Watershed Restoration Plan

for

Lower Clark Fork Tributary TMDL Planning Area

August 16, 2010

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Lower Clark Fork Watershed Group

Doc. No. 2010-0453

Introduction

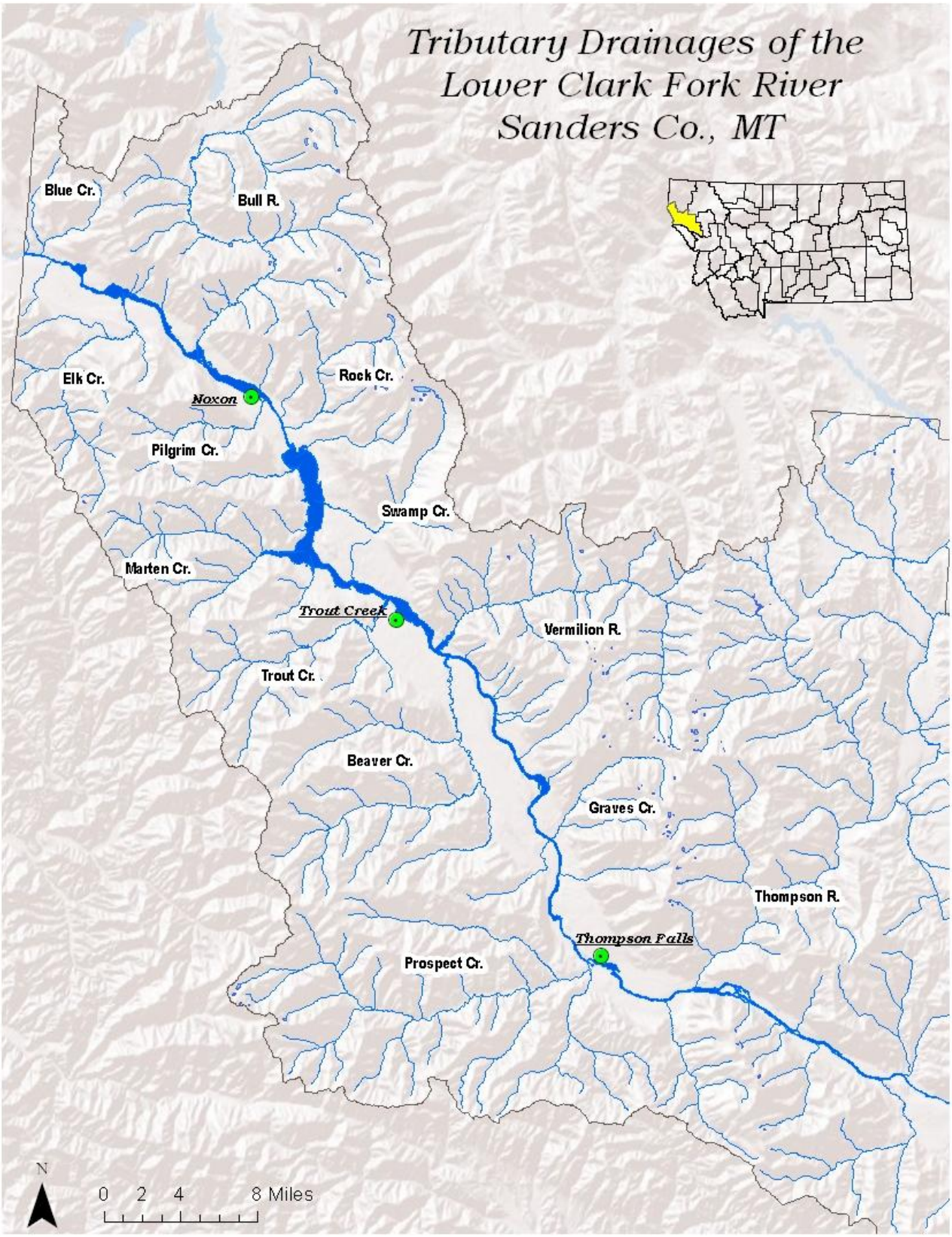
Green Mountain Conservation District (GMCD) has taken the lead in organizing and supporting watershed councils across the lower Clark Fork watershed for well over a decade. GMCD's mission is to protect and enhance the natural resources of the district and to educate the public about natural resource concerns. The Lower Clark Fork Watershed Group (LCFWG) formed in early 2003 to serve as an "umbrella" organization for the watershed councils that were formed to protect the water resources of key tributaries to the lower Clark Fork River. The intent of the LCFWG is to carry out a systematic, coordinated river ecosystem approach to watershed management and to maximize collaborative, administrative, technical and financial resources along the lower Clark Fork River. While each of the eight watershed councils (Elk Creek, Prospect Creek, Rock Creek, Whitepine Creek, Bull River, Trout Creek, Pilgrim Creek, and Little Beaver Creek) functions as its own entity, the councils are combining their collaborative efforts and making best use of available technical, financial and agency resources through participation in the LCFWG. With strong community support, each council is assisted by a watershed coordinator and Technical Advisory Committee (TAC) to develop and undertake projects, including watershed assessments, and other on-the-ground stream restoration and water quality improvement work, negotiate and oversee contracts, and evaluate monitoring data to determine project results. These projects have been made possible through cooperation and funding from a wide array of federal and state agencies, corporations and other entities, including US Environmental Protection Agency, US Forest Service/Kootenai and Lolo National Forests, Natural Resources Conservation Service, US Fish and Wildlife Service, Montana Department of Environmental Quality, Montana Department of Natural Resources and Conservation, Montana Fish, Wildlife and Parks, Avista Corporation, and various foundations. This cooperative effort continues with the goal of accurately identifying and mitigating the sources contributing to the impairment of all waterbodies in the LCFWG project area, including all tributaries of the Clark Fork River from Thompson Falls downstream to the Idaho border. A map showing tributary drainages in the LCF project area is included (Exhibit 1) on the following page.

There are ten waterbodies in the LCF planning area listed on the 2006 Montana 303(d) list for sediment impacts and habitat limitations including Prospect Creek, Antimony Creek, Cox Gulch, Clear Creek, Dry Creek (all in the Prospect drainage), Bull River, Dry Creek (Bull River drainage), Marten Creek, Whitepine Creek and Swamp Creek. There are currently seven lower Clark Fork tributaries listed for sediment impacts and habitat limitations on the 2008 Montana 303(d) list including: Cox Gulch, Clear Creek, Bull River, Dry Creek (Bull River drainage), Marten Creek, Whitepine and Swamp Creek. Other tributaries have not been listed, but may warrant listing. Water quality improvement projects proposed by interested parties are not restricted to the 303(d) listed waterbodies. There are dozens of potential water quality improvement projects on waterbodies located throughout the lower Clark Fork. If significant water quality and/or fish habitat improvements can be made on any tributary, and if funding can be obtained, that project has a reasonable chance for implementation.

The LCFWG and GMCD understand the need to have a watershed restoration plan (WRP) in place that contains USEPA's nine minimum elements for a watershed plan (see Attachment A). Various pieces of information have been developed over the past decade or so that can be utilized to develop a WRP, but it is expected that additional efforts will be needed to further develop this plan to fully meet USEPA and MDEQ guidelines. The stakeholders of the LCF will continue to participate in the implementation of the LCF TMDLs and a fully functional WRP.

The primary sources of information utilized to address the nine elements of a Watershed-based Restoration Plan include the references listed in Attachment B.

EXHIBIT 1


Tributary Drainages of the
Lower Clark Fork River
Sanders Co., MT
Blue Cr.
Bull R.
Elk Cr.
Noxon
Rock Cr.
Pilgrim Cr.
Swamp Cr.
Marten Cr.
Trout Creek
Vermilion R.
Trout Cr.
Beaver Cr.
Graves Cr.
Thompson R.
Thompson Falls
Prospect Cr.
N
0 2 4 8 Miles

Nine Elements of a Watershed-based Restoration Plan (WRP)

1. ***Causes and sources of non-point source pollution.***

Response: Causes and sources of water body impairments in the LCF are the result of development throughout the watersheds, mainly along stream corridors and valley bottoms (land clearing for farms and houses, creation of pasture and grazing land and timber harvest), legacy logging in riparian areas, historic and current resource extraction/mining, fire events, infrastructure (roads and utilities). Sediment is the major pollutant of concern in the LCF and a number of significant sediment sources have been identified including stream bank erosion, surface erosion from roads, potential culvert failure, and timber harvest. Streams that are not on the 303(d) list, but are still considered impaired are also treated e.g., Vermilion River, Tuscor Creek, Little Beaver Creek. Bank erosion to anthropogenic influences is likely the largest contributor of sediment in the LCF watershed. Although the LCF area is rural with a low population density, there is also concern for impacts due to septic systems and large developments, especially since Sanders County has limited planning regulations.

Causes and sources of sediment that need to be controlled to achieve load reductions are addressed in two ways. 1) Specific sites in many LCF drainages are identified in individual watershed assessments (see Attachment B, which includes all watershed assessments completed to date). For example, the Vermilion River Watershed Assessment and Preliminary Restoration Plan, analyzed current hydrologic, geomorphic, vegetative, sediment and fisheries conditions and prioritized restoration projects in the Vermilion drainage. The assessment characterized the Chapel Slide site (an eroding mass waste that delivers approximately 700 tons per year of fine sediment (under average flood conditions) into a high priority fish spawning area just below Vermilion Falls) as the largest known sediment source in the entire watershed and rated it the highest priority for restoration. Other assessments contain similar information of restoration sites that have been identified. **2)** Causes and sources of impairment are also identified in the following documents:

a) Prospect Creek Watershed Sediment TMDLs and Framework for Water Quality Restoration (refer to Section 5.0 – Source Assessment and Sediment Quantification).

b) Total Maximum Daily Loads For Metals In Prospect Creek Watershed, Sanders County, Montana (refer to Section 3.0 – Data Compilation).

c) Lower Clark Fork River Tributaries Sediment TMDLs and Framework for Water Quality Restoration[1] (refer to Section 5.0 – Sediment TMDL Components).

2. ***TMDL load reductions expected for the management measures to be implemented.***

Response: Sediment load reduction is accomplished by various means including stream restoration, bank stabilization, riparian revegetation, road obliteration, and standard best management practices.

[1] The LCF Sediment TMDL will likely also address the causes and sources component. The draft report is scheduled to be completed in summer 2010 and submitted to USEPA by the end of 2010. Item c may need to be revised after checking the completed document.

Estimates of load reductions expected for management measures that need to be implemented are provided typically in four ways, including: 1) watershed assessments, 2) project design plans and associated reports, 3) monitoring reports, and 4) in TMDL documents. Examples of the four types of load reduction estimates follow:

- In the Blue Creek Watershed Assessment and Restoration Prioritization Plan, expected benefits to water quality as a result of stabilizing a sediment source identified as Priority #3 (Eroding Lacustrine Hillslope, EFBC Reach 2) are estimated to be reduced by approximately 37.6 tons per year.

- In the preliminary design plan for the Springer project on East Fork Elk Creek the consultant provided an estimate for annual pre-treatment sediment erosion rates (56.0 tons per year) and an estimate that the proposed restoration project will result in a net reduction in sediment yield of 48.6 tons per year of sediment resulting from streambank erosion related sources at this site.

- Monitoring for completed restoration projects also provides similar information. In an example of post-runoff monitoring for the East Fork Elk Creek (Platt) project, the consultant estimated pre-treatment sediment yield at these sites of 60.5 tons/year. Treatment of the three project sites resulted in sediment reductions totaling 46.8 tons/year.

- The LCF TMDL documents also provide estimates of expected load reductions as follows:

    a) Prospect Creek Watershed Sediment TMDLs and Framework for Water Quality Restoration (refer to Section 5.0 – Source Assessment and Sediment Quantification).

    b) Total Maximum Daily Loads For Metals In Prospect Creek Watershed, Sanders County, Montana (refer to Section 3.0 – Data Compilation).

    c) Lower Clark Fork River Tributaries Sediment TMDLs and Framework for Water Quality Restoration[2] (refer to Section 5.0 – Sediment TMDL Components).

3. ***Management measures to be implemented to achieve load reductions.***

Response: Descriptions of the NPS management measures that will need to be implemented to achieve the load reductions estimated under item (2) above are typically provided in watershed assessments and TMDL documents. The LCFWG TAC has reviewed all watershed assessment restoration recommendations and has prioritized potential restoration projects by drainage. These rankings are based project impact and feasibility, magnitude of sediment contribution, land owner participation, and cost of restoration. The LCF Watershed Restoration Recommendations – Prioritization/Ranking List is attached (Attachment C). Most of the restoration work in the LCF over the past decade has been aimed at sediment reduction and fish habitat improvement and such work will likely continue into the next decade.

[2] The LCF Sediment TMDL will likely also address the load reductions component. The draft report is scheduled to be completed in fall 2010 and submitted to USEPA by the end of 2010. Item c may need to be revised after checking the completed document.

Several typical examples of the NPS management measures that will need to be implemented to achieve the load reductions include the following:

a) The Pilgrim Creek Watershed Assessment and Conceptual Design Report describes stream restoration strategies in detail and prioritizes fourteen sites, and provides cost estimates for implementation (refer to Section 4.0 – Restoration Strategy). Restoration sites, sediment sources and prioritized sites are also located on maps provided in the assessment (refer to Attachment A).

b) The Final Prospect Creek Watershed Assessment and Water Quality Restoration Plan provides site-specific recommendations and cost estimates for improving stream corridor conditions including passive and active restoration techniques for sites located throughout the drainage, with sites on the mainstem and major tributaries discussed (refer to Section 5 – Water Quality Restoration Plan). Restoration sites are also located on aerial photographs provided in the assessment (refer to Attachment B).

c. The Graves Creek Watershed Assessment and Conceptual Design Report provides a departure analysis, describes conceptual restoration plans for prioritized sites and provides cost estimates for implementing the restoration plan (refer to Section 4.0 – Watershed Restoration Plan). Restoration sites, sediment sources and prioritized sites are also located on maps provided in the assessment (refer to Attachment A).

d. The Prospect Creek Watershed Sediment TMDLs and Framework for Water Quality Restoration (refer to Section 8.0 – Water Quality Restoration Plan Implementation Strategy) describes both: 1) watershed-wide management activities to promote overall upland and stream health, and 2) targeted strategies to address observed impairments on mainstem Prospect Creek and major tributary streams. Restoration strategies are prioritized based on site constraints, cost, environmental benefit and feasibility.

It should also be noted that restoration projects proposed for Avista funding are annually ranked and approved by members of the Aquatic Implementation Team (represented by Avista, Montana Fish, Wildlife and Parks, Idaho Department of Fish and Game and US Fish and Wildlife Service) and interested Management Committee members. Ranking is accomplished via review of ten criteria, mainly related to fish habitat enhancement. A copy of these approval and ranking criteria are attached (Attachment D).

4. ***Technical and financial assistance.***

Response: A wide range of technical assistance and funding sources will be used to implement this WRP. Each management measure or restoration project generally calls for a different approach, but all projects sponsored by either GMCD, LCFWG or one of the associated agencies, are reviewed and approved by the TAC for that project area. Every significant water quality improvement project in the drainage is reviewed prior to actively pursuing funding for the project, and again prior to implementation. Technical assistance is provided routinely by Montana Fish, Wildlife and Parks, US Forest Service, Natural Resources Conservation Service and Avista Corporation. In certain cases, US Fish and Wildlife Service, Montana Department of Environmental Quality, Montana Department of

Natural Resources and Conservation, and US Army Corps of Engineers may also provide technical assistance.

The LCFWG TAC also developed a Watershed Assessment and Restoration Work Procedure in 2002 to guide the selection of consultants and contractors, and assist in preparation of watershed assessments, restoration work planning and project construction. These procedures are followed for all projects.

Funding for implementation of projects is obtained from a variety of federal, state and local sources, and is pursued primarily by a Grant Writer funded by Avista Utilities to assist the LCFWG and GMCD in obtaining funding for water quality improvement projects in the LCF. Financial assistance is also provided by donations of time and materials by various agencies, watershed landowners and other stakeholders. A partial list of funding sources utilized in the past ten years includes:

1. 319 Grant funding from MDEQ
2. MFWP - Future Fisheries Improvement Program
3. Various types of funding from the USFS including: RAC (Secure Rural Schools and Community Self-Determination Act of 2000) and USFS Partnership Grant
4. National Fish and Wildlife Foundation
5. Various types of funding from the USFWS including: National Fish Habitat Action Plan and Private Stewardship Grant Program
6. Avista Corporation
7. Montana Trout Foundation
8. Montana Community Foundation
9. Various types of funding from the DNRC including: Watershed Planning Assistance Grant Program, Renewable Resource Grant and Loan Program, Reclamation and Development Grant Program
10. Various types of funding from the NRCS including: Wildlife Habitat Incentive Program and Environmental Quality Incentives Program
11. Norcross Wildlife Foundation
12. Revett Minerals
13. National Forest Foundation
14. Cinnabar Foundation
15. MACD Local Empowerment Program
16. Landowner cash and in-kind donations

It is difficult to provide an estimate for the total costs associated with all the water quality and fish habitat improvement projects that should be completed to ensure the tributaries function with minimal impairment, but it is surely in the multi-million dollar range. These projects will take many years to complete. The groups and agencies proposing the water quality improvement projects do not feel that obtaining funding is a limiting factor. For example, Avista is obligated to provide several hundred thousand dollars in funding every year for the next 35 years for fish habitat improvement projects. Some portion of this funding is usually available for projects that also provide water quality improvements. In addition to directly supporting on-the-ground projects, Avista funds provide an extremely important source of non-federal match for a variety of grant programs. The LCFWG feels confident that other federal, state and private funding sources will continue to be available for water quality improvement work. It should be noted that Avista Corporation also funds a significant portion of the coordination services for the LCFWG and individual watershed council related expenses.

5. ***Public information/education.***

Response: There are opportunities for stakeholder input and public comment throughout all stages and aspects of water quality restoration planning and implementation in the LCF. Stakeholder involvement is a key component of all water quality improvement efforts, and input from local landowners, watershed residents, watershed groups, LCFWG TAC, and state and federal agency representatives is always sought.

The LCFWG and GMCD take the lead in enhancing public understanding of water quality improvement projects in a number of ways. The LCFWG meets quarterly and distributes detailed meeting summaries to all interested parties. The group has a website to keep the public informed on its activities and projects. The LCFWG holds annual tours of restoration projects and periodically sponsors workshops related to stream restoration practices, BMPs and other tools to improve water quality. Recently, the LCFWG, with the cooperation and funding of MDEQ, sponsored a symposium on stream restoration techniques in northwest Montana. This symposium was attended by more than 130 stream restoration professionals and was well received. The LCFWG is discussing the possibility of holding a similar symposium in a year or two. GMCD sponsors an annual Watershed Festival, periodically holds workshops for realtors, and sponsors area high school students at the Montana Envirothon and similar competitions.

The Lower Clark Fork River Tributaries Sediment TMDLs and Framework for Water Quality Restoration[3] also generally addresses public involvement in the TMDL process.

6. ***Schedule for implementing the NPS management measures.***

Response: The Prospect Creek Watershed Sediment TMDLs and Framework for Water Quality Restoration (refer to Section 8.0 – Water Quality Restoration Plan Implementation Strategy) states that, "It is not unrealistic to assume the components outlined in this Water Quality and Habitat Restoration Plan will require more than 10 years to fully implement, in addition to on-going monitoring and adaptive management strategies."

Given the scope of work involved with implementing the NPS management measures on all the LCF tributaries, it is estimated that full implementation of a majority of the prescribed management measures will not be completed for twenty years (in 2030). Many of the problems within the LCF drainages are historical in nature, so it will likely take generations to completely recover.

For over a decade numerous water quality improvement projects have been completed each year within the LCF project area. To provide an understanding of these efforts, a list of most of the projects completed from 1997 through 2010 is provided in Attachment E of this document.

[3] The LCF Sediment TMDL will likely also address the public information/education component. The draft report is scheduled to be completed in summer 2010 and submitted to USEPA by the end of 2010. Paragraph 3 of the public information/education section will need to be revised after checking the completed document.

7. *Measurable milestones for attaining water quality standards.*

Response: A determination of whether NPS management measures or other actions are being implemented and are effective will be accomplished by review of 1) water quality improvement project implementation, and 2) measurement of actual water quality parameters. Attaining water quality standards in the LCF project area will require cooperating by all stakeholders in order to implement the necessary pollution control measures, and the LCFWG will lead these efforts, but there will be assistance from associated watershed partners and stakeholders described in the Introduction.

It is expected there will be a five year review of the LCF Sediment TMDL in approximately 2015 and 2020, and it is proposed that at those times major efforts will be implemented to determine the status of water quality improvement efforts in the LCF and water quality standards. The focus of water quality improvement efforts can be modified based on the results of these reviews. Monitoring efforts, as described in Element 9, will provide information on whether water quality standards are being met.

8. *Criteria to determine if pollutant loading reductions are being achieved.*

Response: Descriptions of existing conditions and desired targets that will enable evaluation of whether significant progress is being made toward improved water quality conditions are discussed in the following reports:

a. Prospect Creek Watershed Sediment TMDLs and Framework for Water Quality Restoration presents guidance on development of more detailed and specific efforts related to monitoring (refer to Section 6.0 – TMDLs & Load Allocations).

b. Total Maximum Daily Loads For Metals In Prospect Creek Watershed, Sanders County Montana (refer to Section 4.0 – Targets, TMDLs, and Allocations).

c) Lower Clark Fork River Tributaries Sediment TMDLs and Framework for Water Quality Restoration[4] (refer to Section 5.0 – Sediment TMDL Components).

9. *Monitoring.*

Response: The LCFWG and GMCD understand that monitoring is an important component of watershed restoration, a requirement of TMDL development under Montana's TMDL law, and the foundation of the adaptive management approach. Having a monitoring plan in place allows for feedback on the effectiveness of restoration activities (whether TMDL targets are being met),

[4] The LCF Sediment TMDL will likely also address the pollutant loading reductions component. The draft report is scheduled to be completed in summer 2010 and submitted to USEPA by the end of 2010. Item (c) of the pollutant loading reductions section will need to be revised after checking the completed document.

if all significant sources have been identified, and whether attainment of TMDL targets is feasible. Data from long-term monitoring programs also provide technical justifications to modify restoration strategies, targets, or allocations where appropriate. Currently Monitoring programs are undertaken by project partners (mainly USFS) as well as project-specific monitoring by contractors. For example, the Cabinet District Hydrologist has been collecting sediment and temperature data in the Vermilion River and Trout Creek drainages for the past several years. The Elk Creek and Prospect Creek watershed councils collected water quality data for a number of years, but these efforts have ceased.

Monitoring strategies are also discussed in the following reports:

a. Prospect Creek Watershed Sediment TMDLs and Framework for Water Quality Restoration presents guidance on development of more detailed and specific efforts related to monitoring (refer to Section 9.0 – Water Quality and Habitat Monitoring Plan).

b. Total Maximum Daily Loads For Metals In Prospect Creek Watershed, Sanders County Montana (refer to Section 5.3 – Monitoring Strategy).

c) Lower Clark Fork River Tributaries Sediment TMDLs and Framework for Water Quality Restoration[5] (refer to Section 5.0 – Sediment TMDL Components).

[5] Ibid

ATTACHMENT A

Nine Elements of a Watershed-based Restoration Plan (WRP)

EPA fully intends that the watershed planning process should be implemented in a dynamic and iterative manner to assure that projects whose plans address each of the nine elements above may proceed even though some of the information in the watershed plan is imperfect and may need to be modified over time as information improves.

1. An **identification of the causes and sources** or groups of similar sources that will need to be controlled to achieve the load reductions estimated in this watershed-based plan (and to achieve any other watershed goals identified in the watershed-based plan), as discussed in item (b) immediately below. Sources that need to be controlled should be identified at the significant subcategory level with estimates of the extent to which they are present in the watershed (e.g., X numbers of dairy cattle feedlots needing upgrading, including a rough estimate of the number of cattle per facility; Y acres of row crops needing improved nutrient management or sediment control; or Z linear miles of eroded stream bank needing remediation).

2. An **estimate of the load reductions expected for the management measures** described under paragraph (c) below (recognizing the natural variability and the difficulty in precisely predicting the performance of management measures over time). Estimates should be provided at the same level as in item (a) above (e.g., the total load reduction expected for dairy cattle feedlots; row crops; or eroded stream banks).

3. A **description of the NPS management measures that will need to be implemented** to achieve the load reductions estimated under paragraph (b) above (as well as to achieve other watershed goals identified in this watershed-based plan), and an identification (using a map or a description) of the critical areas in which those measures will be needed to implement this plan.

4. An **estimate of the amounts of technical and financial assistance needed**, associated costs, and/or the sources and authorities that will be relied upon, to implement this plan. As sources of funding, States should consider the use of their Section 319 programs, State Revolving Funds, USDA's Environmental Quality Incentives Program and Conservation Reserve Program, and other relevant federal, state, local and private funds that may be available to assist in implementing this plan.

5. **An information/education component** that will be used to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, and implementing the NPS management measures that will be implemented.

6. **A schedule for implementing the NPS management measures** identified in this plan that is reasonably expeditious.

7. **A description of interim, measurable milestones** for determining whether NPS management measures or other control actions are being implemented.

8. A **set of criteria that can be used to determine whether loading reductions are being achieved over time** and substantial progress is being made towards attaining water quality standards and, if not, the criteria for determining whether this watershed-based plan needs to be revised or, if a NPS TMDL has been established, whether the NPS TMDL needs to be revised.

9. **A monitoring component to evaluate the effectiveness of the implementation efforts over time**, measured against the criteria established under item (h) immediately above.

ATTACHMENT B

Lower Clark Fork Watershed
Assessments, Monitoring Reports and Other Related Reports

Clark Fork Aquatic Implementation Team. Tributary Habitat Acquisition and Enhancement, Approval and Ranking Criteria.

GEI Consultants, Inc. 2005. Lower Clark Fork River Drainage Habitat Problem Assessment. Prepared for Avista Corporation, Spokane, Washington.

Green Mountain Conservation District. 1998. Green Mountain Watershed Project Implementation Plan.

Land & Water Consulting, Inc. 2001. Bull River Watershed Assessment, Lower Clark Fork River Drainage, Montana. Prepared for Bull River Watershed Council, Heron, Montana.

Land & Water Consulting, Inc. 2001. Trout Creek Watershed Assessment, Watershed Conditions and Potential Restoration Activities. Prepared for Trout Creek Watershed Council, Heron, Montana.

Lower Clark Fork Watershed Group Technical Advisory Committee. 2002. Watershed Assessment and Restoration Work Procedure. Prepared for Lower Clark Fork Watershed Group, Heron, Montana.

Montana Department of Environmental Quality. 2009. Prospect Creek Watershed Sediment TMDLs and Framework for Water Quality Restoration.

Montana Department of Environmental Quality. 2006. Total Maximum Daily Loads For Metals In Prospect Creek Watershed, Sanders County, Montana.

Montana Department of Environmental Quality. 2009. Lower Clark Fork Tributaries TMDL Planning Area Sediment Monitoring Documentation Report.

Neesvig, C., D. Grupenhoff and A. Reif. 2007. Vermilion River Watershed Assessment and Preliminary Restoration Plan. Prepared for Avista Corporation, Noxon, and USFS Kootenai National Forest, Libby, Montana.

Neesvig, C. 2010. East Fork of the Bull River Restoration, Water Year 2009, Physical Effectiveness Monitoring Report (Draft). Prepared for US Army Corps of Engineers.

River Design Group, Inc. 2004. Final Prospect Creek Watershed Assessment and Water Quality Restoration Plan. Prepared for Prospect Creek Watershed Council.

River Design Group, Inc. and United States Forest Service. 2004. Pilgrim Creek Watershed Assessment and Conceptual Design Report. Prepared for Pilgrim Creek Watershed Council, Heron, Montana.

River Design Group, Inc. 2005. Graves Creek Watershed Assessment and Conceptual Design Report. Prepared for Avista Corporation, Noxon, Montana and Montana Fish, Wildlife and Parks, Thompson Falls, Montana.

River Design Group, Inc. 2008. Blue Creek Watershed Assessment and Restoration Prioritization Plan. Prepared for Lower Clark Fork Watershed Group, Heron, Montana.

River Design Group, Inc. 2008. Crow Creek Restoration Project, As-Built Monitoring Report – November 2007. Prepared for Lower Clark Fork Watershed Group, Heron, Montana.

River Design Group, Inc. 2008. Pilgrim Creek – Reishus/McDowell Project, Monitoring Report. Prepared for Lower Clark Fork Watershed Group, Heron, Montana.

River Design Group, Inc. 2008. Elk Creek – Platt Project, Monitoring Report. Prepared for Lower Clark Fork Watershed Group, Heron, Montana.

River Design Group, Inc. 2008. Crow Creek Restoration Project, One-Year, Post-Construction Monitoring Report. Prepared for Lower Clark Fork Watershed Group, Heron, Montana.

Smith, R.W., T.P. Vore, E.M. Pannier, and G.E. Hendrix. 1995. Tributary Survey Lower Clark Fork River Drainage, Stream Rehabilitation Project: Little Beaver Creek, Montana. Washington Water Power Company, Spokane, Washington.

Water Consulting. 2001. Stabilization and Restoration of Rock Creek near Noxon, Montana, Final Report. Prepared for Rock Creek Watershed Council, Heron, Montana.

Water Consulting. 2001. Engle Creek Reconnaissance Report. Prepared for Rock Creek Watershed Council, Heron, Montana.

Water Consulting. 2002. Whitepine Creek Reconnaissance and Watershed Assessment Validation. Prepared for Whitepine Creek Watershed Council, Heron, Montana.

Watershed Consulting, LLC. 1999. A Geomorphic and Fisheries Habitat Evaluation of Prospect Creek, Montana. Prepared for U.S. Forest Service, Plains, Montana.

Watershed Consulting, LLC. 1999. Prospect Creek Restoration Design and Bank/Channel Stabilization. Prepared for Prospect Creek Watershed Council, Thompson Falls, Montana.

Watershed Consulting, LLC. 1999. Prospect Creek – Stream Assessment/Existing Conditions. Prepared for Prospect Creek Watershed Council, Thompson Falls, Montana.

Watershed Consulting, LLC. 2000. Elk Creek (Heron) Post-Restoration Analysis and Management Recommendations. Prepared for Elk Creek Watershed Council, Heron, Montana.

Watershed Consulting, LLC. 1997. Elk Creek Near Heron – WC Level 2.5 Stream Survey, Reach Health Assessment, Management and Rehabilitation Recommendations. Prepared for Elk Creek Watershed Council, Heron, Montana.

Watershed Consulting, LLC. 1999. West Fork Elk Creek, Deer Creek, Beaver Creek – Assessment Report. Prepared for Elk Creek Watershed Council, Heron, Montana.

Watershed Consulting, LLC. 1999. A Stream Habitat Inventory of Pre and Post Restoration Conditions of Elk Creek (Heron), 1997 and 1998. Prepared for Elk Creek Watershed Council, Heron, Montana.

Watershed Consulting, LLC. 2004. Pilgrim Creek Watershed Assessment and Conceptual Design Report. Prepared for Pilgrim Creek Watershed Council, Heron, Montana.

Watershed Consulting, LLC. 2001. Whitepine Creek Watershed Assessment. Prepared for Whitepine Creek Watershed Council, Heron, Montana.

Watershed Consulting, LLC. 2004. Whitepine Creek Geomorphic & In-Stream Sediment Analysis. Prepared for Whitepine Creek Watershed Council, Heron, Montana.

Watershed Consulting, LLC. 2007. Trout Creek Revegetation Assessment & Report. Prepared for the Lower Clark Fork Watershed Group, Heron, Montana.

Watershed Consulting, LLC. 2009. A Revegetation Guide for the Lower Clark Fork River Basin. Prepared for the Lower Clark Fork Watershed Group, Heron, Montana.

Watershed Consulting, LLC and Great West Engineering. 2010. Restoration Plan for Tuscor Creek. Prepared for the Lower Clark Fork Watershed Group, Heron, Montana.

Watershed Consulting, LLC. 2010. Little Beaver Creek Watershed Assessment (Draft). Prepared for the Lower Clark Fork Watershed Group, Heron, Montana.

ATTACHMENT C

LCF Watershed Assessment Restoration Recommendations – Ranking[6] List 8/8/10

Site	Status	Rank
Blue Creek		
1. ~~Upper Kirkman Ford, EFBC Reach 4~~	Restoration Completed 2010	NA
2. ~~Mine Site, EFBC Reach 5 (Scotchman)~~	Restoration Completed 2010	NA
3. Eroding lacustrine hillslope, EFBC Reach 2		**1**
4. Lower Kirkman ford, EFBC Reach 2		**2**
5. West Fork Blue Creek road crossing, EFBC Reach 1		**3**
Bull River		
1. Main Stem Bull River (Riparian restoration – long term) - Shrub planting (16 ac.) - Stimulate shrub growth (7 ac.) - Noxious weed and introduced species control (widespread) - Wetland restoration (350 ac.) Riparian restoration projects completed: - ~~Ross reveg project~~…… - ~~Stein reveg project~~……..…… - Wood Duck reveg project……....	 Restoration Completed 2006/2007 Restoration 2002-2005 To start fall 2010	**1**
2. ~~South Fork Bull River channel restoration (South Fork Slide (SF-6))~~	Restoration completed 2003	NA
3. ~~East Fork sediment source mitigation (EF-9 /Lost Girl)~~ ~~Remove road bed USFS Rd. 2273 above and below EF-9~~	Restoration completed 2006	NA
4. ~~East Fork Bull River channel – Riparian restoration (Reach 2 (Stein) and EF-10 – mass waste upstream of EF Slide[7])~~	Restoration completed 2001	NA
5. Copper Creek channel restoration (Reach 1)		**4**
6. Main Stem Bull River (Bank stabilization) - Update sediment survey - N1/2 Section 19 (opposite Copper Creek) - N1/2 Section 19 (100 yds. downstream Copper Ck) - ~~McDowell Bridge (2 sites located downstream~~)……..…….. - S1/2 Section 24 - SE1/4 Section 26 - NW1/4 Section 25 - NE1/4 Section 26	 Restoration completed 2001	**1**
7. South Fork Bull River - ~~Slope Revegetation, SF-17~~……..…….. - Implement vegetation buffers on 1st and 2nd order drainages - Re-contour and vegetate non-system roads on mid-slopes - Implement vegetation buffers adjacent to roads and cross-drains along steep slopes	 Restoration completed 2006 Craig says SF-17 was not done. My notes say it was.	**3**
8. Snake Creek (Upland sediment source mitigation) - Implement BMPs at SN-2 and SN-3 to alleviate fine sediment sources - ~~Remove road fill and stream crossing of USFS Rd. 2018 and Snake~~		

[6] Projects have been prioritized utilizing recommendations in the various LCF drainage watershed assessments and updated with current information by the LCFWG TAC per date at top of this page. Projects are prioritized by drainage only. These rankings are based project impact and feasibility, magnitude of sediment contribution, land owner participation, and cost of restoration

[7] EF-10 Slide has naturally stabilized since the assessment survey and no restoration is needed at this time.

~~Creek (SN-6)~~ - ~~Replace culvert at SN-9 and SN-10~~ - Stabilize road fill at SN-4 - Implement vegetation buffers on 1st order drainages	Restoration completed 2002 Restoration completed 2002	
Site	**Status**	**Rank**
9. Dry Creek (Upland sediment source mitigation) - USFS finalize sediment survey - Recognize inherent instability of slopes in the Dry Ck sub-basin - Avoid new road construction in mid to upper slopes - Remove culvert and fill slope at DC-10 - Stabilize fill slope at DC-11		**2**
10. ~~EF Slide – Channel reroute away from mass waste~~	Restoration Completed 2008	NA
11. Steep eroding bank at Solid Rock Church		**5**
Elk Creek		
1. Springer bank stabilization		**1**
2. Update sediment survey (BEHI)		**2**
3. ~~Platt (riparian fencing)~~	Restoration Completed 1997 & 1998	NA
4. ~~Platt (bank stabilization, LWD placement & riparian revegetation)~~	Restoration Completed 2006	NA
5. Johns (bank stabilization)		**4**
6. Hollingshead (rechannel, remove dike)		**5**
7. Lans/USFS (bank stabilization)	Restoration Completed 2007	NA
8. ~~Deer Creek (could remove culvert/fish barrier if WCT are not pure, but they are, so no other restoration needed)~~	NA	NA
9. Beaver Creek (perform engineering check of impoundment dams)		**6**
10. Elk Creek revegetation - Redirect alder/grass stands to riparian forests - Treat clay banks with poor vegetation potential - Plant dry non-vegetated terraces		**3**
11. ~~37 sites restored on mainstem & E Fk; EWP site (Fortunati)~~	Restoration completed '97/'98	NA
12. ~~5 sites restored on W Fk~~	Restoration Completed 2000	NA
13. ~~2 sites restored on E Fk (EWP – Springer & Wilderness Lodge)~~	Restoration Completed 1996	NA
Graves Creek		
1. ~~Reach 4-3 Eroding glacial terrace (Newby)~~	Restoration Completed 2009	NA
2. Reach 4-2 Braided section (Miller and Swing Trustees, Ben Cox)		**1**
3. Reach 4-2 Eroding glacial/lacustrine terrace (Ben Cox)		**2**
4. Thorne Creek sediment source (Ben Cox)		**3**
5. ~~Thorne Creek fish passage barrier (Ben Cox)~~	Restoration Completed Date?	NA
6. ~~Woody debris placement (Ben Cox)~~	Restoration Completed 2009	NA
Pilgrim Creek (USFS Sites)		
1. W Fk 3, 4, & 5 (Mass wasting sites)		**1**
2. Two Sites - SF Pilgrim trib. (Trail 1084) (Bridge at risk of failure and culvert plugged, rerouting flow, contributing sediment)		**2**
3. South Fork R2 (Unstable banks contributing sediment)		**3**
4. Telegraph (Revegetation? FS/Reishus)		**4**
5. Telegraph (two mass wasting sites, install bankfull bench)		**5**
6. W Fk 1 (Mass wasting site)		**6**
7. W Fk 2 (Mass wasting site)		**7**
8. Telegraph FDR 2711 spur roads (Remove 3 culverts)		**8**
9. S Fk FDR 2710 spur roads (Remove road fill/culverts)		**9**
10. W Fk FDR 2744D (Remove road/culvert or install larger pipe)		**10**

11. ~~W Fk Bridge replaced and rechannelling upstream~~			Restoration Completed 2006 & 2007	NA
Site			**Status**	**Rank**
Pilgrim Creek (Private Landowner Sites)				
1. ~~Reishus 1~~			Restoration Completed 2006	NA
2. ~~Reishus 2~~			Restoration Completed 2006	NA
3. ~~McDowell~~			Restoration Completed 2006	NA
4. Linzmaier 1 (Mixed sediment, unlimited source)				**1**
5. Hayes 1 (Avulsion); Hayes 2 (Good access; treatable) & Hayes 3 (Gravel)				**2**
6. Linzmaier 2 (Fine sediment; moderate access) & Linzmaier 3 (Mixed sediment, unlimited source)				**3**
7. Hayes 4 (Clay lens) & Hayes 5 (Rotational slide)				**4**
8. Murdoch (Infrastructure, good access)				**5**
9. Hayes 6 (Good access; treatable)				**6**
10. ~~King riparian reveg~~			Restoration Completed 2007	NA
11. Riley Creek 1 (Result of avulsion) & Riley Creek 2 (Mod. stable)				**7**
12. ~~Railroad Bridge abutment removal, etc.~~			Restoration Completed 2006	NA
13. Marshall (Minor)				**8**
14. Frampton (Stabilized by LWD jam)				**9**
15. Green 1 (No access) & Green 2 (No access)				**10**
16. Hayes 7 (Gravel)				**11**
17. Edwards (Moderately stable)				**12**
18. Hill (Stabilized)				**13**
19. Hayes 8 (Localized)				**14**
Prospect Creek (Mainstem)				
1. Work with utility companies and MDT to develop mitigation plans for impacts from utility lines and highway				**1**
2. 594+00 – 651+00	(5,700 lf)	Channel reconstruction	$342,000 - $399,000	**2**
3. 560+00 – 575+00	(1,500 lf)	Meander reactivation	$39,000 - $58,500	**3**
4. 530+00 – 552+00	(2,200 lf)	Channel reconstruction	$132,000 - $154,000	**4**
5. 495+00 – 511+00	(1,600 lf)	Channel reconstruction	$96,000 - $112,000	**5**
6. 475+00 – 481+00	(600 lf)	Meander reactivation	$21,600 - $23,400	**6**
7. 442+00 – 476+00	(3,400 lf)	Channel reconstruction	$204,000 - $238,000	**7**
8. 425+00 – 442+00	(1,700 lf)	Channel reconstruction	$102,000 - $119,000	**8**
9. 383+00 – 389+00	(600 lf)	Channel reconstruction	$360,000 - $420,000	**9**
10. 330+00 – 375+00	(4,500 lf)	Meander reactivation	$117,000 - $175,500	**10**
11. 312+00 – 330+00	(1,800 lf)	Habitat enhancement	$18,000 - $36,000	**11**
12. 300+00 – 307+00	(700 lf)	Meander reactivation	$18,200 - $27,300	**12**
13. 282+00 – 290+00	(800 lf)	Meander reactivation	$20,800 - $31,200	**13**
14. 210+00 – 270+00	(6,000 lf)	Channel reconstruction	$360,000 - $420,000	**14**
15. 195+00 – 220+00	(3,500 lf)	Channel reconstruction	$210,000 - $245,000	**15**
16. 110+00 – 184+00 **TOTALS**	(10,360 lf) **44,960 lf**	Channel reconstruction	$621,600 - $725,200 $2,662,200 - $3,184,100	**16**
17. ~~YPL pipeline reroutes~~			Completed 2003	NA
18. ~~7 major sites restored~~			Restoration Completed 2000	NA

Site	Status	Rank
Prospect Creek (Main Tributaries)		
Prospect Creek (Clear Creek)		
• Natural channel design (upper 1 mile PVT; lower 3 - 4 miles FS) -Establish appropriate channel dimension, pattern & profile -Rigorous revegetation & weed treatment • Culvert replacement – upgrades • ATM - Road closure and/or decommissioning • Road BMPs & maintenance practices • Trail BMPs & maintenance in upper watershed		**1**
Prospect Creek (Dry Creek)		
• Road BMPs & maintenance practices • Riparian revegetation in lower reaches • In-channel grade control in lower reaches • Culvert replacement – upgrades • Campground relocation • Trail BMPs & maintenance in upper watershed • ATM - Road closure and/or decommissioning		**2**
Prospect Creek (Wilkes Creek)		
• Headcut stabilization in lower reaches • Removal of washed out CMPs • Table Top & Coyote CMPs • ~~Bridge replacement - upgrade~~ • Riparian revegetation • Other road work	Bridge abutments removed 2008	**4**
Prospect Creek (Cooper Gulch)		
Reach Restoration Needs and Considerations 7 Needs are minimal, but may be required to tie into new pattern for Reach 6 6 Reestablish single thread channel in the aggraded sections under the power line; new channel should be away from eroding valley slope 4 Stabilize banks; install structures to divert energy from banks with power poles 3 Reestablish single thread channel in the aggraded sections under the power line; reestablish meanders in straightened sections along the road 2 Establish a bankfull bench on the left bank at the base of the terrace. This reach will likely guide the pattern and dimension for restoration in Reach 1 1 Re-naturalize from a straight confined riffle, although feasibility may be low due to degree of entrenchment from former floodplain from former floodplain - ~~Bridge installed to replace culvert~~	Restoration Completed 2007	**4**
Prospect Creek (Crow Creek)		
• Address power line location, clearing, maintenance • ~~Natural channel design (upper mainstem)~~ ~~-Establish appropriate channel dimension, pattern & profile~~ ~~-Stabilize headcuts~~ -Rigorous revegetation & weed treatment • Culvert replacement – upgrades • Bridge upgrade & realignment • County Highway No. 471 culvert – upgrade, alignment, grade control • Road & recreation BMPs & maintenance practices • ATM - Road closure and/or decommissioning	Restoration Completed 2007	**3**
Prospect Creek (Cox Gulch)		
- Paving the section of FSR 876 that passes through the mine		

processing facility to eliminate airborne particulate pollution - Implementing BMPs on FSR 876, including surface material, drainage, and upgraded culverts. Maintenance of headwater culvert removals to meet BMP standards is also suggested. - Another restoration option to road upgrades would be removal of remaining culverts - Decommissioning of the headwater road system and valley bottom road.		**4**
Site	**Status**	**Rank**
Prospect Creek (Evans Gulch)		
- There is potential for bank restoration at dispersed camp sites along lower Evans Gulch on the left terrace and at trail-stream crossings (Low priority) - Reducing inchannel sediment sources by renaturalizing a channel in the lower Evans Gulch above and below County Highway No. 471 to prevent further headcut progression. This would include removal of the large rip-rap currently used as channel substrate above the County Highway No. 471 crossing, reshaping the channel, increasing channel length and installing grade control structures. An adequately sized crossing structure at County Highway No. 471 would be desirable. (Moderate priority) - Addressing in-channel sediment source on the West Fk. Upgrading the West Fk culvert should be prioritized, or the culvert removed and the road decommissioned. With either option, it may be necessary to install grade control structures to prevent headcut progression from channel scour at the culvert outlet. (Moderate priority)		**4**
Prospect Creek (Glidden Gulch)		
Glidden Gulch trail-stream crossings could be rehabilitated and more formal trail-stream crossing structures installed to prevent continued resource damage. BMPs should be applied to trail segments approaching stream crossings. Undersized culverts could be upgraded and BMPs applied to FSR 7615 and FSR 7627. Alternatively, the portion of FSR 7615 beyond Trail 404, and the FSR 7627 system could be decommissioned		**4**
Prospect Creek (Twentyfour Mile Creek)		
Increasing the size of the County Hwy #471 crossing so that it may adequately pass the water and bedload at high flows, relocating the lower portion of trail and re-contouring the point of capture, and repairing the trailhead parking area and access road.		**4**
Rock Creek		
1. Reach 2 Large sediment source downstream of Engle Ck. (Creek has moved away from site)		NA
2. Reach 1 (Sediment source 1 & 2)		**1**
3. Reach 3 Channel reconstruction (Sterling/Revett)		**2**
4. Seven small sediment sources		**3**
5. ~~Minor riparian bank reveg (Simpson)~~	Completed 2000	NA
Trout Creek		
1. ~~Reach 1 (Mainstem) – Morkert/USFS (two eroding terraces ~1,200 lf)~~	Riparian reveg attempted 2001	NA
2. Reach 2 (Mainstem) – Taylor (Bank stabilization)		**2**
3. Reach 2 (mainstem) – Matthew/Taylor (Fish habitat enhancement)		**2**
4. Little Trout Ck – Robbins Ranch (Riparian fencing, off-stream watering)	Landowner has been uncooperative.	**1**
5. Little Trout Ck (County Road culvert replacement)		**3**

Whitepine Creek		
1. Corridor-wide revegetation		**1**
2. Upstream road site (above Self site)		**1**
3. Downstream road site (next site upstream)		**2**
4. Chambers bridge reach (upstream & downstream)	Partially completed	**4**
5. ~~Michaels (downstream of pond)~~	Project completed 2006	NA
6. Two mass waste sites on USFS property across from gravel pit		**3**
7. ~~Bank stabilization by brush bundles/fascines & rip reveg, & rechannelling at Michaels~~	Completed 2001	NA
8. ~~Restoration at Michaels, Chambers & Self & rip reveg~~	Completed 2002	NA
9. Galligan/Babich bank stabilization		**5**
Tuscor Creek		
Site	**Status**	**Rank**
1. Page reach - Alternative 1 (Mitigation of headcutting; promotion of riparian growth) - Alternative 2 (Channel stabilization within existing geometry) - Alternative 3 (Relocation of channel)	 $ 86,670.00……. $132,770.00 $177,990.00	 **1** **2** NA
2. Hannum reach - Alternative 1 (Culvert replacement with local grade control) - Alternative 2 (Culvert replacement with channel reconstruction) - Alternative 3 (Culvert replacement with channel relocation)	 $129,720.00 $152,055.00 $350,190.00	 **3**
Little Beaver Creek		
1. Hardened crossings; off-site water for overgrazed areas; temporary exclusion fencing, coupled with lower duration, higher intensity grazing. Opportunities throughout watershed, depending on landowner involvement; priority in upstream half of LBC-1, upstream end of LBC-2, LBC-3, and discrete sites on LBC-5.	$10,000 - $20,000 per project, including planning	**1**
2. Beaver management structures (Castor master) to regulate water levels at beaver ponds and avoid severe water level fluctuations. Currently applies to reach LBC-3 (3.5) but may be necessary elsewhere with time; one structure per large pond, or anywhere high water levels from beaver activity are a concern.	$1000-$3000 per structure; Approx $3000 for surveying, depending on number of structures	**2**
3. Willow-sprigging and browse protection in areas lacking riparian vegetation, in conjunction with improved grazing management; This would encourage greater shrub cover, water supply, and habitat quality. Opportunities throughout watershed, depending on landowner involvement; necessary to allow re-establishment of shrubs currently heavily browsed by wildlife.	Depends on the number of cages needed (number of shrubs found); less than $5000 in most cases; approx $1000 for planning	**3**
4. Mature transplants with additional planting at high density to re-establish riparian area; includes weed matting and browse protection. Applicable to areas with less than 40% canopy cover (applies to approx 25,000ft of streambank).	Approx. $12 per linear ft for 15 ft wide buffer; includes maintenance, planning, and materials	**4**
5. Establishing and maintaining riparian buffer with temporary or permanent fencing, management changes to exclude riparian grazing and burning. Appropriate for all reaches (needed on approx. 5 miles).	$1000-$6000, depending on fencing type and extent	**5**
6. Building riparian area and reducing channel width with transplanted or planted sedge. Recommended for upstream half of reach LBC-1, specific sites in LBC-5.	Less than $3000	**6**
7. Streambank re-contouring (create low terrace and lower slope of upper bank) in limited incised area of LBC-5; OR install small vertical posts in stream and transplant mature riparian shrubs to encourage beaver re-colonization to raise water level. Applicable to approx 7000 ft of streambank; priority for 4,000 ft.	Approx. $10,000-$20,000 for mechanical approach, depending on design and extent; Approx. $3,000-$8000 for passive restoration approach	**7**
8. In-stream log structures or root wads to direct and concentrate stream flow for flushing sediment and to provide habitat. Appropriate for Reaches LBC-1 through LBC-3; limited in LBC-4 and LBC-5.	$1000 to $3000 per structure site, assuming more than one structure per site	**8**

Site	Status	Rank
Vermilion River		
1. 6-2 Chapel Slide		**1**
2. 6-1 Little Joe Slide		**2**
3. 6-3 Miner's Gulch Complex		**3**
4. 6-4 Sims Meander Enhancement		**4**
5. 6-5 Grouse Reach Rebuild		**5**
6. 6-6 Reach 6 Anabranch		**6**
7. 5-1 100 Ton Reach		**7**
8. 5-2 Silver Butte Reach		**8**
9. 5-3 Lyon Kennedy Rehabilitation		**9**
10. ~~Bank stabilization (downstream of Willow Creek)~~	Restoration Completed 2006	NA
Swamp Creek		
Watershed assessment		**1**

ATTACHMENT D

Clark Fork Aquatic Implementation Team
Appendix A & B
Tributary Habitat Acquisition and Enhancement

Approval and Ranking Criteria (130 possible points)

A. Proposed Project Location (20 points maximum):

1. The proposed project is within which Montana Subwatershed/Watershed?

20 Points:

Cooper Gulch (Prospect)	Rock Creek, upstream of W.F.	E.F. Blue Creek
Crow Creek (Prospect)	Vermilion River, below falls	S.F. Bull River
E.F. Bull River	Bull River, mainstem	Deep Creek
Graves Creek, below falls	Prospect Creek, mainstem	Rock Creek, mainstem

5 Points:

W.F. Rock Creek	Vermilion River, above falls	Pilgrim Creek
Marten Creek, mainstem	N.F. Bull River	Wilkes Creek (Prospect)
Graves Creek, above falls	M.F. Bull River	Whitepine Creek
McKay Creek	Copper Gulch (Bull)	Beaver Creek

0 Points:

E.F. Elk Creek	S.F. Marten Creek	Little Beaver Creek
Swamp Creek	Trout Creek, mainstem	Clear Creek (Prospect)
Elk Creek, mainstem	Dead Horse Creek	Stevens Creek
Sqayith-Kwum Creek	Mosquito Creek	W.F. Elk Creek
Tuscor Creek	Little Trout Creek	

2. The proposed project is within which Idaho Subwatershed/Watershed?

20 Points:

South Gold Creek	Savage Creek	Johnson Creek
North Gold Creek	Wellington Creek	Pack River, McCormick
Granite Creek	Rattle Creek	to Zuni creeks
Trestle Creek	Porcupine Creek	Twin Creek
Lightning Creek, mainstem	Morris Creek	Clark Fork River, mainstem
E.F. Lightning Creek	Grouse Creek, mainstem	Strong Creek
Char Creek	N.F. Grouse Creek	

0 Points:

Other LPO / Clark Fork River Tributaries

B. Fish species that are expected to benefit from the project (15 points maximum):

1. Bull and westslope cutthroat trout (no or "few" non-native fish present) (up to 15 points)
2. Bull or westslope cutthroat trout ("some" non-native fish present) (up to 10 points)
3. Few native salmonids, other native fish species, or native fish benefit indirectly (up to 5 points)
4. No native fish will benefit (0 points)
5. No target fish species will benefit (project ineligible)

C. Project is expected to protect or increase distribution and numbers of target fish species identified in A above (20 points maximum): NOTE: Score greater alternatives. For example, project benefits are in <10% of watershed (5 pts) but in >2.0 miles of stream (15 pts), score as 15 points.

1. Greatly (up to 20 points), on a watershed scale*
2. Moderately (up to 15 points): in >2.0 miles of stream or >25% of watershed
3. Somewhat (up to 10 points): in 0.5-2.0 miles of stream or 10-25% of watershed
4. Limited (up to 5 points): in <0.5 miles of stream or <10% of watershed
5. No protection increase (project ineligible)

* For the purposes of this initiative, a watershed is considered to be similar in scale to Trestle Creek, Idaho or Prospect Creek, Montana watersheds, not at the larger Lake Pend Oreille or Lower Clark Fork watershed scale.

D. What is the immediacy of threatened impacts at the site? (10 points maximum)

1. High potential threat of loss/impact (up to 10 points)
2. Potential threat of loss or impact (up to 5 points)
3. No evidence or minimal threat (0 points)

E. Long-term effectiveness of the project (15 points maximum)

1. Project solves original problem and no other significant problems exist (up to 15 points)
2. Project provides a watershed scale assessment of existing problems (up to 15 points)
3. Project partially solves original problem, but other problems exist and are likely to be corrected (up to 10 points)
4. Project partially solves original problem, but other problems exist and not likely to be corrected (up to 5 points)
5. Project does not deal with the cause of problem (0 points)

F. Project will benefit target fish species by protecting, restoring, or enhancing (15 points maximum, score all that apply):

1. Stream channel (2 points)
2. Stream banks (2 points)
3. Spawning and rearing habitat (up to 4 points)
4. Fish passage, connectivity (up to 5 points)
5. Bank and channel cover (2 points)

G. Expected benefits relative to cost (10 points maximum)

1. Project benefits high relative to cost (up to 10 points)
2. Project benefits about equal to cost (up to 5 points)
3. Project cost exceeds benefits (0 points)

H. Cost sharing or in-kind services (10 points maximum): Percent of the project that will be funded from other revenue sources and/or in-kind services.

1. 50% or greater (up to 10 points)
2. 25-49% (up to 7 points)
3. Up to 24% (up to 3 points)
4. Project will rely entirely on funding from this initiative (0 points)

I. Project complements other PM&E measure being pursued by the management committee (10 points maximum)

1. Project complements two or more other PM&E programs (i.e., Wildlife, Cultural Resources) (up to 10 points)
2. Project complements one other PM&E program (up to 5 points)
3. Project does not complement other PM&E program (0 points)

J. Project consistency with existing fishery management/recovery plans (5 points maximum)

1. Project is consistent with and complements goals and objectives of existing management or recovery plans (up to 5 points)
2. Project is not identified in or is not consistent with existing management or recovery plan goals and objectives (project ineligible)

Note:

- Only projects within the project area will be considered under these criteria. The project area is defined as the lower Clark Fork River and Lake Pend Oreille, and all of their associated tributaries from Thompson Falls Dam downstream to Albeni Falls Dam.

- Only projects that score ≥60 points, out of the possible 130 points, will move forward within this review / approval process.

ATTACHMENT E

Lower Clark Fork Watershed Improvement Projects 1997 Through 2010[8] 6/22/10

Project Drainage	Project Type	Description	Status
		2010 Proposed Projects	
LCF Tribs	WQ Imp.	Sediment & Habitat Alteration TMDL	In progress
EF Blue Ck	WQ Imp.	Mine tailings cleanup	In progress
EF Blue Creek	WQ Imp.	Bank & ford stabilization	In progress
Vermilion R	WQ Imp.	Chapel Slide mass waste stabilization	Postponed until 2011
Vermilion R	WQ Imp.	Remove undersized culverts prone to failure. Vermilion & Ice Cr.	In progress
Vermilion R	WQ Imp.	Happy Gulch Gabion Ford Removal	In progress
Beaver, Marten, Whitepine	WQ Imp.	Road Decommissioning	In progress
Crow Ck (Prospect)	WQ Imp.	Weed Control & Reveg	In progress
Cooper Gulch (Prospect)	WQ Imp.	Culvert Replacement Survey/Design	In progress
Bull River	WQ Imp.	Wood Duck Tract Riparian Forest Revegetation	In progress
Bull River	WQ Imp.	Maintenance of riparian reveg (Ross & McDowell)	In progress
EF Bull R	WQ Imp.	Maintenance of riparian reveg (Stein)	In progress
NF Bull R	WQ Imp.	Culverts installed (related to bridge installation)	In progress
Pilgrim Ck	WQ Imp.	Maintenance of riparian reveg (King)	In progress
Marten Ck	WQ Imp.	Riparian revegetation	In progress
Beaver Ck	WQ Imp.	301 Bridge restoration repair	In progress
Tuscor Ck	WQ Imp.	Reach assessment	**Completed**
L. Beaver Ck	Surv/Assess	Reach assessment	In progress
L. Beaver Ck	WSC Form.	LBCWC formed.	
		2009 Projects	
Graves Ck	WQ Imp.	Bank stabilization and fish habitat improvement by LWD (Newby & Cox)	**Completed**
Prospect Ck	WQ Imp.	Non-native fish suppression in Blossom Lakes & Creek	**Completed**
Prospect Ck	WQ Imp.	Riparian revegetation (YPL sites)	**Completed**
Prospect Ck	WQ Imp.	Riparian reforestation (mm 3.5)	**Completed**
Prospect Ck	TMDL	*Prospect Creek Watershed Sediment TMDLs and Framework for Water Quality Restoration* (MDEQ)	**EPA approval rec'd 1/21/09**
Cooper Ck (Prospect)	WQ Imp.	Large woody debris (LWD) enhancement (30 structures)	**Completed**
Marten Creek	WQ Imp.	Stream restoration & fish habitat improvement (Smith)	**Completed**
E. Fk Elk Ck	WQ Imp.	Replace two undersized culverts	**Completed**
Bull River	WQ Imp.	Maintenance of riparian reveg (Ross & McDowell)	
Pilgrim Ck	WQ Imp.	Maintenance of riparian reveg (King)	
LCF Area	Surv/Assess	*A Revegetation Guide for the Lower Clark Fork Basin* (Watershed Consulting)	**Completed**

[8] Partial list of water quality and habitat improvement projects in the LCFWG project area [Prospect Creek (Thompson Falls) to Blue Creek (Montana/Idaho) border]. List does not include land acquisition or conservation easement projects.

		2008 Projects	
Blue Ck	Surv/Assess	*Blue Creek Watershed Assessment and Restoration Prioritization Plan* (RDG)	**Completed**
Vermilion R	WQ Imp.	10 year NEPA review & water quality monitoring	In progress
EF Bull R	WQ Imp.	Channel re-route away from mass waste site & fish habitat improvement (EF Slide)	**Completed**
EF Bull R	WQ Imp.	Minor bank stabilization w brush bundle (Stein)	
Bull River	WQ Imp.	Riparian revegetation (Ross) (Spiraea & cedar)	**Completed**
Swamp Ck	WQ Imp.	Stream crossing reconstruction (ford)	**Completed**
Wilkes Ck (Prospect)	WQ Imp.	Bridge abutment removal	**Completed**
WF Fishtrap Ck	WQ Imp.	Streambank/road repair (minor project)	**Completed**
Marten Ck	WQ Imp.	Stream survey (Smith)	**Completed**
LCF Area	Surv/Assess	Tributary Intermittency (research to determine causes of dewatering)	In progress
Pilgrim Ck	WQ Imp.	Repair of Reishus site (originally completed in 2006)	
		2007 Projects	
Prospect Ck	TMDL	*TMDLs for Metals in Prospect Creek Watershed, Sanders County, Montana* (MDEQ)	**Completed**
Crow Ck (Prospect)	WQ Imp.	Reconstruction of stream channel, bank stabilization, & fish habitat improvement (USFS)	**Completed**
Cooper Ck (Prospect)	WQ Imp.	Culvert replacement with bridge	**Completed**
Chipmunk Ck (Prospect)	WQ Imp.	Culvert replacement with bridge	**Completed**
Vermilion R	Surv/Assess	*Vermilion River Watershed Assessment and Preliminary Restoration Plan* (USFS)	**Completed**
EF Elk Ck	WQ Imp.	300' Bank stabilization & fish habitat improvement (Lans/USFS)	**Completed**
EF Bull R	WQ Imp.	20' Bank stabilization (Stein)	**Completed**
Whitepine Ck	WQ Imp.	Fish habitat improvement (two pools) (USFS)	**Completed**
Bull River	WQ Imp.	Riparian revegetation (Ross)	**Completed**
Bull River	WQ Imp.	Riparian revegetation (McDowell)	**Completed**
Pilgrim Ck	WQ Imp.	Riparian revegetation (King)	
WF Pilgrim Ck	WQ Imp.	1,000' stream restoration (USFS upstream of WF Bridge)	**Completed**
Graves Ck	WQ Imp.	Rock cross vane for screw trap	**Completed**
Trout Ck	Monitoring	*Trout Creek Revegetation Assessment & Report*, Watershed Consulting (10/9/07)	**Completed**
		2006 Projects	
Elk Creek	WQ Imp.	Bank stabilization (Platt)	**Completed**
Pilgrim Ck	WQ Imp.	Rechannelling (Reishus/McDowell)	**Completed**
Pilgrim Ck	WQ Imp.	Railroad Bridge abutment removal & bank stabilization	
Bull River	WQ Imp.	Riparian revegetation (McDowell)	**Completed**
Bull River	WQ Imp.	Riparian revegetation (Ross) (N & S sites)	**Completed**
Bull River	WQ Imp.	Bridge abutment removal (Dabronski)	**Completed**
SF Bull R	WQ Imp.	Various drainage improvements (SF-17 - 2276)	**Completed**
EF Bull R	WQ Imp.	Drainage improvements (Lost Girl – FDR 2278)	
EF Bull R	WQ Imp.	Non-native Fish Suppression (first year)	In progress
Vermilion R	WQ Imp.	Bank stabilization (400')	
Prospect Ck	TMDL	*Total Maximum Daily Loads For Metals In Prospect Creek Watershed, Sanders County, Montana* (MDEQ)	**Approved 12/27/06**
Blue Ck	Surv/Assess	*Blue Creek Watershed Assessment and Restoration Prioritization Plan*, (RDG)	**Completed**
		2005 Projects	
LCF Area	Surv/Assess	*Lower Clark Fork River Drainage Habitat Problem Assessment* (GEI)	**Completed**
Graves Ck	Surv/Assess	*Graves Creek Watershed Assessment and Conceptual Design Report* (RDG)	**Completed**

Pilgrim Ck	WQ Imp.	Riparian **reveg**etation & ford (King)	**Completed**
		2004 Projects	
Prospect Ck	Surv/Assess	*Final Prospect Creek Watershed Assessment and Water Quality Assessment Plan* (RDG &USFS)	**Completed**
Pilgrim Ck	Surv/Assess	*Pilgrim Creek Watershed Assessment and Conceptual Design Report* (RDG)	**Completed**
Whitepine Ck	Surv/Assess	*Whitepine Creek Geomorphic & In-Stream Sediment Analysis* (Watershed Consulting)	**Completed**
		2003 Projects	
SF Bull R	WQ Imp.	SF Slide	**Completed**
Whitepine Ck	WQ Imp.	Repairs to four sites, and Michaels pond connection and bank stabilization work (near footbridge?) completed.	**Completed**
LCF WS Group	WSC Form.	First meeting of LCFWG (1/03)	
Prospect Ck	WQ Imp.	Relocation of eight YPL crossings & riparian plantings by YPL (6,730 plants)	**Completed**
		2002 Projects	
Bull River	WQ Imp.	Riparian revegetation (Stein)	**Completed**
Bull River	WQ Imp.	Riparian revegetation (McDowell)	**Completed**
SF Bull R	WQ Imp.	Stream restoration (rock step pools) at SN-6	**Completed**
Whitepine Ck	Surv/Assess	*Whitepine Creek Reconnaissance and Watershed Assessment Validation* (Water Consulting)	**Completed**
Whitepine Ck	WQ Imp.	Stream restoration [Michaels, Chambers & Self, plus corridor wide revegetation (stinger)]	**Completed**
EF Elk Ck	WQ Imp.	1,000 Engleman spruce planted in spring	**Completed**
Pilgrim Ck	WSC Form.	PCWC formed.	
		2001 Projects	
Bull River	WQ Imp.	Bank stabilization (McDowell)	**Completed**
Bull River	WQ Imp.	Major rechannelling & bank stabilization (Stein)	**Completed**
Bull River	Surv/Assess	*Bull River Watershed Assessment* (Land & Water Consulting)	**Completed**
WF Elk Ck	WQ Imp.	Replace undersized and deteriorated bridge. (Sanders County project)	
Elk Creek	WQ Imp.	NRCS Bioengineering workshop (6/8 & 6/9) (Hollingshed)	**Completed**
EF Elk Ck	WQ Imp.	Riparian reveg (1,000 bare root willow, dogwood, lodgepole, larch, white pine and cottonwood).	**Completed**
Trout Ck	Surv/Assess	*Trout Creek Watershed Assessment* (Land & Water Consulting)	**Completed**
Trout Ck	WQ Imp.	Riparian reveg (Morkert/USFS and USFS)	**Completed**
Rock Ck	Surv/Assess	*Final Report for the Stabilization and Restoration of Rock Creek Near Noxon, Montana* (Water Consulting)	**Completed**
Engle Ck (Rock Ck)	Surv/Assess	*Engle Creek Reconnaissance Report* (Water Consulting)	**Completed**
Whitepine Ck	Surv/Assess	*Whitepine Creek Watershed Assessment* (Watershed Consulting)	**Completed**
Whitepine Ck	WQ Imp.	Bank stabilization by brush bundle/live fascine, plus reveg at 11 sites (completed); plus rechannelling etc., in Michaels reach.	**Completed**
		2000 Projects	
Elk Ck	Monitoring	*Elk Creek (Heron) Post Restoration Analysis and Management Recommendations* (Watershed Consulting)	**Completed**
Elk Ck	WQ Imp.	36,000 WSC fry (1") stocked in mainstem & EF (4 sites) in July by MFWP (Saffel).	**Completed**
WF Elk Ck	WQ Imp.	Restoration on five sites.	**Completed**
Rock Ck	WQ Imp.	Seed & mulch streambank (Simpson).	**Completed**
Prospect Ck		Completed two of seven sites, plus reveg/brush bars (Watershed Consulting).	**Completed**
		1999 Projects	
Prospect Ck	Surv/Assess	*A Geomorphic and Fisheries Evaluation of Prospect Creek, Montana*	**Completed**

		(Watershed Consulting)	
Prospect Ck	Surv/Assess	*Lower Prospect Creek – Stream Assessment/Existing Conditions* (Watershed Consulting)	**Completed**
Prospect Ck	Surv/Assess	*Lower Prospect Creek Rehabilitation – Sites Description and Materials Needs* (Watershed Consulting)	**Completed**
WF Elk Ck	Surv/Assess	*West Fork Elk Creek, Deer Creek, Beaver Creek – Assessment Report* (Watershed Consulting)	**Completed**
Elk Creek	Surv/Assess	Level 2 survey for WF Elk, Deer & Beaver Creeks (Watershed Consulting)	**Completed**
Elk Creek	Surv/Assess	*A Stream Habitat Inventory of Pre and Post Restoration Conditions of Elk Creek (Heron), 1997 and 1998*, (Watershed Consulting)	**Completed**
Rock Creek	WSC Form.	RCWC formed.	
Whitepine Ck	WSC Form.	WCWC formed.	
Bull River	WSC Form.	BRWC formed.	
Trout Creek	WSC Form.	TCWC formed.	
Elk Creek	WQ Imp.	35,000 WSC fry (1") stocked in mainstem & EF (5 sites) in July and September by MFWP (P. Saffel).	**Completed**
Prospect Ck	WQ Imp.	Phase 1 restoration completed in September (five major sites).	**Completed**
Elk Creek	WQ Imp.	Lans & Fitchett sites repaired, and Springer minor bank stabilized at first bend upstream of WF Bridge.	**Completed**
		1998 Projects	
Elk Creek	WQ Imp.	Stream restoration continued at 15 additional sites on mainstem and EF Elk Creek.	**Completed**
EF Elk Ck	WQ Imp.	Bank stabilization by riprap (along Elk Creek Road upstream of Fortunati Bridge) (Emergency Watershed Project (EWP) designed & constructed by NRCS)	**Completed**
Elk Creek	WQ Imp.	Riparian electric fencing installed on Platt property (~3,000' on east side of creek to provide a 50' buffer).	**Completed**
Elk Creek	TMDL	Elk Creek Sediment TMDL	**Approved 12/8/98**
Prospect Ck	WSC Form.	PCWC formed.	
		1997 Projects	
Elk Creek	WQ Imp.	Watershed Consulting started stream restoration in August 1997 at **22 specific sites** on mainstem and EF Elk, including three rechannelling site on the EF Elk and one on the mainstem; five other sites were reveged only. Approximately 3,000 bare root stock planted.	**Completed**
Elk Creek	Surv/Assess	*Elk Creek Near Heron – WC Level 2.5 Stream Survey, Reach Health Assessment, Management and Rehabilitation Recommendations* (Watershed Consulting)	**Completed**
Elk Creek	WQ Imp.	Riparian electric fencing installed on Platt property (~3,000' on west side of creek to provide a 50' buffer).	**Completed**
		1996 Projects	
EF Elk	WQ Imp.	Bank stabilization (200') by riprap (Wilderness Lodge) (Emergency Watershed Project (EWP) designed & constructed by NRCS)	**Completed**
	WQ Imp.	Stabilization by riprap of toe of slide (adjacent to Springer property) (Emergency Watershed Project (EWP) designed & constructed by NRCS)	**Completed**
		1995 Projects	
Elk Creek	WSC Form.	ECWC formed.	