

UNRBA Nutrient Credits Project

Exhibit A - Scope of Work

Introduction

The Upper Neuse River Basin Association (UNRBA) requires assistance from a qualified and experienced contractor to develop a more comprehensive nutrient credits toolbox that includes appropriate practices and measures for use in the Falls Lake watershed and to assist in the development of a more flexible nutrient reduction management program for the basin. The work covered under this scope will significantly expand the list of potential nutrient reduction practices and will focus on practices beyond those that are being developed by the NC Division of Water Resources and coordinated through the Nutrient Science Advisory Board (NSAB--created under Jordan Lake legislation). The main objective of this UNRBA project will be to provide jurisdictions in the Falls watershed subject to nutrient management strategies an expanded list of Best Management Practices (BMPs), and/or tools, to achieve their respective reduction goals. This scope of work was developed to assist the UNRBA in estimating and calculating credits associated with a list of nutrient reducing measures that will be identified and screened in this Project. This work will also identify and develop, as appropriate and authorized, tools that can be used in the tracking of nutrient loading and credits, and, if funded, undertake additional efforts to help define an appropriate trading framework . Using recommendations from the previous work done under UNRBA contracts, State agency input, and other information, the team of the Center for Watershed Protection, Inc. and Cardno ENTRIX will work in cooperation with the UNRBA to accomplish the tasks identified in this scope of work.

The North Carolina Department of Environment and Natural Resources (DENR) is providing \$50,000 to supplement the funding for this project. The State funded portion of this work will be coordinated through DENR's Division of Water Resources (NCDWR). These State funds will be assigned specifically to Subtask 1.2 as described below. NCDWR must also eventually approve the level of credit associated with each BMP that can be used under the Falls Lake Rules to meet reduction requirements. Thus, as the project proceeds and is completed, NCDWR will review the work products associated with this effort along with representatives of the UNRBA. Cardno ENTRIX and the Center for Watershed Protection, Inc. will seek review and comments from the UNRBA and NCDWR throughout this process by providing initial draft materials and hosting web-assisted meetings to solicit feedback. The Project Team will use the written comments and the results of these web-assisted meetings to finalize deliverables. The objective of this review process is to seek agency guidance on how to best to craft the work products and to secure timely approval of credits proposed through this work.

The following project tasks are designed to provide the UNRBA with the information needed to seek approval of nutrient credits, the calculation tool(s) for the application of the nutrient reducing measures (as approved) and, if funded, the development of information for a trading framework.

All written submittals for tasks will be in electronic formats compatible with Microsoft Word or Adobe Portable Document Format (PDF). All maps, figures, and GIS data will be in electronic formats compatible with Adobe or ESRI ArcGIS 9.3 software. Numeric, tabulated data and associated calculations will be submitted in electronic formats compatible with Microsoft Excel or Access 2007. Meetings, either in person or as web-assisted sessions as well as technical memoranda will be used to communicate draft and final work products and results to the UNRBA and the NCDWR. A web-assisted session in this context means a web-based meeting where the presentation can be viewed and comments and feedback provided by multiple participants located in different locations than the presenters. Web-assisted meetings will be used to increase participation in meetings by UNRBA and NCDWR members with limited time availability or travel resources.

Optional Tasks

Tasks identified in this scope of work as “optional” were identified as such during finalization of the scope for inclusion as an attachment in the services contract. Optional tasks described in this Scope of Work will be conducted at the discretion of the UNRBA. The Executive Director (or designee) will coordinate consideration of optional subtasks with the UNRBA’s Path Forward Committee. Optional task approval will follow the procedures established by the UNRBA Board. Approved optional tasks will be reflected appropriately, as needed, through a contract amendment or other mechanism to assure clear communication to both parties of the need to undertake and complete the work as described for any optional task(s) selected for completion.

TASK 1 - Literature review and database development

The purpose of this task is to compile literature information for screening of practices included on the initial list and selecting from that larger list a final list of nutrient reducing measures for this project and to analyze the credits and minimum implementation standards associated with the selected nutrient reducing measures. Practices that will be examined under this task will exclude those that already have a NCDWR-approved credit or those measures where work is underway in NC to develop credits for approval. There are six subtasks associated with Task 1.

1.1 Project Preparation/Support Tasks

Subtask 1.1 provides for preparation and support for other Tasks associated with this project. The following subtasks are included:

- a. Develop the database structure and quality metrics with UNRBA and NCDWR
 - i. Identify and recommend attributes and quality levels based on Center for Watershed Protection, Inc. existing protocols;
 - ii. Identify metrics to qualify a measure for review under NC guidance on nutrient credit approval (NCDWR currently has a draft guidance document that classifies potential measures into three Tiers). Every measure for consideration will need to be evaluated to determine its potential classification under the agency's guidance (Tier 1, 2, or 3: this step will include discussions with UNRBA/DWR, recognizing this translation to Tiers may change as the project progresses).
- b. Perform background research (including a meeting with key stakeholders) to identify appropriate nutrient reducing measures to include in the screening level analysis (e.g., key organizations and stakeholder groups such as NRCS, Soil and Water, WOC—Watershed Oversight Committee, various LG—local government—stormwater departments, NSAB, academic and research community, NCDWR and other local and State organizations with stormwater nutrient management responsibilities and experience). Coordinate with the agricultural community and the WOC to help evaluate the technical feasibility, obtain data on the effectiveness of practices, and determine likelihood of success of agricultural nutrient reducing measures.
- c. Develop and incorporate stream transformations (stream lengths, flow scaling based on drainage areas, assumed cross sections (Piedmont regressions) -> velocity -> time, assume first order loss rates (e.g., SPARROW))
- d. Develop and incorporate trapping in impoundments (obtain bathymetry data, use empirical equations to estimate trapping)

Task 1.1 Assumptions

- Stream transformations and trapping in impoundments will be estimated using pre-developed empirical methods

Task 1.1 Work Products

- Develop and participate in a web-assisted meeting for UNRBA/NCDWR to
 - discuss the database attributes and data quality levels
 - findings regarding survey development
- Draft memorandum regarding stream transformations and trapping in impoundments
- Final memorandum following UNRBA / NCDWR review to include database structure and its attributes

1.2 Screening Level Literature Review - 55 BMPs

Subtask 1.2 includes a compilation of available literature for the full set of nutrient reducing measures provided in the May 2013 RFQ and populating the database with a subset of the attributes developed under Subtask 1.1 to allow for a screening of the measures for full development and credit assessment. This task also includes development of a brief survey to evaluate the implementation potential for nutrient reducing measures. The following subtasks are included:

- a. Review and confirm list of 55 BMPs to review with UNRBA (e.g., clarify types of measures, add specifics needed to isolate a single measure)
- b. Preliminary research and data collection for 55 BMPs (literature review of peer and non-peer literature and other data sources)
- c. Populate database with a subset of key attributes for each nutrient reduction measure as identified in Subtask 1.1
- d. Assess quality of existing and new data sources
- e. Develop survey to evaluate implementation potential for measures (e.g., key organization and stakeholder groups such as NRCS, Soil and Water, WOC—Watershed Oversight Committee, various LG—local government—stormwater departments, NSAB, academic and research community, NCDWR and other local and State organizations with stormwater nutrient management responsibilities and experience).
- f. Describe survey and instructions to the UNRBA and DWR (invite additional survey participants to meeting as needed)
- g. Implement survey tool and compile results
- h. Analyze survey and screening level database to identify and recommend 20 to 25 priority nutrient reduction measures and identify 4 to 6 additional measures that the UNRBA will suggest to USEPA/NCDWR for credit development through a separate contract with another contractor

Task 1.2 Assumptions

- The screening process will reduce the number of nutrient reducing measures from the initial list to a list of approximately 20 to 25 measures. The final number of measures developed for this project will depend on discussions with UNRBA and NCDWR regarding development of additional supporting documentation for some measures. In other words, if additional documentation is requested for certain measures, this effort will reduce the number of BMPs that are included in the project.

Task 1.2 Work Products

- Draft memo with recommendations for categorizing initial list measures:
 - High priority (quality data likely meets Tier 3 conditions),
 - Medium priority (e.g., requires additional data or expert elicitation/good implementation potential), and
 - Low Priority (e.g., lack of data to evaluate and low implementation potential).
- Web-assisted meeting to present draft list of priority BMPs (including those requiring expert elicitation) and discuss with UNRBA/NCDWR
- Incorporate input from UNRBA/DWR and finalize list of priority BMPs
- Finalize documentation for the screening analysis and include in Task 1 memo

1.3 Develop Database for Priority Measures

Subtask 1.3 includes additional research and full database population for the measures selected during Subtask 1.2, where needed. If there are gaps in the data for these selected measures, this Subtask allows for development of an expert elicitation survey to fill in gaps (e.g., effect of local conditions on credits, minimum design standards). This input will be solicited through the NSAB BMP subcommittee which includes experts in the field of BMP implementation and effectiveness (additional appropriate organizations, government agencies, and local jurisdictions will be invited to participate as well). The database will be updated to include the results of the expert elicitation. All data entries will be quality assured prior to commencing subsequent subtasks.

Task 1.3 Work Products

- Memorandum documenting the development and results of the expert elicitation survey

1.4 Assessment of design parameters in credit estimation (specifications will be limited based on the available data)

Subtask 1.4 performs an assessment of the database developed under Task 1.3 to quantify the impacts of design parameters on credits (if sufficient data are available) and to specify the minimum implementation requirements for each measure.

Task 1.4 Assumptions

- Variations in credits based on design parameters will be based on available data

Task 1.4 Work Products

- Meeting with UNRBA/NCDWR to discuss lessons learned from the DWR-funded and NSAB-coordinated Piedmont Triad Regional Council (PTRC) project regarding design parameters
- Develop recommendations for assessing impacts of specifications based on the database
- Develop and participate in a web-assisted meeting to discuss recommendations with UNRBA/NCDWR
- Draft memorandum of design parameters or minimum implementation requirements for each measure
- Conference call with UNRBA/NCDWR to discuss draft memorandum
- Finalize documentation and include in Task 1 memo

1.5 Statistical analyses

Subtask 1.5 includes an assessment of statistical methods typically used to develop credits associated with nutrient reducing measures. This task also includes a review of the data compiled under Task 1.3, a review of applicable statistical methods, preparation of unique datasets for each type or category of measure for up to 25 measures, perform statistical analysis, and develop recommendations on the appropriate statistical methods for the UNRBA and NCDWR. The contractor team will present these recommendations to the UNRBA and NCDWR and incorporate their feedback prior to fully analyzing the datasets and developing the proposed credits.

Task 1.5 Work Products

- Develop and participate in a web-assisted meeting for UNRBA/NCDWR to discuss recommended statistical methods and example results
- Draft memorandum of statistical analyses and results
- Develop and participate in a web-assisted meeting to present results to UNRBA/NCDWR
- Finalize documentation and include in Task 1 memo

1.6 Complete Task 1 Memo and provide database

Subtask 1.6 will summarize in the form of a Technical Memorandum the priority nutrient reduction measures and accompanying work products developed in subtasks 1.2 through 1.5, in addition to planning-level cost estimates that are applicable to the UNRBA member jurisdictions. Recommendations to assign each measure to one of the three Tiers described by NCDWR will be developed. This task also includes finalizing the project documentation associated with Task 1.

Task 1.6 Work Products

- Draft memorandum including costs assessments and recommendations for assigning each measure to one of the NCDWR proposed Tiers
- Develop and participate in a webinar to present results to UNRBA/NCDWR
- Incorporate input from UNRBA/NCDWR; finalize documentation and include in Task 1 memo
- Deliver electronic copy of Task 1 memorandum to UNRBA and NCDWR
- Deliver electronic database (Subtask 1.3) to UNRBA and NCDWR

TASK 2 - Tool Selection and Development (includes both non-optional and optional tasks)

The purpose of this task is to work with the UNRBA to develop a sub-watershed modeling/accounting framework that includes credit calculations for the nutrient reducing measures analyzed in Task 1. This framework and the results of Task 1.2 will dictate the tool(s) that are ultimately developed as part of the remaining sub-tasks under Task 2. Task 2.2 and 2.3 are optional subtasks.

2.1 Develop a modeling framework to supplement current calculation tools

This subtask will include review and selection of the appropriate calculation tool(s) to perform the calculations for the credits developed under Task 1 of this project.

Task 2.1 Work Products

- Meeting with the UNRBA/NCDWR to generate a unified statement of purpose for the calculation tool that is consistent with the available budget for Task 2
- Draft document that compares the JFLSLAT, the WTM, and up to one additional model selected by the UNRBA for comparison and recommends a modeling approach that meets the objectives of the stated purpose of the model.
- Meeting with the UNRBA / NCDWR to discuss the recommended approach and obtain feedback from the group
- A final memorandum documenting the recommended approach. This memorandum will form the basis for the scope of work associated with the Optional tasks 2.2 and 2.3.

2.2 Revise Selected tool(s) for Priority Measures (include nitrogen, phosphorus, and sediment) (Optional)

This subtask will include modifications to the tool(s) selected during subtask 2.1. The available remaining budget, the selected modeling approach/tool, and type of modeling interface (e.g., user friendliness) will dictate the types of revisions that can

be accommodated and the number of BMPs that can be included for revised tool development. For example, the WTM currently includes several of the programmatic BMPs that may be included in this study, while the JFSLAT only includes structural BMPs. The types of BMPs that are developed in Task 1 will need to factor into the decision in tool selection to most efficiently utilize the UNRBA's resources.

Our team will place a higher priority on development of the tool to include the measures for which credits were developed under Task 1 with a lower priority on refining the model interface and developing tool add-ons. This task will operate within the available budget and include any additional funding that is secured in the next fiscal year to support this task. To the extent possible, the majority, if not all of the priority measures (i.e., Tier 3 measures) would be incorporated into the revised tool. Cardno ENTRIX and the Center for Watershed Protection, Inc. will work through these issues with the UNRBA and draft a specific scope of work for this optional task prior to commencing work. The following modifications will be addressed:

- a. Modify Tool(s) for a select number of the priority measures based on available budget and the tool selected in Task 2.1
- b. Refine tool to account for delivery factors
- c. Revise tool to account for local geology

Task 2.2 Work Products (Optional)

- Draft document that summarizes the modifications and development of the credit accounting tool(s)

2.3 Present customized Tool and incorporate feedback (Optional)

This subtask includes development of a web-assisted meeting to present the modified tool(s) to the UNRBA and NCDWR. Feedback from the UNRBA and NCDWR will be used to finalize the draft document submitted under subtask 2.2.

Task 2.3 Work Products (Optional)

- Develop web information/presentation to present revised Tool to UNRBA/NCDWR
- Finalize Task 2 documentation

TASK 3 - Identification of Issues Associated with a Trading Program (screening-level framework includes both non-optional and optional tasks)

The purpose of Task 3 is to identify the regulatory, financial, and logistical constraints of developing a nutrient trading program in the Falls Lake Basin. Only Subtask 3.1 is included in the initial contract: Subtasks 3.2, 3.3, and 3.4 are optional subtasks.

3.1 Identify stakeholders

Subtask 3.1 includes participation by a team member in selected activities related to trading considerations between jurisdictions and the agricultural community. Selected activities may include meetings and sessions that NCDWR may set up with members of the UNRBA, NCDWR, and the WOC to discuss the potential for nutrient trading in the Falls Lake Basin. This subtask also includes discussion with the World Business Council and USEPA regarding participation in a project to explore trading in this basin.

This subtask also includes a meeting with the UNRBA, NCDWR, and the WOC to review the results of the screening level survey developed for Task 1.2. This second meeting will ensure that the measures that are ultimately selected for this project have a reasonable likelihood of being implemented by the agricultural sector, and that the UNRBBA does not fund measures that would not be used by the agricultural community.

Task 3.1 Work Products

- Two meetings, as appropriate, with UNRBA/DWR/WOC to identify stakeholders and project participation levels (DWR, local SWCDs, WOC, NRCS, environmental groups, NPDES dischargers, EPA, WBC, etc.)
- Conference call with EPA and World Business Council to gauge interest in project participation (funding, pre-developed tools, etc.)
- Meeting with UNRBA/DWR/WOC to review results of screening level survey developed for Task 1.2

3.2 Develop preliminary list of issues/data gathering (Optional)

This optional subtask includes research and documentation of the issues regarding development of a nutrient trading program in the Falls Lake Basin. This subtask includes 20 hours of time for the project's lawyer (Susan Bodine) to assist with the regulatory issues. The issues that will be addressed under this task include:

- a. Regulatory constraints (e.g., accounting measures for different sectors)
- b. Economic issues/methods
- c. Logistical constraints
- d. Scaling factors for uncertainty of effectiveness
- e. Accounting for location in the watershed

- f. Identification of potential cost functions by sector (e.g., what drives costs and decisions?)
- g. Potential credit basis (e.g., nitrogen, phosphorus, both?)
- h. Consistency/applicability of mitigation banking procedures
- i. Maintenance and verification requirements

Optional Task 3.2 Work Products

- Information packet for Task 3.3 workshop (background information on trading, preliminary list of issues, description of the workshop format and objectives)

3.3 Workshop with Stakeholders (Optional)

This optional subtask includes development and attendance by Cardno ENTRIX staff at the first of two workshops for the stakeholders in the Falls Lake Basin. The workshop will include the following elements:

- a. Introduction to concepts, structure/rules of the workshop, etc.
- b. Brainstorming pros/cons, issues/opportunities (small group exercise -> present to full group)
- c. Discussions on the preliminary list of issues (small group exercises to flesh out the issues, add to the list, identify potential solutions, etc.)
- d. UVA Nutrient Trading Game (developed for the Chesapeake Bay; assumes no revisions are needed for this exercise)
- e. Identification of next steps, areas of agreement/disagreement

Optional Task 3.3 Work Products

- Conducting workshop for the stakeholders in the Falls Lake Basin

3.4 Develop high-level framework/identification of issues (Optional)

This optional subtask summarizes the efforts and results from Subtask 3.2 and 3.3. The UNRBA and NCDWR will have a chance to review and provide input on the summary prior to submitting the document to the stakeholders in the Basin. The optional subtask also includes a second workshop with the stakeholders to allow input on the draft and assess the likelihood of participation in a trading program.

Optional Task 3.4 Work Products

- Draft memorandum describing the issues and interactions among the issues associated with a nutrient trading program in the Falls Lake Basin
- Submittal to UNRBA/DWR for comment followed by a conference call for discussion
- Incorporation of UNRBA/DWR comments and submittal to stakeholders

- Workshop with stakeholders to allow input on draft and assess likelihood of participation in a trading program
- Finalize Task 3 document to include results of the Task 3.4 workshop

TASK 4 - Additional Meetings / Travel (Assume 2 year contract)

The project managers on this project at Cardno ENTRIX and the Center for Watershed Protection, Inc. will be required to attend additional meetings beyond the technical meetings identified under Tasks 1, 2, and 3.

Work Products for Task 4.

- Attendance by Cardno ENTRIX project manager or designee at bi-monthly UNRBA Board of Director meetings.
- Attendance by Cardno ENTRIX project manager or designee at 50 percent of the remaining NSAB meetings , or other meetings at the direction of the Executive Director, as requested by the UNRBA.
- Attendance by Center for Watershed Protection, Inc. project manager or designee at up to four meetings in person with two meetings budgeted for Task 1, one meeting for Task 2.1, and one meeting associated with the optional Task 2 subtasks as requested by UNRBA.

TASK 5 - Project Management - Assumes 2 year project duration

The Cardno ENTRIX project manager will take the lead role for the management of cost tracking and billing of work effort for the team. The Cardno ENTRIX project manager will prepare and submit an invoice and project status report monthly to the UNRBA Executive Director (or designee) during the project duration. The invoice will provide the details of labor and expense charges by subtask.

The project status report will provide a summary of the budget status, including overall percent spent by task and overall percent spent for the project. Status reports will also identify separately administrative costs for any subcontracts. Additionally, the project status report will provide summaries of work progress, schedule updates, and a description of any contract issues that come up and how they have been resolved. The monthly invoice and project status report will be submitted electronically. The final formats of invoices and monthly status reports shall be approved by the UNRBA Executive Director (or designee) prior to submittal of the first report. Any format changes will need to be approved by the Executive Director (or designee) before changes are implemented.

Progress meetings will be held at the discretion of the UNRBA Executive Director (or designee) to provide summaries of progress-to-date, the project schedule, and to discuss proposed changes or issues needing resolution during the project duration. These progress meetings will typically occur by teleconference or following committee meetings or meetings of the UNRBA Board of Directors. These project meetings are anticipated to average 60 minutes in length.

Work Products for Task 5.

- Monthly project status reports and invoices; progress meetings and conference calls.

Schedule

The following table contains the schedule for task completion, with milestones, from the start of the project. Optional subtasks are shown with blue, hatched bars. Tasks 4 and 5 will continue throughout the contract.

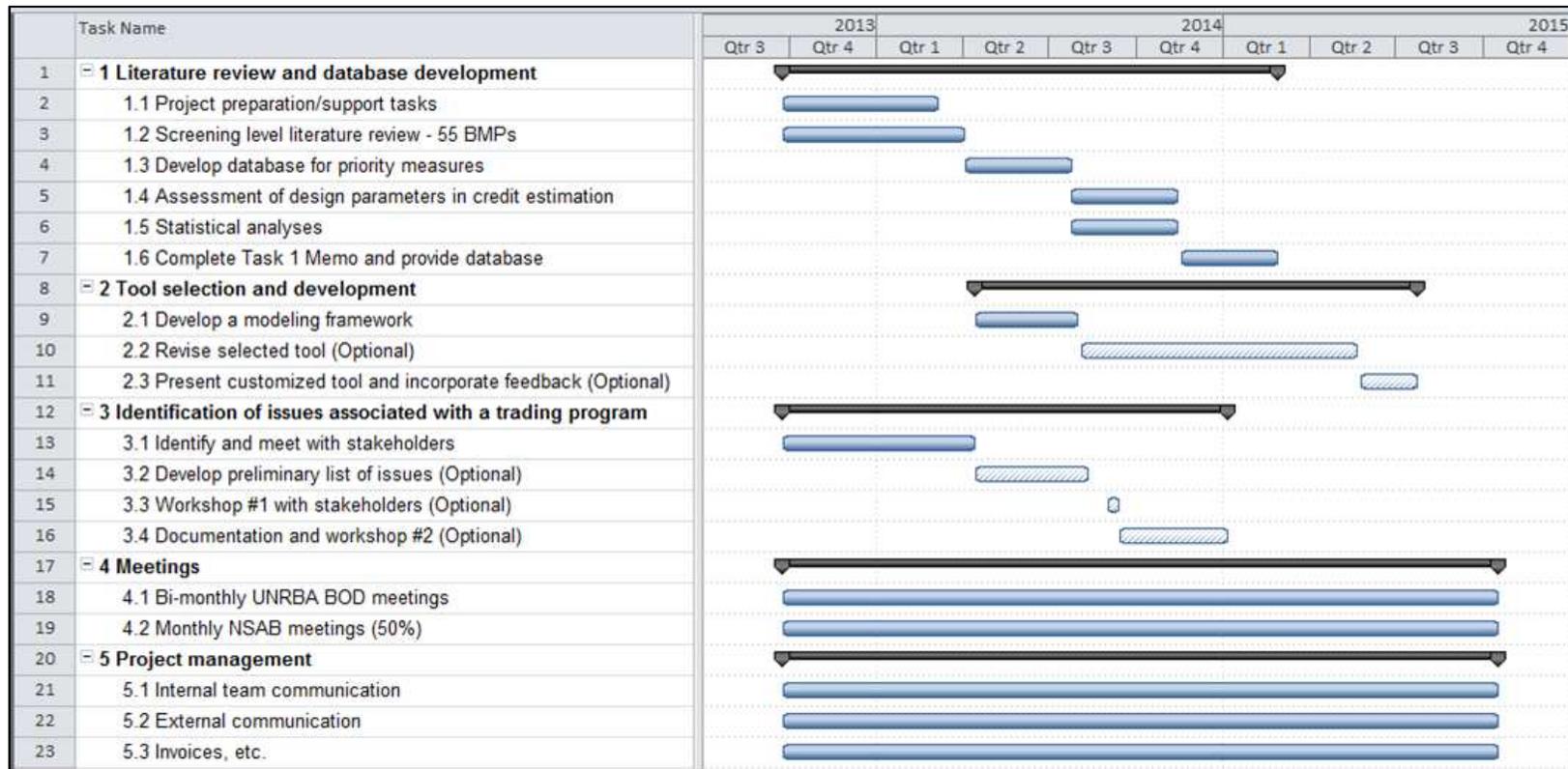


Figure 1. Schedule for the UNRBA Nutrient Credit Project