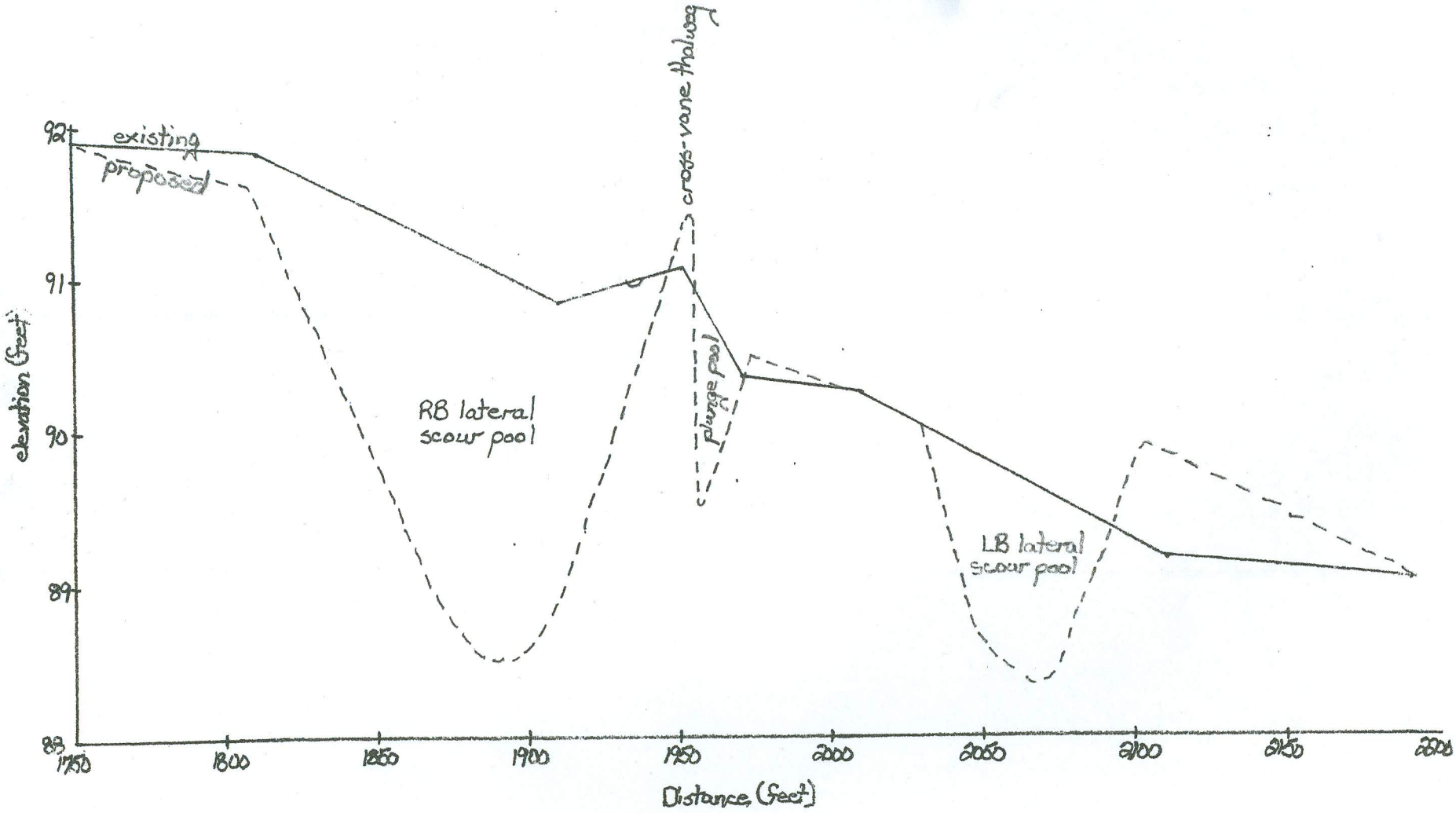
cross section



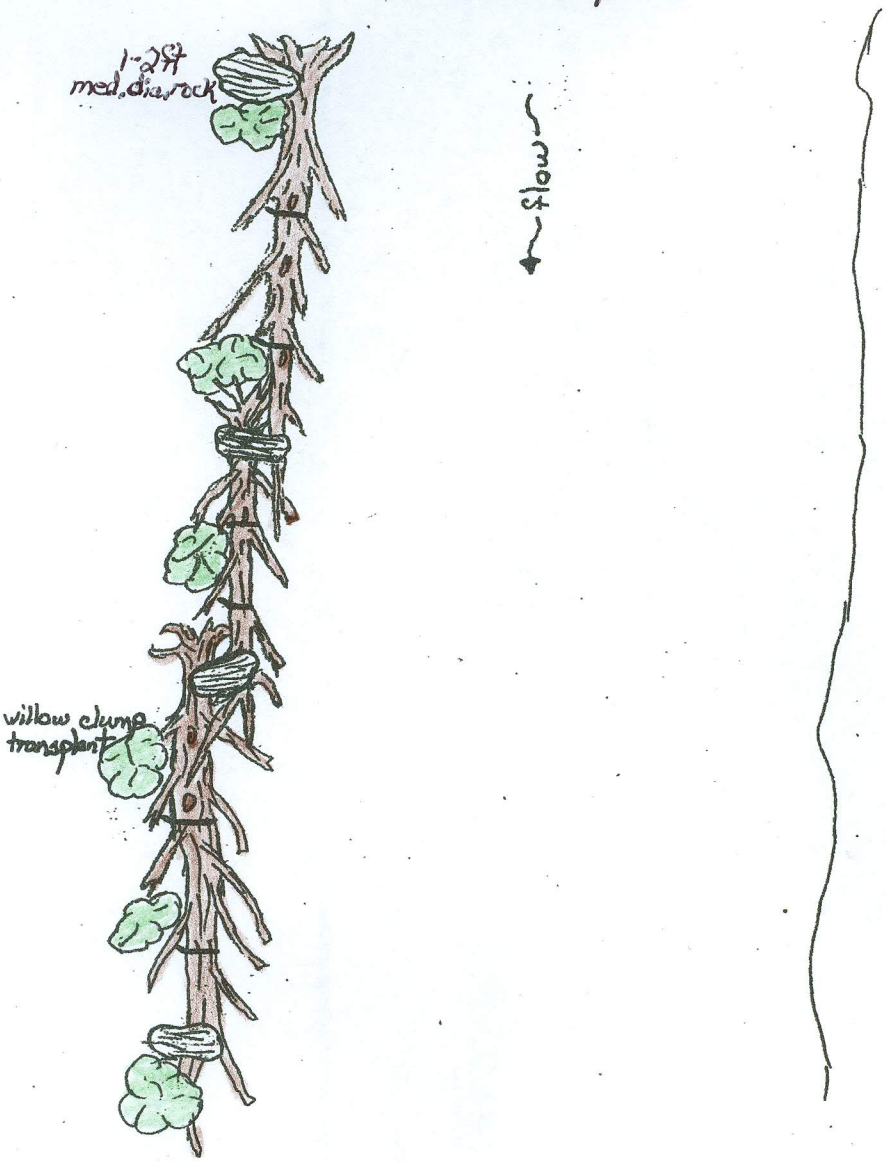
log - minimum diameter

Not to Scale

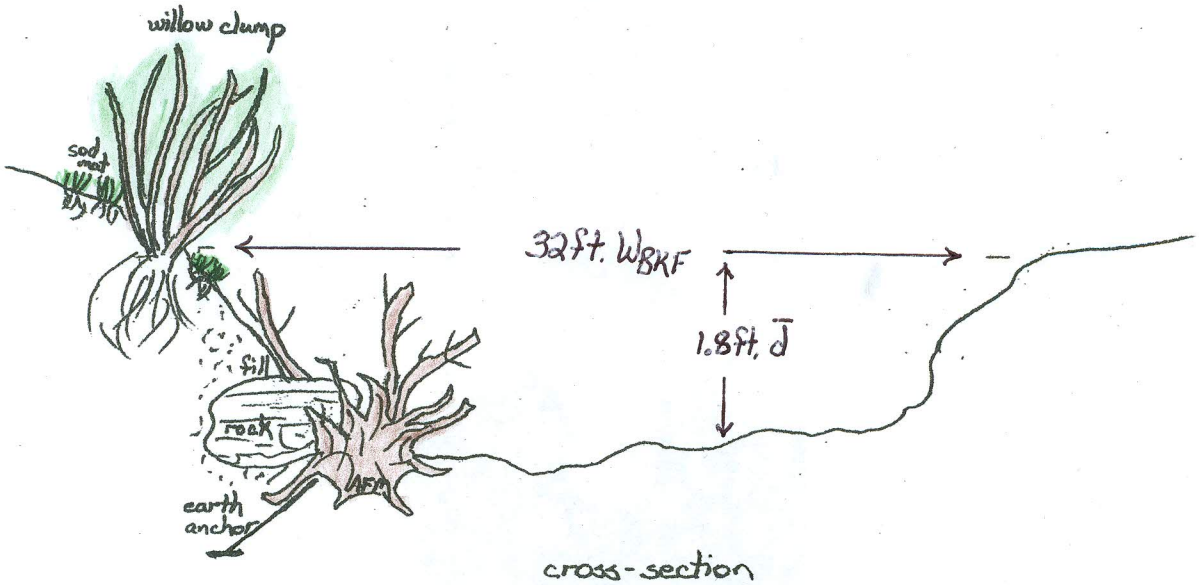
Existing and Proposed Streambed
new diversion point
Ten Mile Cr./Bjerke



Tree Revetment
Ten Mile Cr./Bjerke

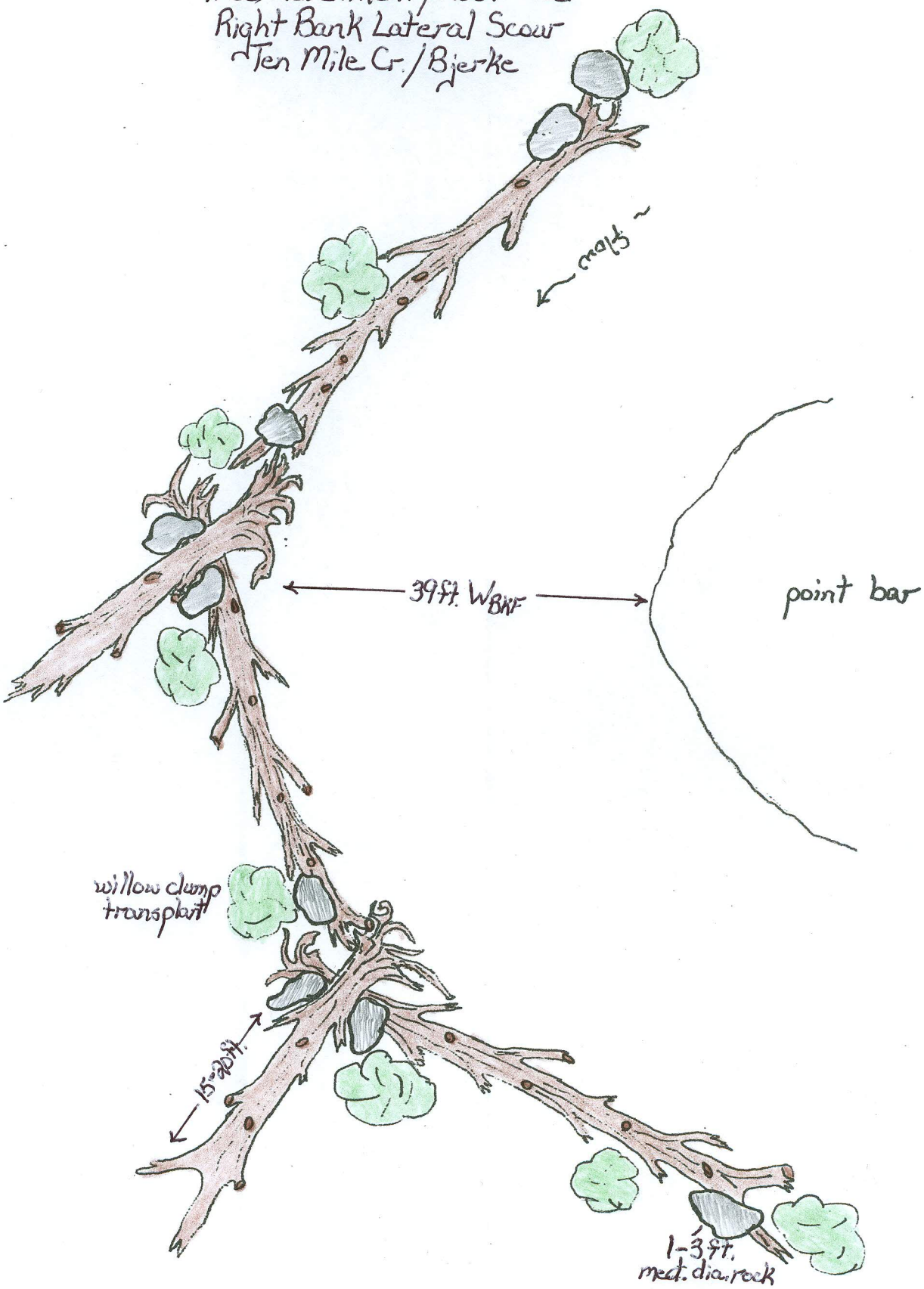


plan view

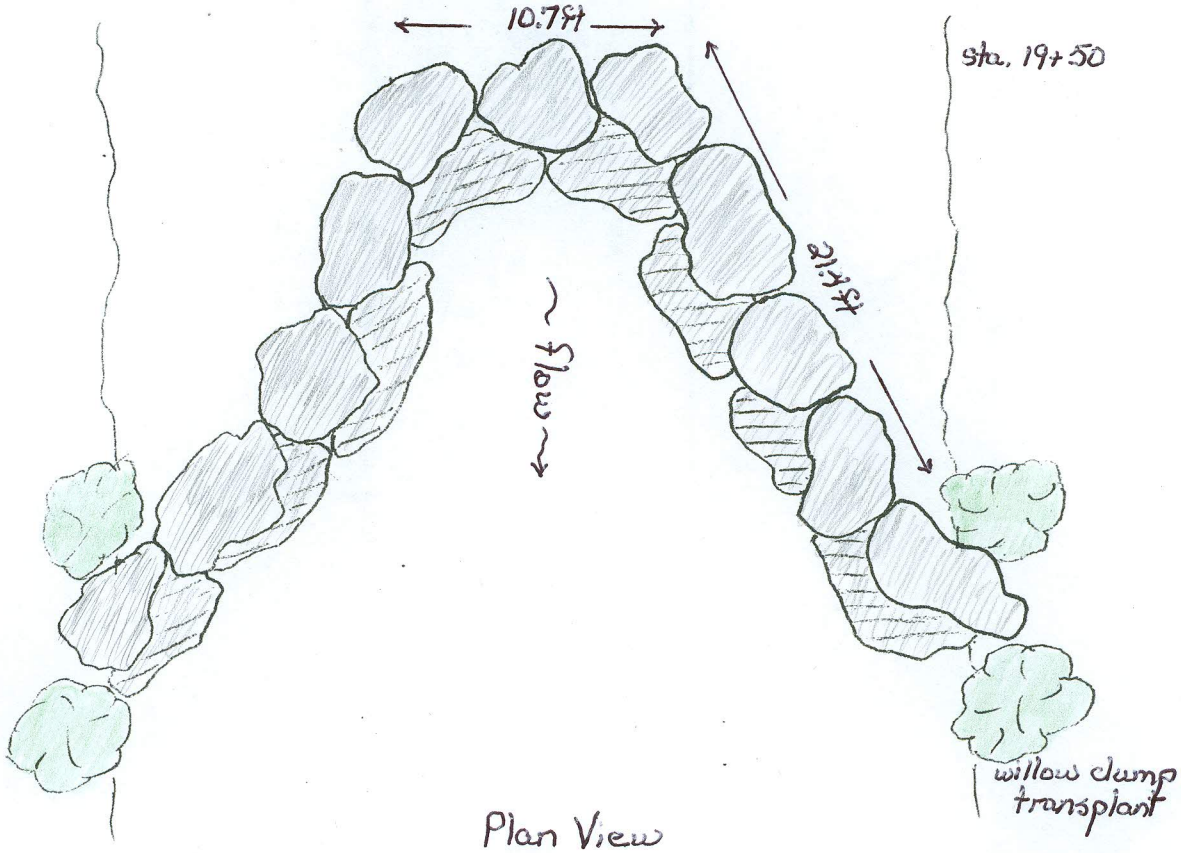


cross-section

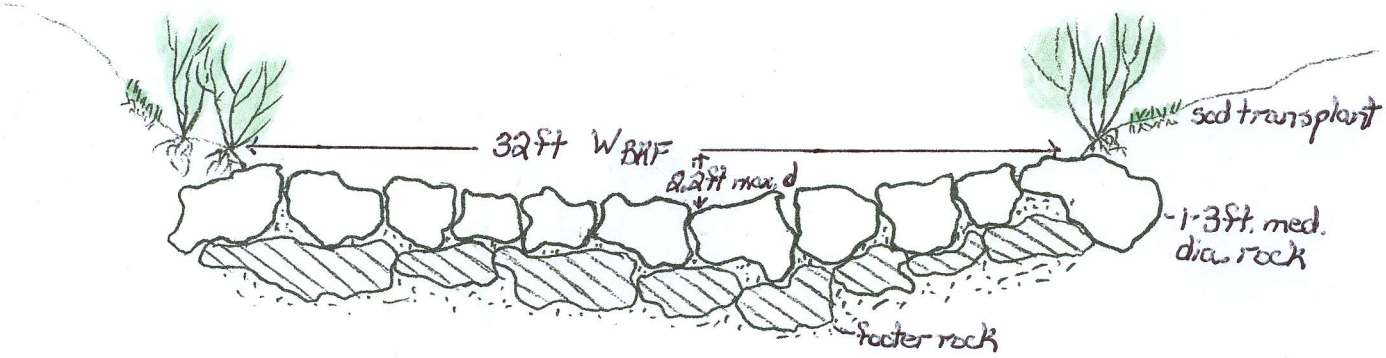
Tree Revetment/Root Wad
Right Bank Lateral Scour
Ten Mile Cr./Bjerke



Rock Cross-vane
Ten Mile Cr./Bjerke

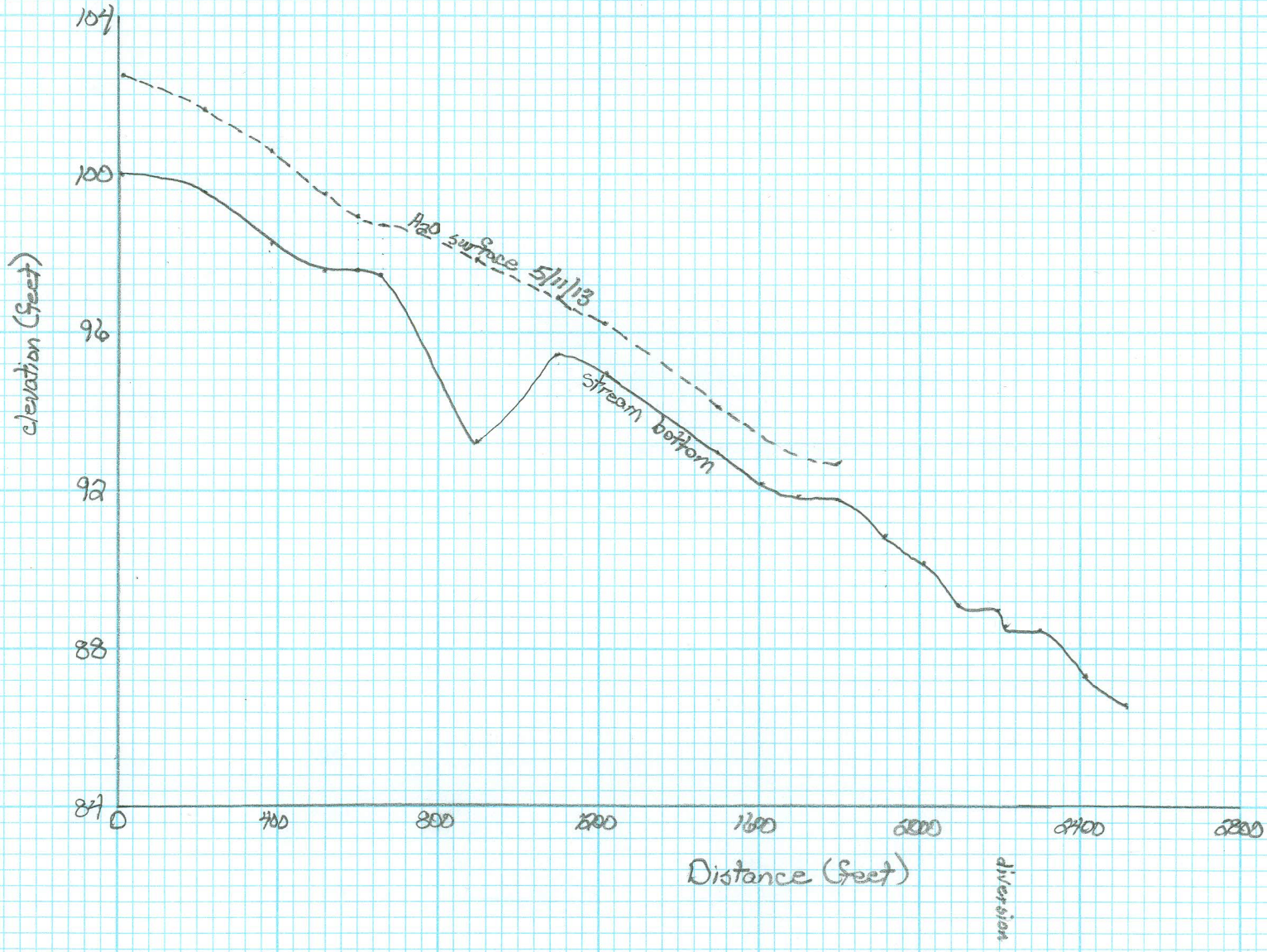


Plan View

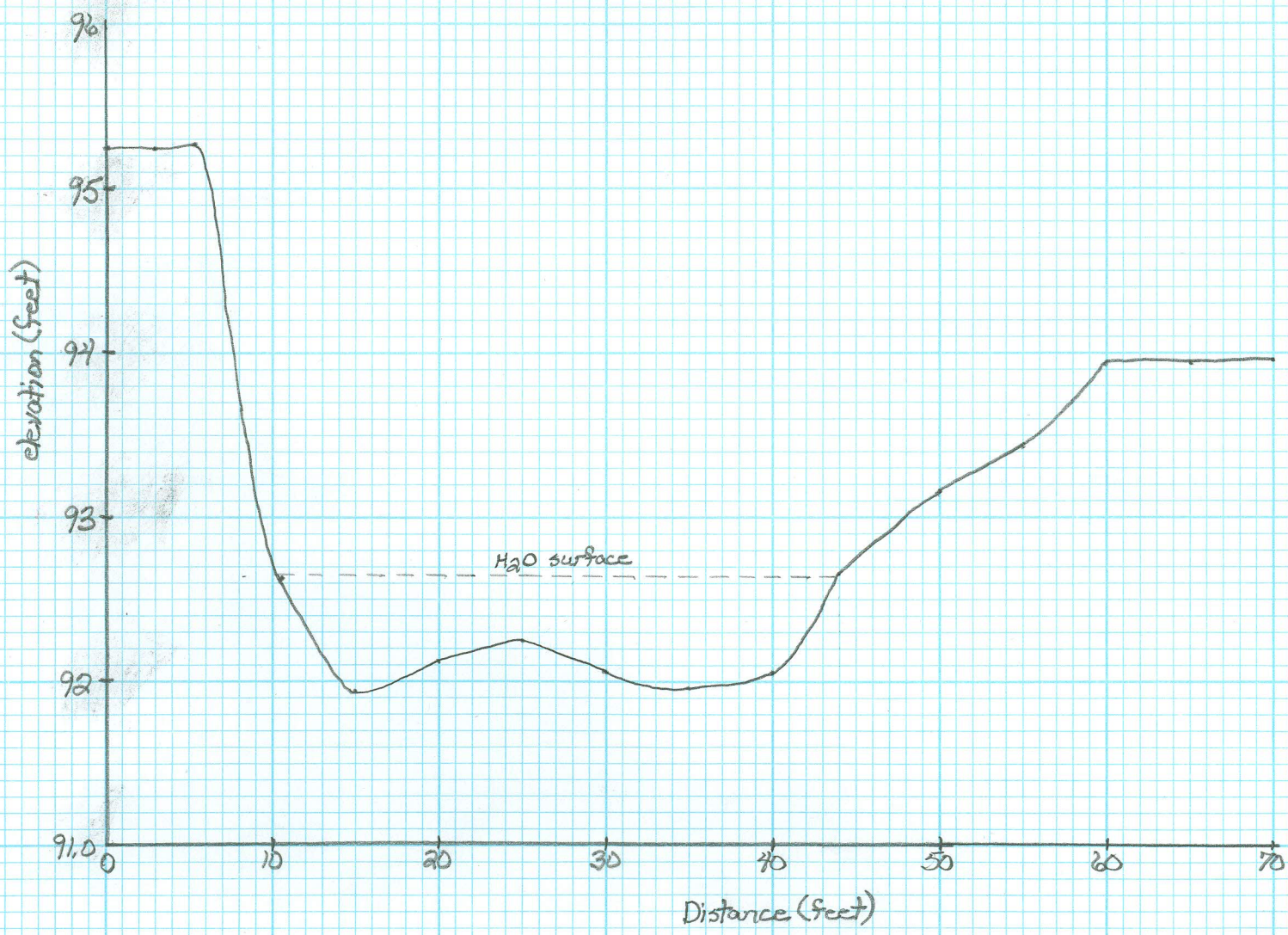


Cross-section

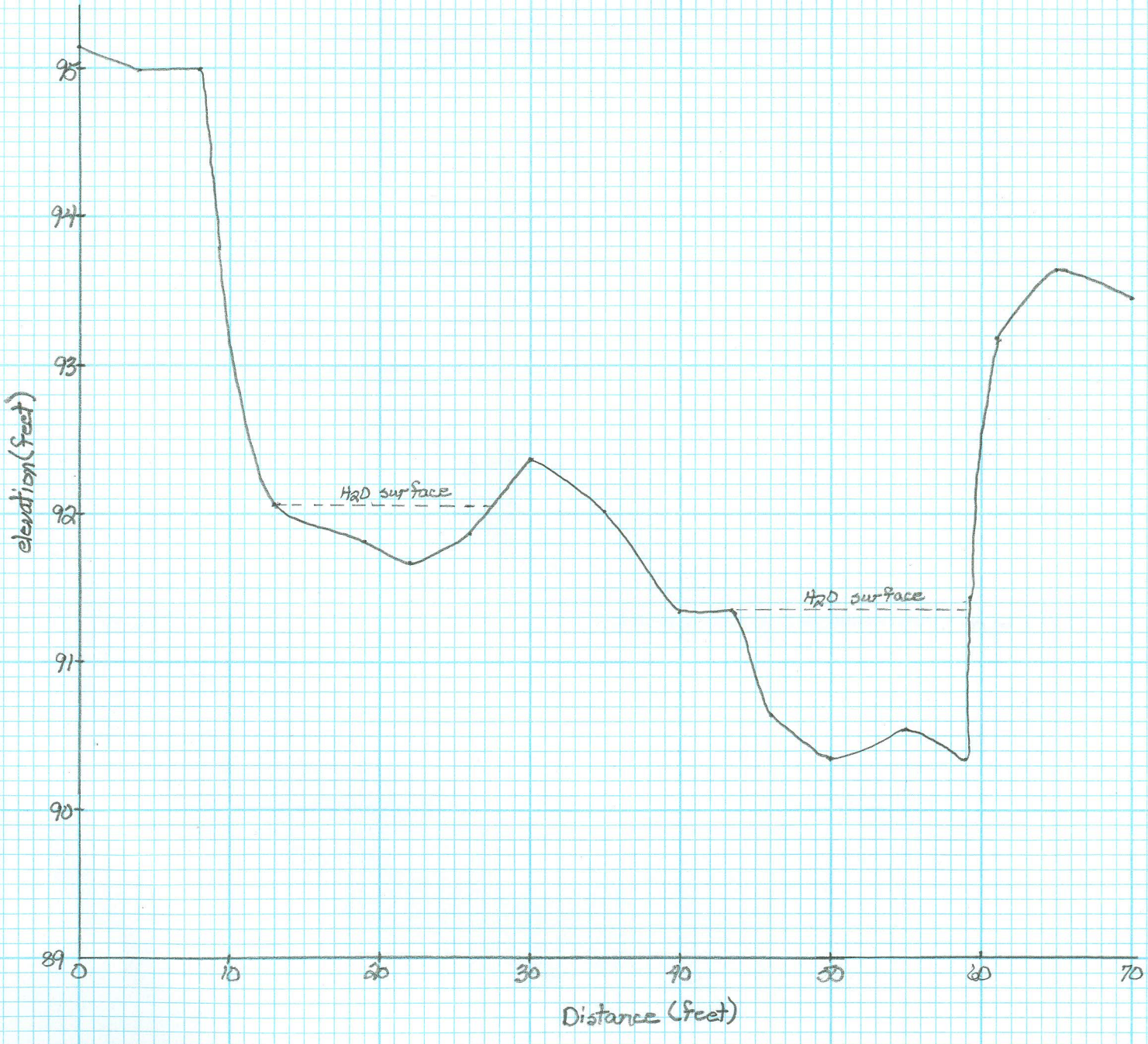
Profile
Ten Mile / Bjerke



X-S# 1
4/29/13
Ten Mile/Bjerke



XS #2
4/29/13
Ten Mile/Bjerke



Detail Sheet

Detail	Bank	Station	Treatment
Detail 1	Left	2+16 to 3+89	150 ft tree revetment, 2 root wads
Detail 2	Right	6+65 to 9+00	150 ft tree revetment, 4 root wads
Detail 3	Right	9+36 to 11+00	100 ft tree revetment
Detail 4		12+50	Livestock crossing 2 x 22 ft + 18” min diameter logs, 22 yd^3 pit run, 15 yd^3 keyway rock
Detail 5	Left	12+95 to 13+39	50 ft tree revetment
Detail 6	Left	14+12 to 15+11	100 ft tree revetment, 1 root wad
Detail 7	Right	16+00 to 20+00	300 ft tree revetment, 3 root wad
Detail 8	Left	21+00 to 21+50	80 ft tree revetment, 2 root wad
Detail 9	Right	21+90 to 23+00	100 ft tree revetment

Figure 1: Tenmile Creek at Detail 1. Proposed treatment is to return stream to appropriate radius of curvature and stabilize bank with tree revetments to prevent a meander cut-off, which would reduce stream length substantially.

Figure 2: Tenmile Creek at Detail 2. Proposed treatment is to return stream to appropriate radius of curvature and stabilize bank with tree revetments to prevent a meander cut-off.

Figure 3: Looking downstream from the point bar seen in Figure 2.

Figure 4: Looking upstream at the meander bend in Detail 2.

Figure 5: Eroding streambank at Detail 3. Proposed treatment is to place tree revetments to reduce bank erosion.

Figure 6: Proposed location for livestock crossing (Detail 4).

Figure 7: Tenmile streambank at Detail 7. Proposed treatment is to use tree revetments and root wads to reduce bank erosion and provide fish habitat.

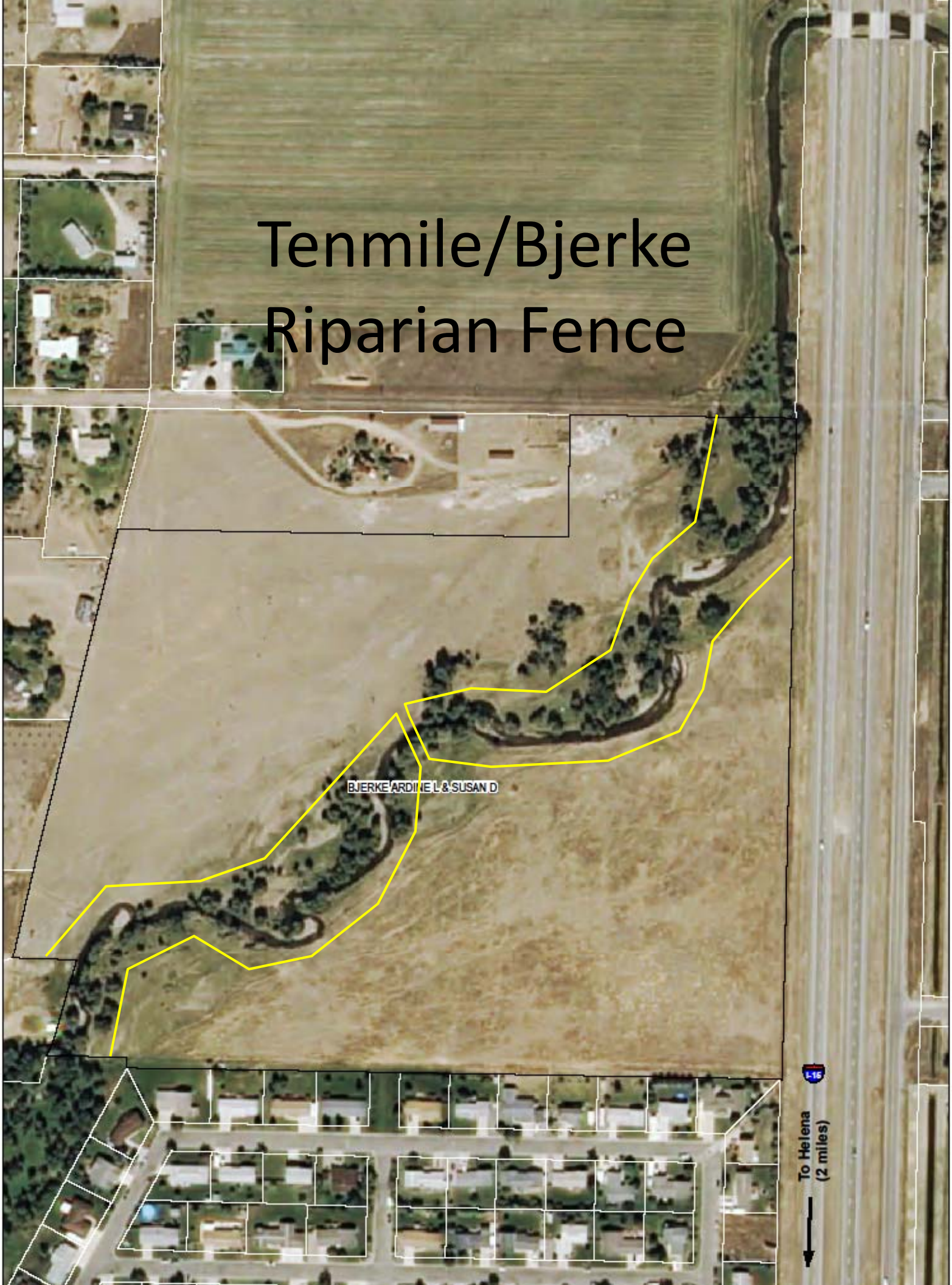
Figure 8: Bottom end of Detail 7, where new headwall and headgate for Munger Ditch will be placed. Rock cross vane would be placed on the left side of the picture.

Figure 9: Looking upstream just below where proposed rock vane will be placed.

Figure 10: Looking downstream at Detail 8, just above the old diversion. Proposed treatment is to use tree revetments and root wad to reduce erosion and provide fish habitat.

Figure 11: Looking downstream at the old diversion and Detail 9. Proposed treatment is to remove the old diversion and if needed, take measures to prevent head cutting following removal. Proposed treatment at Detail 9 is to place tree revetments to reduce erosion.

Figure 12: Looking upstream at the old irrigation diversion.

Figure 13: Typical substrate sample from the project reach.

Tenmile/Bjerke Riparian Fence