

Final Report

319 Grant # 209066

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Clearwater Resource Council

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Section 1.0 Executive Summary

In late spring of 2009 DEQ Agreement No. 209066 was established with the Clearwater Resource Council (CRC) to support development of the Clearwater Watershed Restoration Plan. This report summarizes the work conducted under that contract from initiation through completion in spring of 2012. Total contracted cost was \$20,000 with \$15,000 allocated to a subcontract with the University of Montana. Total project costs including match and in-kind services provided by CRC the partners amount to more than \$64,000. Major partners in this work included the US Forest Service Lolo National Forest and Seeley Lake Ranger District, Montana Fish Wildlife and Parks, Montana Department of Natural Resources, Plum Creek Timber Company, The Blackfoot Challenge, The Big Blackfoot Chapter of Trout Unlimited, and Missoula County Rural Initiatives. The goals established and achieved in the project were to: establish a Watershed Planning Group and begin characterization of the Clearwater watershed; refine current understanding of lake status, trends, and potential sources of NPS pollution that may influence future trends; engage and educate the local community regarding water quality issues; and administer the project and report results. Documentation of the tasks and details of the accomplishments are provided in a series of attachments. Significant lessons learned include: 1) recognition of the very limited information available on existing watershed conditions and non-point sources and the need to prioritize efforts to fill critical gaps; 2) recognition of the tenuous condition of Seeley and Salmon Lakes, the lack of positive trends in trophic status, and the need to develop better information on nutrient loading and sources and to continue monitoring efforts; 3) recognition of the value of collaborative efforts and a thoughtful prioritization process in leveraging additional support; and 4) recognition of the information that can be gained through volunteer efforts in the community. Priorities for further work were clearly resolved in the WPG and focus on development of better information regarding lake trophic condition and relative importance of different nutrient sources; roads and watershed disruption as sources of fine sediment and nutrients; and stream, lake and wetland riparian disruption.

Section 2.0 Background

The Clearwater River basin is a major tributary of the Blackfoot River. It represents an important source of clean, cold water to the Blackfoot River and it supports important local natural resource values as well. The lakes and associated tributaries support substantial recreational and aesthetic values in the Clearwater Valley and are central to the local and regional economies. The Clearwater Valley is distinct from the larger Blackfoot with significant urbanization in and around the town of Seeley Lake, lesser relative influence of mid- to low-elevation agricultural land, and greater relative influence of forested land. Expanding urban development has challenged the community. Land use planning, zoning, development of a sewer system, and development of an improved water system for the town of Seeley Lake have focused discussion and debate in the valley. Significant new proposals for land conservation, restoration, and collaborative stewardship are being explored as well, but there is limited data, knowledge, and agreement on the critical water resource issues and threats.

The Middle Blackfoot-Nevada Creek TMDL included the Clearwater watershed and addressed some sediment loading and nutrient issues associated with five 303(d) listed streams in the Clearwater basin (Buck Creek, Richmond Creek, Deer Creek, Blanchard Creek, and the West Fork Clearwater River). The TMDL also summarized issues on Seeley and Salmon lakes and recommended further monitoring, a detailed review of available data to determine appropriate monitoring parameters and frequency, compilation of sufficient data for a watershed loading and lake response model, and better definition of nutrient source loadings.

One need for the work initiated with this project was to begin development of a watershed restoration plan (WRP) that extended any guidance in the Middle Blackfoot-Nevada Creek TMDL and identified existing information and key information gaps. To accomplish this, we convened a watershed planning group (WPG) represented by stakeholders in the basin. Some basic information and expertise to develop a watershed plan already exists, but it has not been synthesized. There is also some inconsistency in interpretation of existing conditions. For example, the TMDL directly addressed sediment loading and nutrient issues associated with five 303(d)-listed streams. Areas of concern include organics, siltation or sediment (all listed streams), and nutrients (on Deer Creek and the West Fork Clearwater). The TMDL also indicated that these streams were partially or fully supporting of beneficial uses. At the same time, information available from FWP and the Forest Service suggest a greater level of concern. For example, an assessment of watershed characteristics conducted by the Lolo National Forest concluded that all five streams were functioning at unacceptable risk for substrate embeddedness, sediment, and pools. The development of a WPG begins to develop working relationships among key stakeholders in the basin, can help identify inconsistencies, uncertainties or gaps in critical information, and can develop a logical process for prioritization of action and additional information needs.

A second need was to refine current understanding of lake status and potential sources of nutrients. The Middle Blackfoot-Nevada Creek TMDL report recognized existing limitations in understanding regarding Seeley and Salmon lakes and recommended more detailed analysis of existing data and continued monitoring to assess water quality conditions. The report also recommended compilation of sufficient data for watershed loading and lake response models. Although funding will not allow further monitoring or development of new data or models, a critical analysis of existing information should identify priorities for continued monitoring or acquisition of further data needed to address lake response issues.

Section 3.0 Goals.

The goals were outlined in the project proposal initiated by the Clearwater Resource Council were as follows:

- Establish a WPG and begin characterization of the Clearwater watershed;
- Refine current understanding of lake status, trends, and potential sources of NPS pollution that may influence future trends;
- Engage and educate the local community regarding water quality issues; and
- Administer the project and report results.

Our hopes were to build working relationships that would facilitate a better understanding of water quality issues in the basin both among resource managers and the public, development of important new information, and development of alternatives to conserve and restore water quality and habitats that directly influence important natural resource values. In the first formal meeting of the group on July 19, 2009 we outlined specific goals for the group as follows:

- Build a collaborative group that can gain benefits beyond individual parties
- Identify water resource issues and priorities for new information and restoration
- Provide a foundation for new funding and support
- Provide a foundation for integrated planning with other resource issues

The project goals were met with varying levels of success. Group membership was by invitation and although all invited parties participated at some level it was often difficult to get more than two or three to participate in any meeting. Several members participated regularly in the meetings and/or reviewed materials and provided comments in a timely manner. Engaging all the parties important to water related issues in the Clearwater Basin on a consistent and timely basis however was not possible.

The project did begin characterization of the Clearwater watershed, and identified a number of important issues and potential actions to characterize current conditions in the Watershed. In general however, data were limited or we were not able to obtain consistent interpretation of existing conditions. Although BMPs have been recommended as part of the TMDL, few site level projects have been identified. In some cases members of the WPG disagreed on the importance of potential stressors or sources.

We were able to refine current understanding of lake status and trends for two lakes most vulnerable to human caused pollution. Essentially, there is no evidence of positive or negative trends and both lakes are considered mesotrophic. There is clear evidence of ground water contamination from failing septic systems and increased development could mean that source of loading has increased although it could not be quantified (Attachment C). Very limited data indicate upland sources from Deer Creek could still be important.

We were able to successfully engage and educate the community. The volunteer based Adopt-A-Lake monitoring effort was continued with active support on all the major lakes in the basin. Volunteers conducted regular transparency and temperature monitoring on each lake. Two volunteers with technical backgrounds undertook regular oxygen monitoring on two lakes providing the basis of the Areal Hypolimnetic Oxygen Deficits reported in the critical analysis of the lake status outlined above. Materials, labor and analysis were donated through the efforts of volunteers linked to the University of Montana, University of California at Davis and the University of Wisconsin. Our volunteers reported a blue-green algae bloom on two lakes that was later confirmed through sampling. We were asked by members of the Community Council to provide information about the lakes relevant to discussions on the sewer and provided a series of articles and information to support that effort. Additional funding was provided by the Seeley Lake Community Foundation. Volunteer efforts have now expanded to include monitoring for aquatic invasive species.

Although some aspects of the project were not as successful as hoped (e.g., identification of restoration actions and existing data needed for watershed characterization), our efforts have led to important secondary benefits and additional support that should dramatically expand and refine that information. The prioritization scheme that linked spatially explicit ecological conditions and an index of watershed disruption associated with roads can be used to guide development of new information and was supported by MT FWP the Forest Service and members of the WPG. That approach became the foundation for a "Model Watershed Project" subsequently funded in the Clearwater basin for 10 years by the Bonneville Environmental Foundation. That support will leverage additional resources for planning, community outreach and restoration. The approach has also been adopted by the Southwestern Crown of the Continent Collaborative Forest Restoration Project to guide prioritization of restoration on Forest Service Lands over the next 10 years. Efforts to refine understanding of road related erosion and finer scale priorities through GRAIP and NetMap outlined under the Information and Gaps discussion of this report have also been funded.

Section 4.0 Activities

4.1 TASK 1 – PARTNERSHIP & PLANNING

From Attachment A of the DEQ Contract with CRC: *“Contractor will compile and analyze existing and available water resource and land use related data/information, GIS coverage, and associated analyses for the Clearwater River watershed. Contractor will develop and implement a Quality Assurance Project Plan (QAPP) to guide the collection and analyses of existing and available information, and the creation of a watershed characterization report (see Task 2). Contractor will conduct planning meetings with interested stakeholders in the Blackfoot Valley to identify existing and available information and analyses. Contractor will also coordinate discussion among the stakeholders to identify and prioritize key water quality issues, limitations of existing data and analyses, and strategies for addressing limitations for future work within the project area.”*

Activities completed:

We convened a Watershed Planning Group (WPG) that included stakeholders associated with the Clearwater and Blackfoot watersheds. Participating stakeholders included representatives from U.S. Forest Service (USFS), MT Fish Wildlife and Parks (MTFWP), MT Department of Natural Resources, Plum Creek Timber, Missoula County, Big Blackfoot Chapter of Trout Unlimited, Blackfoot Challenge, Missoula County, MT Department of Environmental Quality. Others invited, but that did not participate directly in meetings included the Seeley Lake Sewer District, Seeley Lake Water District, Missoula Conservation District. We held seven formal meetings (1 in Missoula and 6 in Seeley Lake), and conducted some discussion via e-mail.

We began a QAPP for secondary data, but in subsequent discussions with DEQ determined that a Matrix (attachment A2) of values, stresses and available information would serve the purpose of the QAPP. Later DEQ asked that the QAPP be conducted for the lake analysis portion of the project. In subsequent discussion DEQ and CRC concluded that was inappropriate because it was not required in the U of M contract (attachment F) approved by DEQ and that the MATRIX was the appropriate format. The Matrix included a section on information quality that was developed and scored by members of the WPG. Because so little formal information is actually available outside work on the lakes the Matrix was the appropriate format. A Sampling and Analysis Plan for the volunteer monitoring program (Task 4; Attachment D.1) was completed and approved by DEQ and provided as reference for the WPG.

The WPG discussed prioritization for restoration activities and developed a scheme to guide restoration priorities spatially across the Clearwater basin based on existing information on watershed condition from the USFS and on the status of native fishes from MTFWP. A discussion of information gaps and some general restoration activities was also developed for prioritization by the WPG. Priorities supported by the group in the final meeting on February 15, 2012 are summarized in attachment B.2.

4.2 TASK 2 – WATERSHED CHARACTERIZATION

From Attachment A of the DEQ contact with CRC: *“Contractor will summarize and synthesize information developed or identified through Task 1 and Task 3 of this agreement and develop appropriate maps and databases. Contractor, in cooperation with interested stakeholders, will develop a prioritized listing of projects and corresponding financial plans for each. Projects will include but are not limited to: data analysis; data gap analysis; mapping; and risk analysis. Under the guidance of the QAPP produced as part of Task 1, the Contractor will generate a report characterizing the Clearwater River watershed.”*

Activities completed:

The WPG completed a Matrix of values and stresses associated with known and potential sources of water pollution in the Clearwater Basin based on the experience and information sources from the members. A "Watershed Characterization" was initiated based on the format outlined in the Blackfoot Restoration Action Plan. Characterizations were completed for six of 13, 6th code watersheds in the Clearwater where some basic information was available and are summarized in attachment B.1.

A summary of "Information, Information Gaps, and Priorities for Action Related to Non-Point Source Pollution in the Clearwater Basin" was written and circulated with the WPG for review. Priorities for actions were established through discussion and weighting of issues by the WPG and are summarized in attachment B.2. A prioritization scheme based on ecological values associated with native fishes was also developed as an approach to guide the spatial distribution of efforts to restore watershed functions and integrate watershed and forest restoration efforts anticipated through other initiatives (see attachment B.3). We considered this prioritization as a pilot that could be refined to consider other values such as water supply and aesthetic and economic values linked to the lake conditions.

Very little information in the form of maps or data were generated by the WPG. The information made available by MTFWP and USFS were summarized in the prioritization scheme and coverages are available with that appendix (attachment B.3). References to existing or potential information available through the members of the WPG or others were identified in the matrix and associated references. Data available on lakes were summarized in "Lake Water Quality, Trophic Status and Potential Loading Sources for Clearwater Lakes" report outlined in Task 3 (and see attachment C) and the annual monitoring reports for the "Adopt a Lake" volunteer monitoring program outlined in Task 4 (see attachment D2 and D3).

4.3 TASK 3 – LAKE WATER QUALITY, TROPHIC STATUS AND POTENTIAL LOADING SOURCES FOR CLEARWATER LAKES

From Attachment A of the DEQ contract with CRC: "Contractor will prepare a report analyzing trends in lake trophic status and water quality of the Clearwater lakes. The report will emphasize year-to-year variability in the long-term record on Salmon Lake to detect trends over time. Additionally, the report will incorporate an analysis of trophic state indicators associated with nutrients, chlorophyll and water clarity, temperature stratification and hypolimnetic oxygen deficit data. Contractor will include potential loading sources of those parameters to Seeley and Salmon lakes based on existing information (such as septic tank density and location; disturbed wetlands and other land uses). The Seeley Lake Preliminary Engineering Report (PER) and simple nutrient yield coefficients and models will be used to assess relative sources. The report will also address lake internal recycling of nutrients. The information and/or data to compile this report and conduct the analysis will be from publicly accessible databases that include data from the 1970's and 1980's and recent data from the Montana Department of Environmental Quality (DEQ) and any other sources who has quality assured data available."

Activities completed: We established a contract with Vicki Watson of the University of Montana (UM) with review and approval by DEQ. We provided all known sources of information including published reports, data collected through the Adopt a Lake program (Task 4), local sewer district and home owners associations, and worked with UM to develop a work plan for the analysis and report. We met with UM on 12 occasions and provided continual review and discussion of information, ideas and approaches to the analysis and summary. We worked with UM to resolve billing issues, lack of progress and the resignation of a graduate student.

4.4 TASK 4 – ADOPT-A-LAKE SECCHI MONITORING PROGRAM:

From Attachment A of the DEQ contract with CRC: *“Contractor initiated the Adopt-A-Lake program in 2008, which includes 5 lakes. Contractor will revise the monitoring plan based on the experience from 2008 and continue to recruit, train, and coordinate volunteers. Prior to expanding the program, Contractor will develop a Sampling and Analysis Plan (SAP) in coordination with the DEQ Contract Liaison. The SAP must be approved by the DEQ Quality Assurance Officer prior to initiating any new monitoring activity. Contractor will ensure the SAP addresses identified primary objectives of collecting consistent long-term information on Secchi transparency as an index of lake trophic status, and educating the local public and engaging them in a discussion about the lakes.”*

Activities completed: A SAP was written and approved by DEQ. The volunteer program was expanded to include routine monitoring by volunteers all of the eight lakes in the Clearwater basin. Monitoring now encompasses three full years. Reports for sampling in 2009 and 2010 were completed within the duration of this project. Donations of equipment, analysis, and additional funding through members of the WPG and others, supported the general sampling as well as measurement of hypolimnetic oxygen deficits and nutrient monitoring in Seeley and Salmon lakes.

4.5 TASK 5 – EDUCATION & OUTREACH

From Attachment A of the DEQ contract with CRC: *“Contractor will coordinate Education and Outreach activities that can include but are not limited to: publishing of articles in local newspapers; publishing of newsletter for distribution to interested stakeholders; updating information on water quality issues on contractor’s website; updating Adopt-A-Lake program on contractor’s website; updating existing data from Adopt-A-Lake program and publishing analysis as necessary via website and articles.”*

Activities Completed: In addition to training and work with individual volunteers outlined under Task 4, we held 3 public meetings to discuss the lakes and how they work. Three articles were written for the local newspaper. The annual reports summarize the lake monitoring were circulated to volunteers and posted on the CRC website (see attachment E.1). In addition the program was featured in the Missoula County Rural Initiatives highlights of water related public efforts in the County (<ftp://www.co.missoula.mt.us/ruralftp/StreamProtection/CommunitySpotlight/CRC-Adopt-a-Lake.pdf>). Volunteers also attended several meetings of the Seeley Lake Sewer Board and met with members of the Community Council to provide information on lake conditions and the potential implications of ground water contamination associated with failing septic systems.

4.6 TASK 6 – CONTRACT ADMINISTRATION

From Attachment A of the DEQ contract with CRC: *“Contractor will provide contract management, invoice review, financial reports, and progress reports as described in SECTION I: SERVICES of this 319 funds agreement. All documents must be in compliance with Water Quality Planning Bureau (WQPB) Document Requirements incorporated into this contract as Attachment C. “*

Activities completed: CRC staff has submitted quarterly reports outlining progress towards project goals and financial accounting for both the grant sums and the required match. There were considerable volunteer hours involved in both the lake sampling over multiple years and the WPG meetings and that information resulted in an extremely high match. In addition, copies of newspaper articles, meeting minutes and other contract deliverables were maintained and reported and included in the quarterly and annual reports. Copies are also included as attachments to this final report.

Additionally, CRC staff has created and managed the subcontract with University of Montana and reviewed and paid invoices and provided reports as required by the 319 grant.

Section 5.0 Partners

Primary partners in this project include the participants in the WPG. The USFS (Seeley Ranger District and Lolo Forest), MT FWP (Montana Fish Wildlife and Parks, Region 2), Plum Creek Timber Co. (PCT), MT DNRC (Montana Department of Natural Resources), Missoula County Rural Initiatives, Blackfoot Challenge, and Big Blackfoot Chapter of Trout Unlimited, all participated in discussions, provided information, and or review of draft materials for the Matrix. The USFS and MT FWP were primary sources of data and review supporting the draft prioritization scheme. The Blackfoot Challenge provided background and a format for the watershed characterization.

The University of Montana was the subcontractor for analysis of lake trophic status and trends, conducted the data summary and analysis and wrote the lake report. The USFS and PCT provided copies past reports on lake water quality that supported the analysis. PCT, MT FWP, the USFS, and volunteers associated with the University of Wisconsin, University of California Davis, and University of Montana Flathead Biological Station donated materials, equipment, and analyses to support the Adopt a Lake program. More than 25 local volunteers conducted the lake monitoring. The CRC project manager, a board member, and a volunteer with data management experience coordinated the lake volunteers and managed the data generated by their efforts. PCT provided methods for development of hypolimnetic oxygen deficits and reports for comparison with work on Swan Lake. Bruce Rieman and Daniel Hatley (a board member and a volunteer respectively) conducted the oxygen monitoring on Seeley and Salmon lakes. The Seeley Lake Water District provided data on ground water sampling near the town. The Seeley Lake Sewer District provided access to the Preliminary Engineering Report for the proposed Seeley Lake Sewer.

Additional funding for the project was provided by the Seeley Lake Community Foundation. In-kind support was provided by the Ecosystem Management Research Institute through GIS analysis. Members of the WPG donated their time and travel expenses. Board members from CRC donated their time for WPG meetings, coordination with the UM, travel and writing reports.

The Seeley Swan Pathfinder edited and published articles on the lakes, notices for meetings, and discussion of related issues. Missoula County Rural Initiatives provided additional publicity for the Adopt a Lake project.

Additional funding for a “Model Watershed Project” was provided by the Bonneville Environmental Foundation and helped support completion of this report. Funding was also obtained through the “SW Crown of the Continent Collaborative Forest Landscape Restoration Project” and, in collaboration with The Wilderness Society, through the “Great Northern Landscape Conservation Cooperative”. That funding is now supporting pilot/demonstration projects with protocols and data generated by the US Forest Service PacFish-InFish Biological Opinion Monitoring Program (PIBO), the US Forest Service Rocky Mountain Research Station Geomorphic Roads Analysis and Inventory Procedure (GRAIP) and NetMap a GIS framework for evaluation of road effects (see Attachment B.2 discussion of Erosion and Sediment Loading) to explore the utility of these tools to refine prioritization, restoration and monitoring related to non-point source sediment and nutrients.

Additional funding, materials and in-kind support were provided by the Missoula Conservation District, MTFWP, GreenWing Restoration, the Seeley Lake Junior High, the Double Arrow Landowner’s

Association, and local volunteers to develop a riparian demonstration project to help publicize stream side conservation issues identified by the WPG. This project was not part of the original contract, but represents the sort of leverage that has come through the efforts of the WPG.

The partnerships developed in this project were largely very positive and clearly extended the resources and work that could be accomplished. The primary shortfalls were simply the lack of time that members of the WPG had to devote to meetings, generation of information, and review of materials. An important challenge remains in obtaining unpublished data that exist or are being developed by several members of the group.

Section 6.0 Complications

Task 1. The initiation of the project met some concern voiced by several participants in the WPG. The primary issue was that the process of subcontracting the lake work with the University of Montana had not been collaborative or open. Primary criticism was that it did not involve all members of the WPG and was not based on a competition among multiple potential bidders. Because the UM developed the original proposal, the CRC viewed them as an equal partner in development of funding even though CRC became the primary contractor. The DEQ supported CRC's interpretation and the work was subcontracted with UM. In hind sight, full discussion of the lake work with the WPG and consideration of other potential contractors before concluding where the work would be done would have strengthened the working relationships.

A second issue was linked to the requirement for a QAPP under Task 1. In the contract DEQ required a QAPP for secondary data to guide Task 2. The WPG discussed use of information quality in the Matrix developed under Task 2 as the basis for a QAPP because no real data were to be analyzed as part of Task 1 or 2. The intent was to essentially identify what sources of information exist, potential limitations of that information, and to build a foundation for a future Watershed Restoration Plan. Initial discussions with DEQ confirmed that this would be appropriate. Subsequently, DEQ reversed itself and determined that a formal QAPP would be required for Task 1. CRC initiated a draft and provided an early version for review by DEQ; no comments were received, but DEQ decided that a QAPP would not be required for Task 1, and would be required for Task 3 with the UM. CRC voiced concern that the subcontract with UM had already been let with support from DEQ, that a QAPP was not required in that subcontract, and that substantial work including a work plan had already been done by UM. After further discussion DEQ decided that the Matrix would suffice for the QAPP requirement, but admonished CRC that the information generated by the project may not be useful. In hind sight, the extended discussion did little to benefit the project, wasted some time and funding, and created frustration on both sides. In the future it would be very useful to carefully discuss the utility and format of a QAPP very early in the contract. Serious discussion should focus on what makes sense and how it can be done depending on the nature of the data that might be used. A QAPP would have made sense for Task 3 of this project as the primary focus is on synthesis of secondary data if that had been identified as a need early in the project. In the end, CRC has worked closely with UM to insure that the sources of any data, potential limitations, and uncertainty are fully considered in the lake analysis.

Task 3. A third issue has been timely completion of work by UM. CRC provided all reports and potential information sources it had identified, and worked with UM to develop a work plan. Initial work was good, but then lagged as the primary investigator (PI) was distracted by health issues. By spring 2010 it was apparent that the graduate student on the project had completed little of the anticipated summary or analysis and was struggling with direction. CRC discussed the issues with the PI and began regular meetings to review progress on the project. Work has subsequently improved and significant progress

has been made, but the graduate student decided to switch to another project. As a result the PI has had to conduct most of the summary and analysis. Health issues, teaching schedule, and family emergencies have slowed the process. As a result CRC requested a project extension from June of 2011 to December of 2011 and then to June 2012. Ultimately the work was completed and a good report was produced. In hind-site project meetings should have been held on a regular basis (monthly?) from the initiation of the subcontract. CRC should have required preliminary work products and not just written documentation of progress.

Section 7.0 Recommendations

The recommendations from this work follow from the discussions, information gaps, and priorities developed by the WPG and from the critical analysis of information available for Salmon and Seeley Lakes conducted by the University of Montana. The recommendations are as follows:

- Continue and even expand the focus on the lakes because of their key ecological, social and economic values and potential vulnerability to a “tipping point”. Develop better information on current nutrient supply and the primary sources of nutrients including, but not necessarily limited to septic systems and tributary watersheds. A relatively simple step will be to replicate the 1977 EPA nutrient loading estimates to determine whether loadings from watersheds has changed, but a more complete analysis of all potential sources for Seeley, Salmon and other lakes should be considered.
- Resolve the conflicting information and views on the importance of roads and their effects on erosion, in channel substrates (e.g. fine sediment) and as a source of nutrients. Acquire the existing inventory or road crossings and BMPs conducted on Legacy Lands (lands transferred from Plum Creek Timber to Conservation Ownership) and consider replicating those inventories in priority watersheds. Develop better information on stream channel conditions to validate the conceptual tie between roads and stream habitats. Develop better information on nutrient supply in heavily roaded and lightly roaded watersheds to test the influence of roads and road management on nutrient supply. Use new analytical tools such as NetMap and inventory/monitoring tools such as GRAIP to help resolve and prioritize areas for collection of better information or focus restoration.
- Refine the prioritization process developed by the WPG to consider values associated with water supply and water quality/nutrient supply for the lakes. This will require some progress based on the two recommendations outlined above.
- Develop a better understanding of riparian, shoreline and wetland conditions throughout the basin. Review the riparian analysis conducted by the Montana Natural Heritage Program for Missoula County. Consider next steps for restoration or better information based on current status and the potential to determine change within the spatial priorities outlined by the WPG.
- Continue monitoring and expand where possible to address key uncertainties. Continue Secchi, oxygen, and nutrient monitoring for lakes and consider expanding to include other approaches such as Chl-a, and shoreline periphyton (an index of groundwater nutrient sources). Inventory and monitoring the implementation of road BMPs in priority watersheds. Seek support for monitoring the effectiveness of any restoration actions associated with other programs such as the Southwestern Crown Collaborative Forest Landscape Restoration Project. Seek funding to continue

and expand support for lake monitoring and nutrient supply estimates from key tributary watersheds.

- Continue community outreach and education on riparian, shoreline and wetlands values and continue demonstration projects on riparian conservation and restoration. Continue community outreach and education on lake status and the critical processes influencing the lakes. Involve students and volunteers in monitoring and any further work wherever possible.

Section 8.0 Deliverables

Deliverable	Status	Description
Draft and final QAPP	Final draft of the "matrix" circulated in October 2010. Final draft was provided to DEQ for review in December 2011.	Per agreement with DEQ, Matrix with information quality serves as QAPP; a summary of WPG activities and methods included as Attachment A. Meeting agendas and meeting minutes included as Attachment A.1 and the final Matrix is Attachment A.2.
Watershed Characterization Report for the Clearwater Watershed	Final revision completed based on comments from Draft submitted to DEQ and WPG, December 2011	Characterization of six of 13 subwatersheds (6 th code HUCs) based on format from the Blackfoot Restoration Action Plan and information generated through the WPG included as attachment B.1. Information, information gaps and priorities for action included as Attachment B.2. Prioritization scheme to spatially focus collection of better information and restoration included as Attachment B.3.
Report detailing, water quality, trophic status and potential loading sources for Seeley and Salmon Lakes	Draft submitted to DEQ January, 2012	Included as attachment C.
Final SAP for Adopt a Lake and lake reports posted to the CRC Web site.	Final SAP completed 2009; Adopt-A-Lake progress reports posted to CRC web page in May 2010 and May 2011	Attachment D includes documentation for Task 4. SAP included as Attachment D.1; Adopt a Lake Reports included as Attachments D.2 and D.3.

Deliverable	Status	Description
News articles, public meetings, and reports provided to volunteers and the public	6 articles completed, 3 public meetings held; two reports summarizing the volunteer results completed (See Adopt-A-Lake above); all periodically through duration of the project	Copies of articles, reports, and public meetings accomplished summarized in Attachment E.1.
Contract management, written progress reports, written budget reports		Attachment F