THE COOPERATIVE MONITORING, EVALUATION AND RESEARCH PROGRAM

WORK PLAN NOTEBOOK

May 1990 Draft

The Cooperative Monitoring, Evaluation, and Research Program

Executive Summary

WORK PLAN NOTEBOOK

for Technical Implementation of the Timber, Fish, and Wildlife Agreement

May 1990 Draft

The Cooperative Monitoring, Evaluation, and Research Work Plan — Executive Summary

Acknowledgements

The Cooperative Monitoring, Evaluation, and Research (CMER) Committee has called on numerous representatives from the timber industry, environmental groups, state and federal agencies, state Indian tribes, and universities for insight and assistance in developing its programs. We express our appreciation to all those who contributed to this process.

Introduction

The Cooperative Monitoring, Evaluation, and Research (CMER) Work Plan

The Cooperative Monitoring, Evaluation, and Research (CMER) Work Plan described in this Executive Summary sets forth guidelines for how to develop and administer both programs and projects connected with the CMER effort. It also details current research programs and specific projects that are aimed at a better understanding of how forestry practices interact with other resources and with the environment in the State of Washington.

The CMER Work Plan is an outgrowth of events that began in the mid-1970's with the passage of the State's Forest Practices Act. A series of events during the next decade led to a set of talks at Port Ludlow in 1986. There, representatives from state agencies, the timber industry, Indian tribes, and environmental groups met to lay the foundation for the Timber, Fish, and Wildlife Agreement. The decisions and the impetus for the TFW Agreement came primarily from these constituency groups.

The Timber, Fish, and Wildlife Agreement

The Port Ludlow talks resulted in a framework for cooperative resource management. From the summer of 1986 until February of 1987, dozens of policy and technical committees made up of a broad spectrum of government, industry, tribal, and environmental-group participants held over 60 meetings to refine an approach. When they finished, they finalized the Timber, Fish, and Wildlife Agreement.

Voluntary, Cooperative

The TFW Agreement is not a legally binding document. It is voluntary and comes from the belief that cooperation leads to better resource management than litigation. It is a commitment by all parties to work together to reach consensus. The result of the Agreement is that some Agreement elements remain voluntary, some have become cooperative, and some have since been written into law and regulations.

The participants in the TFW Agreement include (but are not limited to):

- Private Forest Landowners
- State Agencies — Departments of ...
  - — Natural Resources
  - — Wildlife
  - — Ecology
  - — Fisheries
  - — Labor and Industries
- State Indian Tribes
  - — Columbia River Intertribal Fish Commission
  - — Northwest Indian Fisheries Commission
- Environmental Groups
  - — Washington Environmental Council
  - — Washington Audubon Society
- Forestry Industry
  - — Washington Forest Protection Association
  - — Washington Farm Forestry Association

Timber, Fish, and Wildlife Agreement Goals

Each participant to the Agreement recognizes that the goals of all participants are equally legitimate. As partners in the Agreement, participants have accepted common goals in the following areas:

- Wildlife
- Fisheries
- Water Quality and Quantity
- Archeological and Cultural
- Timber

Key Aspects of the Timber, Fish, and Wildlife Agreement

There are a number of key aspects to the Timber, Fish, and Wildlife Agreement that make it work. These include:

- Defined Decision-Making Process
- Adaptive Management

- Flexibility
- Preplanning
- Resource-Management Plans
- Annual Agreement Evaluations
- Impact on Legislation/Regulation

Defined Decision-Making Process — Agreement participants built a decision-making process that assigns organizational, policy, technical, and field questions to appropriate standing committees made up of specialists in the areas. Larger policy questions are brought before all participants.

Adaptive Management — Resources are managed using the best available information, with the understanding that policies and practices can be changed in response to research and monitoring results. As a key co-founder of the TFW Agreement, timber industry leader Stu Bledsoe coined the phrase "We will go where the truth leads us" to characterize Adaptive Management.

Flexibility — Flexibility comes with both Adaptive Management, which allows managers to incorporate new information into their practices, and with the ability under the Agreement to make site-specific resource management decisions.

Preplanning — Preplanning allows all participants to evaluate long-term resource harvesting plans before the submission of a formal forest-practice application.

Resource-Management Plans — These are voluntary plans that encompass entire watersheds or large resource areas. They provide a strong basis for cooperation among multiple resource managers.

Annual Agreement Evaluations — Annual reviews are used to identify potential issues and conflicts and to evaluate the effectiveness of the Agreement processes. The third and eighth year of the Agreement have been targeted for in-depth reviews of the entire Agreement and the results of its implementation.

Impact on Legislation/Regulation — The TFW Agreement participants make unified recommendations to both the legislature and the Forest Practices Board. TFW Agreement participants represent most of the major constituencies who have an interest in forest practices in Washington.

Tools of the Timber, Fish, and Wildlife Agreement

There are three primary resource-management tools that are at the disposal of participants as part of the Agreement. These tools include:

- Interdisciplinary Teams
- Alternate Planning
- Cooperative Monitoring, Evaluation, and Research

Interdisciplinary Teams — Interdisciplinary Teams are the most frequently used and the most highly visible of the tools. These teams are composed of specialists in areas such as wildlife biology, fisheries, hydrology, soils, geology, and forest engineering.

When the Department of Natural Resources determines that an issue requires additional field review, the issue is given "priority" status. Interdisciplinary Teams are assigned to the issues and are sent to the site to evaluate specific field conditions. After its examination, the

Team makes recommendations to the Department of Natural Resources.

Alternate Planning — Alternate planning means that a landowner may submit an alternate plan for site-specific practices which may vary from those set forth in the regulations. This gives the landowner more flexibility, providing the landowner can clearly demonstrate how the variance will provide equal or better protection of public resources.

Cooperative Monitoring, Evaluation, and Research — Since Adaptive Management is a key aspect of the TFW Agreement, constant research and monitoring of resource practices is necessary in order to provide managers with the most up-to-date information. In addition, since Adaptive Management links resource decisions to local or site-specific conditions, both an in-depth inventory and an in-depth knowledge of the resources represented on all forested areas of the state is extremely important.

The Cooperative Monitoring, Evaluation, and Research program gathers technical information both to evaluate management practices and their effects, and to promote understanding of relevant ecosystem interactions. This program supports the Adaptive Management strategy by building an information base for reviewing and changing current policies and decisions.

Cooperation is a necessity in order to meaningfully monitor and evaluate resources as vast and complex as those found in Washington. To coordinate this effort, TFW Agreement participants formed the Cooperative Monitoring, Evaluation, and Research Committee.

The Cooperative Monitoring, Evaluation, and Research Program

The Cooperative Monitoring, Evaluation, and Research Program's Mission

The mission of the Cooperative Monitoring, Evaluation, and Research Program is to provide information that will: 1) help evaluate the TFW Agreement's effectiveness, and 2) offer a framework for Adaptive Management. The CMER Program is designed to answer questions about how forest practices affect public resources. It has several key purposes, including:

- Examining ways in which forestry activities such as timber harvest and road construction impact fish, wildlife, and water quality.
- Providing the technical and informational framework for making and evaluating resource- management decisions.
- Promoting understanding of ecosystem interactions.

The Cooperative Monitoring, Evaluation, and Research Program's Objectives

In responding to the CMER Program's mission, its objectives include providing TFW Agreement managers, policy makers, and regulators with information in the following categories:

- The success of different elements of the TFW Agreement in protecting public resources.
- The validity of those assumptions that form the basis for current regulations and proposed resource management alternatives.
- The most reliable methods for helping resource managers assess and reduce the risks connected with forest practices.

The outcome of accomplishing these objectives should be a set of practical procedures that will: 1) improve the management of forests and other public resources, and 2) provide the basis for Adaptive Management strategies.

Research in Support of Adaptive Management

As mentioned earlier, the need and the design of the Cooperative Monitoring, Evaluation, and Research (CMER) Program were both identified as an outgrowth of the Timber, Fish, and Wildlife Agreement. Many of the CMER Program's aspects are geared toward the concept of Adaptive Management as outlined in the TFW Agreement — managing resources using the best available information, with the understanding that policies and practices should be changed in response to research and monitoring results.

Explicit Objectives — Adaptive Management seeks a balance between resource use and protection, and is best applied where resources are managed for explicit objectives. It becomes more of a challenge to apply in the face of competing or undefined objectives.

Link to Local Conditions — Adaptive Management also means linking resource practices and decisions to local conditions. An example is salmon harvest quotas that are now set according to population monitoring data. Regulatory measures — which have the efficiency of being easily applied and uniformly enforceable — are insensitive to the widely ranging geographic and ecosystem zones found in the state. For example, stipulations for riparian zone management must take into account that various stream types within the same watershed may respond differently to silvicultural treatments.

In addition, regulation is often influenced by interest groups who argue for use prescriptions which serve their parochial needs. Therefore, Adaptive Management techniques — supported by the CMER process — that tailor use prescriptions to specific sites promise better overall resource use and protection.

The CMER Committee

Its Role and Responsibility — The CMER Committee — as the technical arm of the Timber, Fish, and Wildlife Agreement — is responsible for administering the design, implementation, and review of the CMER program. The CMER Committee's role may also include answering technical questions relating to the TFW Agreement, providing technical services to TFW Agreement participants, and reviewing relevant technical and scientific information.

The CMER Committee also has primary responsibility as part of the CMER Program mission for providing the unifying framework for monitoring and research projects. Such a framework must impart a clear understanding to all Agreement participants of how proposed projects complement each other to form an integrated monitoring program that is responsive to the needs of Adaptive Management.

Its Direction — The CMER Committee receives its direction from the TFW Agreement Administrative Committee (See Figure 1), and reports results back to it.

Its Members — The CMER Committee is composed of representatives from a number of TFW Agreement participants along with others interested in the research aspects of the TFW Agreement.

Its Structure — The Committee is made up of the main committee, along with several sub groups which include:

- Technical Steering Committees
  - Implementation Coordinator
- Cochairs of the Steering Committees
- Contract Administrator

Technical Steering Committees — There are currently five Technical Steering Committees which include:

- Fisheries
- Wildlife
- Water Quality
- Ambient Monitoring
- Sediment, Hydrology, Mass Wasting

These five Technical Steering Committees each consist of a core of eight members, ensuring representation of the TFW constituencies, along with other interested parties, usually from technical backgrounds. Technical Steering Committees handle a number of functions, including:

- Technical implementation of the projects and sub-programs identified as part of the CMER process.
- Technical review of study plans and proposals.
- Technical assessment of ongoing projects, whether cooperative or contracted research.

Ties

The CMER Program has a number of ties or links to other TFW Agreement groups along with government agencies or oversight boards. These ties are normally made by the CMER Committee, and include links with:

- The TFW Administrative Committee
- Four Other TFW Standing Committees...
  - — The TFW Training, Information, and Education Committee
  - — The TFW Field Implementation Committee
  - — The TFW Cultural/Archeological Committee
  - — The TFW Information Management Committee
- The State Forest Practices Board
- The TFW Agreement Policy Group
- Other Resource Management Planners

The CMER Work Plan

The CMER Work Plan was developed to help provide a unifying framework for sub-programs and projects in support of CMER's activities.

The Work Plan will help ensure that projects are:

- Scientifically sound
- Properly documented
- Evaluated using equal standards
- Coordinated so that information is readily accessible

The CMER Work Plan covers a number of issues and guidelines connected with both Sub-program Management and Project Management, as well as details on key current projects.

Sub-Program Management

Sub-program plans unify related research projects. Because TFW Agreement decision-makers may use research and monitoring information in a variety of policy and field contexts, it is important that they take an active role in developing CMER products within the context of the sub-programs.

Sub-program management means that the CMER Committee must develop and guide each Sub-program to satisfy the objectives of the TFW Agreement participants who are trying to resolve an issue. It also means that TFW Agreement managers must take an active role in guiding the CMER program's direction. In addition, information and results connected with sub-programs must be communicated to the TFW Agreement participants efficiently and in a readily understandable way.

Sub-Program Development — The success of the Sub-programs is based on mutual commitment:

- The commitment of the CMER Committee or CMER Technical Steering Committees to deliver useful information to the TFW managers.
- The commitment of the TFW Agreement managers to incorporate the information into their resource management decisions and practices.

Sub-programs must also be developed with certain principles in mind. They must:

- Reflect solid understanding of the TFW issues.
- Be conceptually grounded in an understanding of the appropriate resource systems.
- Focus on useful, management-oriented resource information.

Sub-Program Plan Evaluation — The CMER Committee has developed a formal set of evaluation criteria and procedures for Sub-program plan evaluation. These are covered in detail later in this section of the Work Plan.

Sub-Program Approval — All sub-programs must be developed in cooperation with the participating TFW Agreement managers. Final approval of all CMER sub-programs must come from the TFW Agreement Administrative Committee, which oversees all CMER Committee activities.

Sub-Program Administration — The CMER Committee works with the Technical Steering Committees to make certain that Sub-programs meet CMER Program and TFW Agreement objectives. The CMER Committee also:

- Coordinates Sub-programs (and projects) to eliminate duplicate efforts.
- Develops guidelines and evaluation criteria for the projects.
- Supports the Technical Steering Committees in the area of sub-program development and implementation, contract administration, financial management, and information management.

Communicating Sub-Program Information — The CMER Committee works closely with the TFW Training, Information, and Education Committee in the areas of reporting, application recommendations, technology transfer, and education associated with the Sub-programs. However, communication is also emphasized between CMER and all TFW participants.

Communicating Sub-Program Information

The CMER Committee has a wide range of communication responsibilities to a varied audience. There is a core communication responsibility, however, that must be carefully

fulfilled. There are four primary areas where the CMER Committee must communicate information both about the CMER Program and research results that come out of the program. These four areas include:

1. Giving other TFW Agreement entities information and a certain degree of training that is derived from Sub-program results.

   As part of this process, the CMER Committee will rely on its Technical Steering Committees for guidance concerning communication strategies and relevant audiences.

2. Recommending policy changes to the Administrative Committee based on research and monitoring information.

   The goal for the CMER Committee is to make these recommendations based on a consensus of those involved. If, however, consensus can't be reached and the recommendation must go forward, the CMER Committee will present opposing opinions, a range of options, and the rationale behind those options.

3. Letting other TFW Agreement entities know about new resource management tools that are developed as part of the CMER Program.

   Information concerning these tools will include situations where they can be appropriately applied and the limitations on their use. As part of this communication process, the CMER Committee will work closely with the TFW Field Implementation- and the Training, Information, and Education Committees to develop the proper training for the tools' field use.

4. Providing guidance to other TFW Agreement committees on how to interpret the results of CMER Program research and monitoring.

   This communication work includes helping TFW participants develop the procedures to share information with the public — and to make sure that all information carries with it any caveats that are indicated by the evaluation.

Project Management

The Project Management portion of the CMER Work Plan is made up of the following six sections:

1. Overview of Project Procedures
2. Project Development
3. Project Approval
4. Project Administration
5. Project Evaluation
6. Communicating Project Information

Overview Of Project Procedures

Projects are developed within the framework of a specific Sub-Program that is aimed at resolving a resource management issue. The Sub-Programs serve to unify related projects in terms of their expected products and their timing. They also identify key interim steps and decision points between individual projects.

There are a number of procedures associated with project development, approval, implementation, and evaluation. They include:

- Project Development — including Project Scoping, writing and issuing a Request for Proposal (if applicable), and submission of draft study plans for the project.
- Project Evaluation — The project is evaluated both at the draft study plan phase (as mentioned), and during its progress as the technical steering committee associated with the project reviews interim reports.

  The evaluation process involves three elements:

  1) The Technical Steering Committee evaluates the study plan for technical merit. This evaluation follows general CMER criteria pertaining to both TFW criteria and technical criteria (criteria follow in this section).
  2) There is a TFW Technical Review session. TFW participants and invited guests review draft plans or reports.
  3) There is independent peer review. Study plans or reports should be reviewed by two or more independent referees selected from the CMER Technical Advisory Board.
- Project Approval — following technical review of the study plan and revisions of the plan as a result of the review. The revised plan is then approved by CMER.
- Project Administration — The approved study plan becomes the guiding document for the project. Administration also includes the development of an

administration plan, and review of any interim technical reports that are required by the project study plan.

- Communicating Project Information — The technical steering committee responsible for the project must develop a communication plan for disseminating the results of the project, and submit that plan to the CMER Committee before it submits its final project report.

Current Project List

The CMER Work Plan also includes a section that contains the current slate of projects that are being carried out as part of the CMER Program. This section details the rationale, the projected products, the budget, and the timeline for each project, along with other pertinent information.

Publication Availability

This Executive Summary will be revised and published annually to provide insight into CMER progress and an updated look at where various projects stand. This Executive Summary will be sent to state and federal legislators, along with foundations and organizations which contribute to Timber, Fish, and Wildlife (TFW) research and monitoring efforts. The Summary will also be provided to all TFW Agreement participants and other interested parties.

A three-ring binder version of the Work Plan is available to Cooperative Monitoring, Evaluation, and Research members as well as steering committee members. This binder form will make it easy to update information and extract pertinent sections as required. A bound version is available for all other interested parties.

For additional copies of this Executive Summary or a copy of the Work Plan, contact:

Timber, Fish, and Wildlife Agreement Archives
Forest Regulations and Assistance Division
Washington State Department of
Natural Resources
Mail Stop EL-03
Olympia, WA 98503
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As part of developing this Work Plan, the Cooperative Monitoring, Evaluation, and Research (CMER) Committee used both the Steering Committees and the CMER Committee chairs and cochairs to arrive at integrating the initial 19 projects into a program. They also helped us respond to new requirements that were raised by independent research reviews, field managers, and Resource Management Plans. Jim Currie facilitated and documented the cochairs' discussions on project integration, and his work served as the springboard for this Work Plan.

The CMER Committee also thanks the ad hoc writing group that worked so hard to bring this workplan through the first of several drafts. That group was made up of Kate Sullivan, Judy Turpin, Peter Haug, Stephen Bernath, Pamela Knudsen, and Dennis McDonald.

A number of steering committee members quickly adapted to a new set of guidelines, procedures, and formats as they worked to complete the descriptions of the subprograms and projects. They also deserve thanks for their efforts.

Finally, the CMER Committee thanks those contractors, consultants, and cooperators who have or will conduct the proposed projects. Their work is vital if we are to go where the truth takes us.

Preface

This revision of the Cooperative Monitoring, Evaluation, and Research Committee's Work Plan describes how the technical aspects of the Timber, Fish, and Wildlife Agreement will be implemented. The Committee has also developed an Executive Summary that covers this material at the overview level.

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Introduction

This Work Plan outlines research and monitoring procedures along with specific projects that will lead to a better understanding of how forestry practices interact with other resources and with the environment in the State of Washington. The Work Plan is an outgrowth of events that began in the mid-1970's with the passage of the State's Forest Practices Act.

This Act was passed to establish a comprehensive regulatory program and to help resolve tough and politically sensitive resource management questions that crossed numerous jurisdictional boundaries. However, a number of interceding steps were necessary before the Act's intent was effectively implemented at the resource level.

The Washington State Forest Practices Act

In 1974, the Washington State Legislature passed the Forest Practices Act (FPA) which sets the regulatory goals required by the legislature. It was intended to regulate forestry practices on all nonfederal forest land (both state and private) within Washington. The act established a permit system for activities that included timber harvest, reforestation, road construction and maintenance, and chemical use on forest lands.

In addition, the Act established the Forest Practices Board. The Board's charter was to:

- Oversee implementation of the Forest Practices Act and recommend revisions
- Protect public resources

A Tough Charter

The Board soon recognized that it was being asked to make policy decisions or recommendations for changes to the Act based on conflicting or inadequate technical information.

In addition, the timber industry, environmental groups, and Indian tribes spent considerable time and energy applying opposing pressures on the Board, and litigation accompanied or forced many decisions.

Indian tribes were continuing their court fight over fishing treaty rights established as part of the "Boldt" decision in 1974. Meanwhile, in 1979, environmental groups demonstrated their influence by winning the "Classic U" case which forced all major Department of Natural Resources timber sales to undergo State Environmental Policy Act review. Battle lines were being drawn.

A New Approach Emerges

Uncertainty about the long-term implications of the Boldt decision prompted representatives from business, industry, and agriculture to form the Northwest Water Resources Committee. The intent was to evaluate tribal positions and start resolving problems *outside* the courtroom. This first effort spawned the Northwest Renewable Resources Center, which had: 1) a much broader charter than that of the Northwest Water Resources Committee, and 2) a larger number of participants.

The Northwest Renewable Resources Center proposed a set of ground rules for resolving resource management issues through consensus or negotiation. The aim was to eventually establish cooperative, participative management of state timber, fisheries, wildlife, and water resources.

Toward this end, in the summer of 1986, the Northwest Renewable Resources Center facilitated a set of talks at Port Ludlow. Representatives from state agencies, the timber industry, Indian tribes, and environmental groups met there and laid the foundation for the Timber, Fish, and Wildlife Agreement. The decisions and the impetus for the Agreement came primarily from these constituency groups.

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The Port Ludlow talks resulted in a framework for cooperative resource management. From the summer of 1986 until February of 1987, dozens of policy and technical committees made up of a broad spectrum of government, industry, tribal, and environmental-group participants held over 60 meetings to refine an approach. When they finished, they finalized the Timber, Fish, and Wildlife Agreement.

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- Wildlife
- Fisheries
- Water Quality and Quantity
- Archeological and Cultural
- Timber

Wildlife — Provide the greatest habitat diversity (particularly riparian, wetlands, and old growth) and assure the greatest specie diversity within those habitats.

Fisheries — Provide long-term habitat protection for natural and wild fish and protect hatchery water supplies.

Water Quality and Quantity — Protect the water needs of people, fish, and wildlife.

Archeological and Cultural — Develop a process to inventory archeological cultural spaces in management forests; inventory, evaluate, preserve, and protect traditional cultural and archeological spaces; and assure tribal access.

Timber — Assure the continued growth and development of the state's forest-products industry which has a vital stake in the long-term productivity of both the public and private forest land base.

Key Aspects of the Timber, Fish, and Wildlife Agreement

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- Flexibility
- Preplanning
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Defined Decision-Making Process — Agreement participants built a decision-making process that assigns organizational, policy, technical, and field questions to appropriate standing committees made up of specialists in the areas. Larger policy questions are brought before all participants.

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When the Department of Natural Resources determines that an issue requires additional field review, the issue is given "priority" status. Interdisciplinary Teams are assigned to the issues and are sent to the site to evaluate specific field conditions. After its examination, the Team makes recommendations to the Department of Natural Resources.

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Cooperative Monitoring, Evaluation, and Research — Since Adaptive Management is a key aspect of the TFW Agreement, constant research and monitoring of resource practices is necessary in order to provide managers with the most up-to-date information. In addition, since Adaptive Management links resource decisions to local or site-specific conditions, both an in-depth inventory and an in-depth knowledge of the resources represented on all forested areas of the state is extremely important.

The Cooperative Monitoring, Evaluation, and Research program gathers technical information both to evaluate management practices and their effects, and to promote understanding of relevant ecosystem interactions. This program supports the Adaptive Management strategy by building an information base for reviewing and changing current policies and decisions.

Cooperation is a necessity in order to meaningfully monitor and evaluate resources as vast and complex as those found in Washington. To coordinate this effort, TFW Agreement participants formed the Cooperative Monitoring, Evaluation, and Research Committee.

The Cooperative Monitoring, Evaluation, and Research (CMER) Committee has developed this Work Plan which contains recommendations for study projects, scheduling for those projects, and funding sources.

Early Results From the TFW Agreement

There were some early benefits that resulted from the TFW Agreement. These included:

- Department of Natural Resources Reorganization
- Reduced Cost for the Timber Industry
- Recognition of Indian Concerns
- Partnership for Environmental Groups
- Expanded Protection for Riparian Zones
- Establishment of Upland Management Areas

Department of Natural Resources Reorganization — The Department reorganized to more clearly delineate between the regulatory and the timber-management functions, and increased the technical training for decision makers.

Reduced Cost for the Timber Industry — The timber industry expects that costs will be reduced because of the predictability and consistency of regulation, and the ability to better manage on a site-by-site basis.

Recognition of Indian Concerns — The tribes gained the opportunity to become an integrated part of the decision-making process and got formal recognition of their interest in protecting natural, archaeological, and cultural resources.

Partnership for Environmental Groups — They have been accepted as equal partners in the TFW Agreement decision-making process. They have also come to realize they share many common values with the timber industry, including the desire for an adequate forest base and a healthy timber industry.

Expanded Protection for Riparian Zones — Riparian protection was given a boost by the establishment of Riparian Management Zones along the banks of streams, rivers, and lakes.

Establishment of Upland Management Areas — These newly designated areas provide for better management of wildlife habitat in upland watersheds.

The Cooperative Monitoring, Evaluation, and Research Program

Background

The Cooperative Monitoring, Evaluation, and Research Program is designed to answer questions about how forest practices affect public resources. It has several key purposes, including:

- Examining ways in which forestry activities such as timber harvest and road construction impact fish, wildlife, and water quality.
- Providing the technical and informational framework for making and evaluating resource- management decisions.
- Promoting understanding of ecosystem interactions.

Research in Support of Adaptive Management

As mentioned earlier, the need and the design of the Cooperative Monitoring, Evaluation, and Research (CMER) Program were both identified as an outgrowth of the Timber, Fish, and Wildlife Agreement. Many of the CMER Program's aspects are geared toward the concept of Adaptive Management as outlined in the TFW Agreement — managing resources using the best available information, with the understanding that policies and practices should be changed in response to research and monitoring results.

Explicit Objectives — Adaptive Management seeks a balance between resource use and protection, and is best applied where resources are managed for explicit objectives. It becomes more of a challenge to apply in the face of competing or undefined objectives.

Link to Local Conditions — Adaptive Management also means linking resource practices and decisions to local conditions. An example is salmon harvest quotas that are now set according to population monitoring data. Regulatory measures — which have the efficiency of being easily applied and uniformly enforceable — are insensitive to the widely ranging geographic and ecosystem zones found in the state. For example, stipulations for riparian zone management must take into account that various stream types within the same watershed may respond differently to silvicultural treatments.

In addition, regulation is often influenced by interest groups who argue for use prescriptions which serve their parochial needs. Therefore, Adaptive Management techniques — supported by the CMER process — that tailor use prescriptions to specific sites promise better overall resource use and protection.

Decisions as Experiments — In an effort to maintain a balanced resource management approach, Adaptive Management treats site-specific management decisions themselves as experiments. Balanced resource use is achieved by using CMER Program methods and projects to weigh the effects of those decisions. Feedback from the CMER process is then factored in as management practices are adapted in response to up-dated research information and changing field conditions.

Not a Panacea — Although Adaptive Management offers great opportunities for meeting resource objectives, it is impossible for all resource decisions to be made through this process. Adaptive Management is information intensive, making it more time consuming and costly than more broadly applied regulatory approaches.

In addition, it often requires greater knowledge of current resource conditions than is readily available. However, moving toward Adaptive Management as a goal will develop valuable tools and information, and in the long run, will produce better management options for all resources.

Leading Toward the Future

The Cooperative Monitoring, Evaluation, and Research Program is a key step toward gathering the information that will help resource managers make the best resource decisions. Even though the Program is relatively new, it is already contributing to making the concept of Adaptive Management a reality. As the Program continues, it will provide both the tools and information to make future resource management decisions both informed and balanced.

The Cooperative Monitoring, Evaluation, and Research Program's Structure

Guidance

The Cooperative Monitoring, Evaluation, and Research (CMER) Program is under the guidance of the CMER Committee. This committee is tied to the Timber, Fish, and Wildlife Agreement implementation through a reporting structure that includes the TFW Agreement Administrative Committee and the TFW Agreement Policy Group. This reporting structure is shown in Figure 1.

[Insert Figure 1 here]

CMER Committee

Its Role — The CMER Committee — as the technical arm of the Timber, Fish, and Wildlife Agreement — is responsible for administering the design, implementation, and review of the CMER program. The CMER Committee's role may also include answering technical questions relating to the TFW Agreement, providing technical services to TFW Agreement participants, and reviewing relevant technical and scientific information.

Its Direction — The CMER Committee receives its direction from the TFW Agreement Administrative Committee (See Figure 1), and reports results back to it.

Its Members — The CMER Committee is composed of representatives from a number of TFW Agreement participants along with others interested in the research aspects of the TFW Agreement.

Its Structure — The Committee is made up of the main committee, along with several sub groups which include:

- Technical Steering Committees
  - — Implementation Coordinator
- Cochairs of the Steering Committees
- Contract Administrator

Technical Steering Committees — There are currently five Technical Steering Committees which include:

- Fisheries
- Wildlife
- Water Quality
- Ambient Monitoring
- Sediment, Hydrology, Mass Wasting

These five Technical Steering Committees each consist of a core of eight members, ensuring representation of the TFW constituencies, along with other interested parties, usually from technical backgrounds. Committee chairs can be selected from among the Committee members or appointed by the CMER Committee.

Technical Steering Committees handle a number of functions, including:

- Technical implementation of the projects and subprograms identified as part of the CMER process.
- Technical review of study plans and proposals.
- Technical assessment of ongoing projects, whether cooperative or contracted research.

An Implementation Coordinator for each Technical Steering Committee is assigned to oversee the implementation and progress of specific research or monitoring projects. There is one coordinator assigned to each project. The Coordinator acts as the liaison between the Technical Steering Committee, the project contractors or managers, and the Contract Administrator.

Cochairs — Cochairs from both the CMER Committee and the Technical Steering Committees serve on ad hoc groups to develop committee procedures, operations recommendations, budgets, and agendas, along with sorting out project overlaps and duplications. The cochairs are asked to serve an overlapping two-year term.

Contract Administrator — The Contract Administrator for the CMER Committee is usually a representative from the State Department of Natural Resources. The Administrator prepares and administers contracts based on: 1) state contracting/funding guidelines, and 2) information from the appropriate Technical Steering Committee.

Ties

The CMER Program has a number of ties or links to other TFW Agreement groups along with government agencies or oversight boards. These ties are normally made by the CMER Committee, and include links with:

- The TFW Administrative Committee
- Four Other TFW Standing Committees ...
  - — The TFW Training, Information, and Education Committee
  - — The TFW Field Implementation Committee
  - — The TFW Cultural/Archeological Committee
  - — The TFW Information Management Committee
- The State Forest Practices Board
- The TFW Agreement Policy Group
- Other Resource Management Planners

The TFW Agreement Administrative Committee — The Administrative Committee provides day-to-day management of the TFW Agreement. It frames and recommends modifications to the Agreement, policy measures, and priorities to the Policy Group, and oversees the TFW budgets and staff. The CMER Committee reports directly to the Administrative Committee.

Four Other TFW Standing Committees — These committees, along with the CMER Committee, report to the TFW Agreement Administrative Committee (See Figure 1).

The TFW Training, Information, and Education Committee — This committee conducts information and education projects based on the needs of TFW Agreement participants. They coordinate and integrate media projects, review and coordinate training programs, and work with public groups who are not direct TFW Agreement participants. The CMER Committee uses this committee as a source of expertise in assuring that research results are made visible in a readily understandable manner.

The TFW Field Implementation Committee — This committee helps implement provisions of the TFW Agreement and the Forest Practices Act, along with other applicable regulations. They define implementation issues, evaluate implementation practices, and improve cooperative compliance. In addition, they deal with a number of statewide resource issues and work closely with other TFW Agreement committees. The CMER Committee works with them for review and testing feedback as well as to ensure that research data is smoothly transferred to interested parties.

The TFW Cultural/Archeological Committee — This committee's main charter is to develop systems and processes that will protect cultural resources. They serve as a forum for education, and act as a role model for resolving cultural resource management conflicts. They also serve as advocates for cultural resource protection in the state legislature and state agencies. CMER Committee interactions with this committee have not yet been defined.

The TFW Information Management Committee — This committee is made up of administrators with expertise in data management. They establish data priorities, set data standards, coordinate data collection, and oversee quality control. The CMER Technical Steering Committee that handles

information management will work with this committee to share ideas for integrating information concepts throughout the TFW Agreement environment.

The State Forest Practices Board — The Forest Practices Board was created as part of the Forest Practices Act of 1974 to administer Forest Practices Rules and Regulations. The CMER Committee reports information up through the TFW Agreement structure to the Forest Practices Board.

The TFW Agreement Policy Group — This Policy Groups acts as a Board of Directors for the TFW Agreement participants, conducting strategic planning, setting priorities, and establishing funding levels. It also interprets and modifies the TFW Agreement. It provides the link to the state legislature, the Forest Practices Board, and the public. The CMER Committee reports to the Policy Group through the Administrative Committee.

Resource-Management Planners — A number of local interested parties have become active in putting together Resource Management Plans. Two Resource Management Plans being done under TFW Agreement guidelines are underway: 1) on the Nisqually and 2) in the Upper Yakima River basins. The CMER Committee has assigned members as liaisons to each process to monitor the progress and see if individual Technical Steering Committee members might be able to help with research or monitoring efforts or projects.

The Cooperative Monitoring, Evaluation, and Research Program's Mission

The mission of the Cooperative Monitoring, Evaluation, and Research Program is to provide information that will: 1) help evaluate the TFW Agreement's effectiveness, and 2) offer a framework for Adaptive Management. Research and monitoring carried out as part of the Program will require the careful application of scientific procedures and testing of each hypothesis. The goal is to answer questions concerning specific forest practices and their impact on resources such as fisheries, wildlife, and water.

The CMER Committee's Responsibility

The CMER Committee has primary responsibility as part of the CMER Program mission for providing the unifying framework for monitoring and research projects. Such a framework must impart a clear understanding to all Agreement participants of how proposed projects complement each other to form an integrated monitoring program that is responsive to the needs of Adaptive Management. This Work Plan was developed to help provide such a framework.

The Work Plan will help ensure that projects are:

- Scientifically sound
- Properly documented
- Evaluated using equal standards
- Coordinated so that information is readily accessible

The Cooperative Monitoring, Evaluation, and Research Program's Objectives

In responding to the CMER Program's mission, its objectives include providing TFW Agreement managers, policy makers, and regulators with information in the following categories:

- The success of different elements of the TFW Agreement in protecting public resources.
- The validity of those assumptions that form the basis for current regulations and proposed resource management alternatives.
- The most reliable methods for helping resource managers assess and reduce the risks connected with forest practices.

The outcome of accomplishing these objectives should be a set of practical procedures that will: 1) improve the management of forests and other public resources, and 2) provide the basis for Adaptive Management strategies.

The Cooperative Monitoring, Evaluation, and Research Program's Approach

The Cooperative Monitoring, Evaluation, and Research Committee understands that the effectiveness of the CMER program depends on two primary factors:

- A well-defined planning process
- A solid administrative framework

CMER Program Planning

The planning process for the CMER Program starts with a resource management issue that TFW Agreement participants want to resolve. For example, those issues identified as part of the TFW Agreement resulted in the 19 projects that made up the initial CMER Program. These 19 projects were supported by funding from both the State legislature and contributions from TFW Agreement participants.

Since then, new issues have been brought forth for CMER Program consideration. These issues have come from a number of sources, including:

- Forest Practices Board
- TFW Field Implementation Committee
- Resource Management Plans
- Interdisciplinary Teams
- Field Managers

Sub-Programs — Once issues have been identified and defined, a CMER Sub-program may be set up for that issue. Research projects are then defined and implemented within that Sub-program to gather the information needed for sound decision making. Figure 2 shows how this process works.

[Insert Figure 2 here]

Defining Needs — TFW Agreement managers and regulators work with CMER Committee members to define the information they need from research or monitoring projects. These needs generally fall into one of four main categories:

1. Information concerning resource relationships or processes where there is a lack of basic understanding.
2. Specific information — such as landslide hazard zones — that may be needed in order to do site- specific planning.
3. Knowledge of how specific regulations or management activities (such as the creation of Upland Management Areas) are achieving TFW Agreement objectives.
4. An assessment of the overall effectiveness of the TFW Agreement in meeting both timber and other public resource goals.

Information needs vary not only by management process, but also by decision-making role. For example, field managers should be able to predict system response in order to develop the best management solutions. This may mean assessing hazards and risks, then using management prescriptions when regulations don't apply. Therefore, field managers need information that will let them evaluate the effectiveness of those management prescriptions.

There are other examples of varying information needs:

- Field Managers and regulators need good decision criteria — such as biological standards and goals — if they are to weigh resource decisions.
- Policy makers that oversee both the regulators and the field managers need assurance that resource management processes have adequately met their resource criteria.

Figure 3 shows examples of decision tools and how they are used by different decision makers.

Once needs are identified, projects are set up to develop management decision tools such as decision criteria or resource standards. Managers use these tools both to improve resource management and to evaluate the TFW Agreement process.

Linking Issues and Knowledge — Once managers have defined their needs for tools and information, a five-stage strategy is used to develop resource management techniques and standards that can be applied with a reasonable degree of confidence. These stages include:

1. Scoping
2. Monitoring or Research
3. Technical Trials
4. Broadened Application
5. Implementation

Scoping — Once management needs are identified, CMER Committee members initiate a scoping effort to find out the state of knowledge surrounding the issue or problem. If management tools are already available, they are presented to the appropriate TFW Agreement participants.

Monitoring or Research — If current knowledge of the issue or problem is insufficient, the CMER Committee can set up targeted research or monitoring projects. The goal of these projects is to develop pilot management methods and standards. Uniform standards and criteria for conducting research are objectives for all projects within the CMER Program.

For a flexible or Adaptive Management approach as described in the TFW Agreement, research may be targeted at such areas as:

- Models that describe the resource system and predict results with reasonable confidence.
- Resource inventory information specific to a location (including sensitivity indicators for certain resources).
- Management techniques that have proven effective when applied in similar circumstances.

Technical Trials — When pilot management methods have been designed through the CMER process or taken from other sources, they must be evaluated and improved in a series of field trials. Methods are assessed for:

- Technical validity
- Feasibility
- Effectiveness as part of the TFW Agreement process

Field trials are very often controlled, experimental, and done in a limited geographic area. Until methods have been field tested and validated, they will not be used on a broad scale.

Broadened Application — Once methods have passed a set of field trials, they will be evaluated on a wider scale. Sometimes methods work well when used by specialists or when applied on a limited basis but don't make the transition to wide use by TFW Agreement participants. Refinements are often necessary before the methods can be released for general implementation. One of the CMER Committee's roles is to help the Field Implementation Committee and other TFW groups get involved at this stage.

Implementation — Once methods have been shown to work on a broad scale, they can be put into practice by TFW Agreement participants.

Another view of this process is shown in Figure 3. The process starts with the level of technical knowledge that exists concerning an issue and links that knowledge to three other areas:

1) Field evaluation and testing techniques
2) The purpose of the evaluation
3) The level of confidence that a manager would have in applying research information at various levels of understanding.

[Insert Figure 3 here]

CMER Program Administration

As shown in the section on the CMER Program structure, the CMER program is administered by the CMER Committee, with direct oversight from the TFW Agreement Administration Committee. The CMER Committee Chair works with a number of associates within the committee to make certain that administration supports committee goals. These associates include:

- Cochairs
- Technical Steering Committee Chairs and Implementation Coordinators
- Contract Administrator

The CMER Committee supports the Technical Steering Committees on matters regarding contract administration, program direction, internal information management, financial budgeting and accounting, and internal evaluation.

CMER Approach Summary

No matter how good the approach, adopting new ideas that can by universally applied as part of the TFW Agreement forest-management process is likely to be a difficult task. It is reasonable to assume that new ideas will meet resistance.

Initially, confidence and willingness to accept risk are often low, and concern that changes will be set in concrete are high. These justifiable fears can be overcome by developing ideas into validated methods on a limited scale, then through evaluation, revising them to apply across a broader spectrum. Gradually, these new, more effective resource management methods can be incorporated into TFW Agreement management strategies with increasing confidence.

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Procedure and Guideline Overview

This section of the Cooperative Monitoring, Evaluation, and Research (CMER) Work Plan provides detailed procedures and guidelines for participants in the CMER Program. These procedures and guidelines should be used to help design, plan, and approve monitoring and research Sub-programs and projects. They will also prove useful in understanding how projects fit into the overall CMER Program framework.

Two-Part Section

After a short introduction that looks at the background behind the CMER Program and the role of the CMER Committee, this section contains a detailed breakdown of how Sub-programs and projects are defined and managed. This section is broken down into two parts:

1. Sub-program Management Guidelines. These are oriented toward members of the CMER and Administrative Committees who have the responsibility for developing Sub- programs that meet overall TFW Agreement objectives. These guidelines cover such areas as:
    - Sub-program Development
    - Sub-program Plan Evaluation
    - Sub-program Approvals
    - Sub-Program Administration
    - Communicating Sub-program Information

2. Project Management Guidelines. These are oriented toward Technical Steering Committee members who have responsibility for developing and implementing both monitoring and research projects. They primarily cover:
   - Project Development
   - Project Approvals
   - Project Administration
   - Project Evaluation
   - Communicating Project Information

Recap

Because this section can be used as a stand-alone document, some of the material in this overview may recap more detailed material found in previous parts of this CMER Work Plan.

Background

This background section gives a condensed history of some of the pivotal events and processes that lead to the development of the Cooperative Monitoring, Evaluation, and Research Program.

Resource Management Conflict

Turmoil in the area of resource management in Washington State during the mid- to late 1970's precipitated the Forest Practices Act (1974), the Boldt Decision on Indian Tribal Fishing rights (1974), and the "Classic U" court decision that brought Department of Natural Resources timber sales under State Environmental Policy Act review.

Resource managers sometimes felt as though they spent as much time in litigation as they did in the field. Some intelligent cooperation among interest groups was needed if state resources were ever to be managed at optimum levels.

New Cooperation

In response to this need for cooperation, the Northwest Renewable Resource Center held talks at Port Ludlow in the summer of 1986. These talks brought together representatives from the government, industry, Indian tribes, and environmental groups.

Following the talks, dozens of committees devoted over 60 meetings to hammering out a baseline cooperative agreement for approaching natural-resource management in the state. The final result was the 1987 Timber, Fish, and Wildlife Agreement.

The Timber, Fish, and Wildlife Agreement

Participants in The Timber, Fish, and Wildlife Agreement work toward a set of common resource-management goals in the following areas:

- Wildlife
- Fisheries
- Water Quality and Quantity
- Archeological and Cultural
- Timber

TFW Agreement Tools

In order to accomplish their goals, TFW Agreement participants have a number of tools at their disposal. Three of the most valuable tools are:

1. Interdisciplinary Teams
2. Alternative Planning
3. Cooperative Monitoring, Evaluation, and Research

Interdisciplinary Teams — These teams are composed of specialists in disciplines such as fisheries and hydrology. These teams are assigned to evaluate specific field conditions and make recommendations to the Department of Natural Resources concerning particular proposed forest practices such as harvesting timber on unstable slopes.

Alternate Planning — Alternate planning lets landowners consider a range of alternatives as part of applying for site-specific variances to regulations. This gives the landowner flexibility as long as the alternatives provide equal protection of public resources.

Cooperative Monitoring, Evaluation, and Research — This tool takes the form of the Cooperative Monitoring, Evaluation, and Research (CMER) Program. The program is a disciplined way to gather technical information both to develop and evaluate resource-management practices and their effects, and to promote understanding of relevant ecosystem interactions.

The Cooperative Monitoring, Evaluation, and Research Program

The CMER Program revolves around resource management issues that TFW Agreement participants want to resolve. These issues drive both Sub-program development and project design. Once an issue has been identified and agreed to, a CMER Sub-program may be set up as a framework for a number of individual research or study projects aimed at resolving that issue.

The CMER Committee coordinates research and evaluation work, and assigns specific projects or parts of projects to its Technical Steering Committees. These CMER Technical Steering Committees have expertise in certain disciplines such as forestry, fisheries, hydrology, soils, or wildlife. (For a more detailed explanation of how the CMER Program is structured and how it approaches research projects, refer to the CMER Program Structure and CMER Program Approach sections of this Work Plan.)

Sub-Program Management

Sub-program management means that the CMER Committee must develop and guide each Sub-program to satisfy the objectives of the TFW Agreement participants who are trying to resolve an issue. It also means that TFW Agreement managers must take an active role in guiding the CMER program's direction. In addition, information and results connected with sub-programs must be communicated to the TFW Agreement participants efficiently and in a readily understandable way.

Sub-Program Development — The success of the Sub-programs are based on mutual commitment:

- The commitment of the CMER Committee or CMER Technical Steering Committees to deliver useful information to the TFW managers.
- The commitment of the TFW Agreement managers to incorporate the information into their resource management decisions and practices.

Sub-programs must also be developed with certain principles in mind. They must:

- Reflect solid understanding of the TFW issues.
- Be conceptually grounded in an understanding of the appropriate resource systems.
- Focus on useful, management-oriented resource information.

Sub-Program Plan Evaluation — The CMER Committee has developed a formal set of evaluation criteria and procedures for Sub-program plan evaluation. These are covered in detail later in this section of the Work Plan.

Sub-Program Approval — All sub-programs must be developed in cooperation with the participating TFW Agreement managers. Final approval of all CMER sub-programs must come from the TFW Agreement Administrative Committee, which oversees all CMER Committee activities.

Sub-Program Administration — The CMER Committee works with the Technical Steering Committees to make certain that Sub-programs meet CMER Program and TFW Agreement objectives. The CMER Committee also:

- Coordinates Sub-programs (and projects) to eliminate duplicate efforts.
- Develops guidelines and evaluation criteria for the projects.
- Supports the Technical Steering Committees in the area of sub-program development and implementation, contract administration, financial management, and information management.

Communicating Sub-Program Information — The CMER Committee works closely with the TFW Training, Information, and Education Committee in the areas of reporting, application recommendations, technology transfer, and education associated with the Sub-programs. However, communication is also emphasized between CMER and all TFW participants.

Project Management

Project Development — Projects are designed to accomplish specific research or monitoring tasks within the framework of a CMER Sub-program. Technical Steering Committees are charged with designing projects with clear objectives, technical validity, and accountability in mind.

Project Development normally occurs in two stages:

1. Scoping to ensure that the proposed project meets TFW participant needs and CMER Program objectives.
2. Development of a technically sound study design.

Project Approval — The CMER Committee has final approval over all proposed projects.

Project Administration — Technical Steering Committees decide who will conduct the project and set up project guidelines and deliverables. Administration includes regular interaction with the project teams, contract administration, and reporting to the CMER Committee.

Project Evaluation — The CMER Committee has worked with the Technical Steering Committees to develop evaluation criteria and evaluation procedures for Project reviews. These are covered in detail later in this section of the Work Plan.

Projects are normally reviewed at three phases:

1. At the study design phase
2. During the study process
3. At the wrap-up (includes report evaluation as well as project's effectiveness in meeting its objectives).

Communicating Project Information — The CMER Committee works closely with the both the Technical Steering Committees and the TFW Agreement Training, Information, and Education Committee in the areas of reporting, application recommendations, technology transfer, and education associated with the Projects.

The CMER Committee also maintains close communication ties with a broad group of TFW participants and other interested parties.

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Sub-Program Management

As mentioned in the Overview, managing the CMER Program Sub-programs means that the CMER Committee must develop and guide each Sub-program to satisfy the objectives of the TFW Agreement participants who are trying to resolve an issue.

This section sets forth procedures and guidelines that will help with that process.

There are five primary areas covered in this section on Sub-program Management. These areas are:

- Sub-Program Development
- Sub-Program Plan Evaluation
- Sub-Program Approval
- Sub-Program Administration
- Communicating Sub-Program Information

Sub-Program Development

Sub-program plans unify related research projects. Because TFW Agreement decision-makers may use research and monitoring information in a variety of policy and field contexts, it is important that they take an active role in developing CMER products within the context of the sub-programs. Sub-program development often takes place in two stages:

1. Scoping by both CMER Committee members and TFW participants as part of workshops to recommend products, projects, and approaches.

2. Planning the steps it will take to develop and administer those projects. This should include conceptualizing the physical/ biological system so that a technically sound approach can result.

As part of this development process, the TFW Agreement Administrative Committee will give initial guidance for laying out what CMER will produce as a product that TFW managers can use.

The Sub-program then becomes the pathway that CMER follows to successfully deliver that product. While there may be one or more projects connected with the Sub-Program, the key is consensus on the product.

The remainder of this Sub-program Development section deals with the two stages mentioned above:

- Scoping Through Focused Workshops
- Sub-program Planning

Scoping Through Focused Workshops

Focused workshops are a key way of involving TFW Agreement participants and others in CMER Sub-program planning. These workshops are often by far the most efficient way of gaining the insight of people from a wide number of different organizations and geographic locations. While these type of workshops are particularly useful to the CMER Sub-program development process, they are also used extensively in connection with a number of other TFW Agreement activities.

Four Primary Results — There are four primary results that come from a successful CMER Scoping workshop:

1. Agreement on the resource issue and the need for monitoring or research.
2. Sharing of concerns and ideas for dealing with the issue.
3. Discussions regarding the most useful method for approaching the problem.
4. A consensus as to what kind of product to produce and for whom.

A Beginning Point — Focused workshops should be used for scoping activity and are considered a starting point. Keeping a running account of the workshop on notes or chartboards is important, but the end result should be action lists and timetables for future activity, and not a report or a proposed solution.

Approach — Workshops are designed to allow informal and instantaneous idea development and idea sharing. Experience in activities such as brainstorming (where ideas are quickly generated without analysis or criticism) and facilitation are important to the workshop's success. It would be advisable to at least acquaint yourself with these processes before attempting your first workshop.

Define Your Issue — A key aspect of a successful workshop is clearly and narrowly defining the issue or problem you are addressing. You can start with a smaller aspect of a broader problem and use this aspect to sharpen your workshop skills. For example, if you look at a specific resource system in terms of developing management tools within the scope of the TFW Agreement for that system, this may provide an easy way to start narrowing the focus of your discussions.

Enlist Experience — Another important ingredient to the workshop's success is making certain that you have a broad enough mix of experienced people (scientists, modelers, policy analysts, resource managers, for example) to cover all the critical aspects of the issue. If handled right, seeing an issue from a range of perspectives often helps clarify and focus the effort to solve it.

Use Simulations — You can start working together by using a simulation of a narrowly-defined real problem (such as a slope stabilization study). Direct the workshop to find a solution, and get the benefit of each participant's experience. This will help ground them in effective methods for finding realistic and feasible solutions to the broader issue you need to tackle.

Follow Up — It is extremely important to follow up after the workshop is finished. Copies of the notes and "thank-you's" should be sent to each participant. The notes may trigger additional important contributions to the idea process, and the thank-you's will help develop working relationships for further investigation of the issue.

In addition, each participant should be kept advised of progress toward the solution — especially if they are not actively involved in the solution process beyond the workshop. This is a key factor in technology transfer and team building within the TFW Agreement community.

Sub-Program Planning

Following the Scoping Workshops, Sub-program plans must be developed to guide the CMER Committee and its Technical Steering Committees in identifying projects and determining project sequences that will ultimately deliver the agreed-upon product.

These Sub-program plans are often developed by the CMER Technical Steering Committees most closely associated with the major research areas (such as fisheries or wildlife). Sub-program plans are like runway lights at an airport — they help committees identify critical pathways and stay on track.

Unified Research — Sub-program plans are the unifying element that unites several related research projects in terms of their expected products and their timing relative to each other. Another very important aspect of Sub-program plans is their role in identifying key interim steps and decision points between projects.

Narrow Definition — The CMER Committee defines Sub-programs as narrowly as possible because unrelated research projects and their results are difficult to track in terms of progress or budgets. An example of this narrowed scope for Sub-programs is the TFW Agreement resource issue of water quality.

We address the water-quality issue by breaking the issue down into four Sub-programs:

1. Sedimentation
2. Temperature
3. Large Organic Debris
4. Forest Chemicals

Each Sub-program may involve a number of related research projects aimed at TFW Agreement management needs such as risk assessment methods or the testing of current water quality regulations.

CMER Sub-program Plan Format — The following format has been developed by the CMER Committee as the accepted format for Sub-program plans:

CMER Sub-program Plan

Sub-Program Name:

Issue

Identify the primary resource issue and the focus for the monitoring or research associated with the issue.

Rationale

Identify the specific management issue.

Specific Questions

List a series of questions that further clarify the TFW management issue. These questions should be written so they reflect the TFW management problem and should be well-enough defined so that the Sub-program's research can answer them specifically. A well-thought-out question list is a key ingredient of a good CMER Sub-program.

Products

Describe the research or monitoring product for addressing an issue. If more than one is identified, they should be related to each other. That is, the products should be similar in nature. We recommend having only one or two products per Sub-program. If you need more, or the products are dissimilar, we will want to consider setting up a second Sub-Program to accommodate them.

Products should relate specifically to their use in a TFW management system. Avoid such generalized products such as "better understanding of stream processes", and focus on specific management needs, such as a channel risk-assessment method.

Action Plans

Identify those action steps that must be taken in order to deliver the specified products. Include —

- Workshops
- Each project (with beginning and ending points).
- Milestones such as key decision points.

You don't have to include specific project management steps, but do include a sufficiently detailed project description so that each project can be tracked as a line item in the Sub-program plan.

Budget

Provide a biennium budget that shows both the funds requested from the CMER Committee and those funds contributed by the TFW cooperators involved in the Sub-program.

Timeline

Use a timeline to identify all the major Sub-program milestones.

Sub-Program History

If your Sub-program includes any of the 19 original projects that were developed in 1987, include the old project number.

Program Integration Considerations

Discuss any overlap you envision among the CMER Technical Steering Committees as part of the Sub-program activities. Also identify any interaction that might be required with groups that are not part of the CMER Committee structure.

(We should pick a good example to follow and insert)

Sub-Program Plan Evaluation

The CMER Committee has developed a formal evaluation process for reviewing Sub-program plans. The following criteria are used in their evaluations.

CMER Sub-Program Plans — Evaluation Criteria

1. Scoping
   - ❑ Was the scoping process complete enough to identify both the most efficient starting point and the program elements?
   - ❑ Were alternative research products explored and identified?
   - ❑ Does the plan identify where this research fits on the overall TFW Agreement flexible management continuum (state-wide regulations to site-specific management prescription)?
   - ❑ Were seemingly appropriate options ignored (including adapting other research or monitoring data or projects)?
2. Usefulness
   - ❑ Will the proposed products prove useful to TFW Agreement participants?
   - ❑ Have all the appropriate people had an opportunity to contribute ideas or to endorse the tools proposed as part of the plan?
   - ❑ Are the proposed tools technically and administratively feasible for use by TFW Agreement participants?
3. Sufficient Planning
   - ❑ Are the action-plan steps sufficient to ensure the Sub-program's success?
   - ❑ Are potentially critical steps missing?
   - ❑ Do all the steps make sense?
   - ❑ Is there a clear pathway from one step to the next?

4. Integration
   - ❑ If the Sub-program requires work by more than one Technical Steering Committee, does the plan provide for integration?
   - ❑ Does the research product show up in more than one Sub-Program, and do they match?
   - ❑ Does the timing of the integrated projects or results fit?
   - ❑ How will the links among the various committees and research results be maintained?
5. Feasibility
   - ❑ Is the Sub-program technically feasible?
   - ❑ Does the scope of the Sub-program fall within the CMER Committee's capacity?
6. Budget
   - ❑ Is the budget adequate to accomplish the plan's objectives?
7. Delivery
   - ❑ What is the timeline for the product's delivery?
   - ❑ Will any useful interim products be developed during the course of the Sub-program's implementation?

Sub-Program Approval

The CMER Committee has primary responsibility for approving Sub-program plans. Any major deviations from the approved plans are subject to CMER Committee review.

All Sub-program plans are automatically reviewed annually, and are reviewed in connection with major budgeting activity. In addition, Sub-programs may require revision as research results come in or resource priorities change. These revisions will be reviewed as well.

Sub-Program Administration

There are eight major categories that form the guidelines and procedures for CMER Sub-program administration. These include:

- Contract Relationships and Competitive Bid Procedures .....
- Budgeting .....
- Program Tracking .....
- Steering Committee Management .....
- Interactions with TFW Agreement Participants .....
- Technical and Support Services .....
- Oversight Steering Committee .....
- Data Management and Documentation .....

Contract Relationships and Competitive Bid Procedures

Contractual arrangements between the CMER Committee (or the CMER Technical Steering Committees), and providers of monitoring and research services are a key element of CMER Program and Sub-program administration.

Primary Contract Administrator — The primary contract administrator of TFW Agreement funds is the Department of Natural Resources Contract Coordinator. This Coordinator serves as a CMER Committee member. The Contract Coordinator has responsibility for negotiating and administering contracts between all contracting agencies — including administration of Memorandums of Understanding between TFW Agreement participants or other cooperating agencies.

The Contract Coordinator follows Standard State of Washington Contracting Procedures and Guidelines in allocating TFW-Agreement or CMER-Program funds. The Coordinator works closely with the Technical Steering Committees to develop contract specifications for each project within a Sub-program.

Funds that come from sources other than the TFW Agreement participants or the State of Washington will be administered under the same guidelines as those that come from TFW Agreement or State sources.

Contract Relationships — Contract relationships for CMER Subprograms may take a wide range of forms, including:

- Awarding competitive bids.
- Awarding sole-source bids.
- Drawing up Memorandums of Understanding between TFW Agreement cooperators.
- Processing unsolicited proposals received by the Technical Steering Committees.

Competitive Bids — In this process, the CMER Steering Committee develops a Request for Proposal (RFP) for a specific project. Once the RFP is approved by CMER, it is advertised by the Department of Natural Resources. This is

an open invitation to contractors to design an approach and a budget for a project. It is one of the greatest opportunities to get new ideas and approaches regarding TFW Agreement issues.

Sole-Source Bids — Sole-source contracts normally take the form of intergovernmental agreements, and are reserved for instances when expertise in a given specialty is so limited that only one source can deliver within the scope and timetable of the project's needs. Since this method of contracting is — by definition — sensitive, sole-source contracts will not be allowed without substantial justification.

These sole-source intergovernmental agreements, when they are used, are normally awarded to researchers at universities or other governmental agencies.

Memorandums of Understanding — Memorandums of Understanding are used as contracts between CMER study cooperators. These are agreements to perform work or provide funding relating to specific projects or Sub-programs. Any project that is approved and conducted under CMER Committee auspices and that is funded entirely or partially by participants must be covered by a Memorandum of Understanding. These Memorandums state the nature of the organizations' commitment to the project.

Unsolicited Proposals — When a CMER Technical Steering Committee receives an unsolicited proposal to conduct research, CMER Chairs and Co-Chairs are given the opportunity to reject or accept the proposal for review. If they accept, the proposal is assigned to the appropriate Technical Steering Committee for evaluation.

If the Technical Steering Committee decides it wants to include the research as part of the CMER Work Plan, normal study plan approval procedures will be followed.

Competitive Bid Procedures — The competitive bid process starts when a Technical Steering Committee identifies a research need, sets up proposal evaluation criteria, and issues a Request for Proposal. A contract is awarded after the following procedure:

1. RFP advertised. The party who will fund the project advertises the RFP in the Seattle Daily Business Journal for one week. In addition, they send announcements to all the consultants and universities identified by the Technical Steering Committee. (The Department of Natural Resources Contract Coordinator maintains a list of qualified scientific consultants.)
2. Pre-proposal meetings. Pre-proposal meetings are held at least two weeks before the proposals are due. The purpose of these meetings is to give the Technical Steering Committee a chance to discuss the scope of work, contracting concerns, and the TFW Agreement guidelines with potential bidders.
3. Proposal Evaluation. The Technical Steering Committee evaluates the incoming proposals based on their pre-established criteria. Proposals are evaluated on their technical approach, cost considerations, and for the contractors' eligibility as minority owned- or woman-owned business or as a disadvantaged business. Contractors and subcontractors who have such status are encouraged to bid.
4. Short-listing. A "short list" of one or more bidders is interviewed before the final selection is made.
5. Select and Check. A contractor is selected for the project and at least three of the contractor's references are checked for past performance.
6. Study Plan Review. If the contract includes a technical study plan, the study plan must go through the standard technical review (described in the Project Management section that follows later in this Work Plan).
7. Final Negotiations. Once the references check out and the study plan passes review, the Technical Steering Committee negotiates the final scope of work. At the same time, the contracting officer for the funding agency or party negotiates the final contract language in conjunction with the Technical Steering Committee.

8. Contract Compliance. Administration of the contract is the funding agency's responsibility. Contracts can be of fixed-cost or cost-reimbursable nature with the appropriate interim reports or products. However, the Steering Committee coordinator(s) for each contract are responsible for recommending approval of the work (reports and products). Once approved, the funding agency pays the invoice in a timely fashion.

   Requests for Proposals (RFPs) — The Request for Proposal (RFP) is the formal process (and document) by which potential contractors are notified that a research contract is up for bid. The RFP is required whenever TFW cooperators or the CMER Committee uses a competitive bid process to award research contracts.

   Define Your Needs. The better the research needs are defined in the RFP, the better your chances of getting the research products you need. A poorly conceived RFP invariably results in poor-quality proposals and workplans.

   Two Parts. The RFP should specify that the proposal be submitted in two volumes:

   1. The Technical Approach (General Information and Scope of Work)
   2. The Cost Proposal (under separate cover).

   This two-part approach is required so that the technical approach can be evaluated on its own merits, without letting cost interfere with an impartial appraisal.

   Guidelines are Available. *RFP writers* should follow the guidelines that are spelled out in the pages immediately following. *Proposal evaluators* should use the technical review procedure found in the Project Management section of this Work Plan. *Contractors and consultants* who submit proposals should follow the Standard Study Plan guidelines provided in the Project Development section of this Work Plan.

RFP Preparation Guide

The following guide lists the key elements that make up an RFP. By using this guide, you will help ensure that proposal submitters have a clear understanding of what you expect. It also helps evaluators accurately rate incoming proposals if you use the guidelines for developing your RFP.

The RFP is broken into two sections:

- Technical Approach
  - — General Information (including the Problem Statement and a description of the Procurement Process).
  - — Scope of Work (including the desired results of the project).
- Cost Proposal (submitted under a separate cover).

REQUEST FOR PROPOSAL
name of project

I. GENERAL INFORMATION

A. Introduction

The Washington Department of Natural Resources (DNR) requests proposals to _____
The products of this contract shall be:

(1)

(2)

(3)

(You may want to make some statement about data format and documentation.)

This request for proposal contains:

(1) Background information that describes the problem and defines needs, including _____ supporting documents (Appendices _____( )
(2) The procurement procedure.
(3) A description of the scope of work.
(4) A guide for preparing a cost proposal.
(5) A sample of basic contract terms (Appendix C).

B. Background
how project relates to TFW agreement
other work done relating to this project

II. Procurement Process and Expectations

A. General Information

The Washington Dept. of Natural Resources (DNR) will administer the contract in consultation with the _____ Steering Committee of TFW.

B. Schedule

Schedule from this announcement to the beginning of the contract period:

1990
Mo. Day

_____ Announce RFP (advertised through).
_____ Deadline for receipt of Intent-to-Bid (noon, required).
_____ Pre-proposal meeting.
_____ Closing Date for receipt of proposals (noon).
_____ Announce short list.
_____ Interview top consultant(s).
_____ Select consultant.
_____ Negotiate scope of work.
_____ Begin work.

C. Selection Committee and Its Responsibilities

The selection committee will be composed of the members of the TFW _____ Steering Committee and DNR's TFW contracting officer. The committee's responsibilities include evaluating all proposals based upon the criteria established below, ranking the respondents, preparing a short list of potential contractors, interviewing the top consultant(s), and recommending to DNR the preferred consultant. DNR will negotiate the final contract terms and fees, in consultation with the selection committee.

D. Selection Criteria and Considerations

The criteria for selecting the consultant as a result of this solicitation are:

1. Consultant's demonstrated understanding of the goals and objectives of this solicitation.
2. Consultant's demonstrated ability to accomplish similar tasks.
3. Quality of the proposal.
4. Cost of the proposal.
5. Completeness of explanation of how information will be obtained.
6. Clarity of writing style as evidenced in conciseness and readability of the proposal.
7. Experience and background of key personnel to be assigned to the project.
8. Consultant's understanding of the purpose of TFW and the expectations of its participants.

E. Responding Vendors (intent-to-bid)

Vendors wishing to bid on this Request for Proposal (RFP) must do submit an Intent-to-Bid by NOON, Mo. Day (Day of Week). The response may be a telephone call or FAX followed by a written letter delivered on or before the pre-proposal meeting. DNR-FAX (206) 586-7311.

F. Pre-proposal Meeting

The attendance at the pre-proposal meeting is not required; however, proposals shall be based only on the material contained in this RFP and information presented or discussed at the pre-proposal meeting. The pre-proposal meeting will be held at the conference room of the Division of Forest Regulation and Assistance, Dept. of Natural Resources, 1007 S. Washington, Olympia, WA, at 10:00 a.m., _Day of Week_, _Month Day_.

G. Receipt of Proposals

Five copies of each proposal (with all supplemental material) must be received by the DNR, whether hand-delivered or mailed, no later than NOON on _Day of week_, _Mo. day_. A FAX will not suffice. No proposal received after that time will be accepted. The appearance of the U.S. Postmark indicating earlier mailing will not qualify a proposal which has not been received by the specified time.

The proposal must be addressed as follows:

Stephen Bernath, Contracting Officer
Dept. of Natural Resources
Forest Regulation and Assistance
1007 S. Washington, MS: EL-03
Olympia, WA 98504

Information phone: (206) 753-5315

The bid must be signed by person(s) authorized to legally bind the bidder and must contain a statement that the bid and total fixed price contained therein will remain firm for a period of sixty (60) days from the date and time of bid submission.

H. Incomplete Proposals

Proposals that do not address all areas requested by this RFP will be deemed unresponsive and will not be considered for possible contracts awarded as a result of this RFP.

I. Unnecessarily Elaborate Proposals

Unnecessarily elaborate brochures or other presentations beyond those sufficient to present a complete and effective response to this solicitation are not desired and my be construed as an indication of the Vendor's lack of cost consciousness.

J. Joint Venture/Teaming Arrangements

If a joint venture or teaming arrangement is proposed, the vendor shall clearly identify the lead organization and which cost elements pertain to each participant in the attachment(s). Any joint venture involving minority, women's, and disadvantaged businesses (MWDBE) must comply with the requirements of WAS 326-40-100, and be approved by DNR prior to the time fixed for bid opening.

K. Proprietary Information and Subsequent Contracts

Proposals submitted under this RFP will become public information after award of the contract. The information provided by the successful contractor of this project will be available to the public and will not be proprietary. The contractor under this RFP will not receive preference for any subsequent contracts.

L. Minority, Women's and Disadvantaged Businesses

All bidders shall use certified minority, women's and disadvantaged business enterprises (MWDBEs) to maximum extent possible in the performance of this contract. Contractors will be required to report to the DNR any participation of MWDBEs by line item and dollar value.

In order to be responsive, bids must include the nature and dollar value of the work to be performed by each firm. The MWDBEs named in the bid must be certified by the office of Minority, Women's and Disadvantaged Business Enterprises at the time of bid opening or proposal due date.

Bonus points will be awarded to those certified MWDBEs that have met all other requirements of the RFP and are the lead organization. By law, size of business or length of time in business shall not be considered. If the lead organization is not a MWDBE but identifies a MWDBE as a subcontractor, the proposal will receive a portion of the bonus points, dependent on the amount of work to be performed.

M. Criteria for Awarding Contract

The selection committee reserves the right to award contracts, not necessarily to the firms with the lowest proposal costs, but rather to those firms which will provide the best match to the requirements of this RFP.

N. Rejection of Proposals

DNR reserves the right to reject any or all proposals prior to execution of the contract, with no penalty to DNR.

O. Existing Documents and Data

Enclosed in this RFP package are _____ documents for review prior to preparing a response to this solicitation: Appendices __, __, __...

III. Scope of Work

A. Goal

The goal of this project is to _____

_____

B. Objective

C. Deliverables

D. Technical Approach

1. The technical approach shall be detailed by task such that the selection committee will understand exactly how the contractor proposed to complete the project. Each task will be cross-referenced in the time schedule.
2. etc.

E. Management Structure, Personnel, Resources, and Qualifications

1. Key personnel and how they will be used to accomplish each task. Include a chart cross-referenced to tasks and time schedule.
2. Resumes for each participant.
3. A list of comparable projects as a demonstration of skill and understanding of the problem in question. For each project include the name and address of the contracting officer representative and the fee received.

F. Assumptions, Deviations, and Exceptions

1. This is an opportunity for the consultant to explain aspects of the project the client may not have considered that will affect the proposal and/or final report.
2. This is also an opportunity for the consultant to submit an alternate proposal which deviates from the RFP requirements but still meets the client's needs.

G. Cost Proposal

1. General Information
   a. All costs are referenced to specific tasks in the Technical Proposal.
   b. List the expiration date for the cost quote.
2. Direct labor
3. Overhead, general and administrative expenses
4. Direct materials
5. Facilities and special equipment
6. Travel expenses
7. Sub-contract services
8. Profit/risk

H. Contract Terms and Negotiations

1. A standard contract form is provided. the proposal prepared by the selected consultant and any negotiated changes will become part of the contract.
2. The contractor shall provide to the DNR during and at the completion of the contract period reports and materials outlined in the scope of the contract.

Proposal Evaluation

Proposals are evaluated against a set of evaluation criteria, not against each other. The evaluation criteria include the overall quality of the proposal, the bidder's understanding of the research goals outlined in the RFP, and the bidder's experience. An example of a Proposal Evaluation Sheet follows.

The Committees may customize these evaluation sheets for a particular project. For example, the points that are assigned on this sample sheet for each category are arbitrary, and are changed at the Committees' option, depending on the weight they feel each segment deserves.

Proposal Evaluation Sheet

Project Title: _____

Bidder/Consultant: _____

Instructions: Score the proposal for this bidder following the proposal evaluation criteria listed below. Do not rank the proposal in relation to other proposals.

Evaluation Criteria:

		Points Scored
A.	Proposal Quality	
1.	Does the proposal provide a good explanation of what the bidder will accomplish? Does it make sense? (15 Points)	_____
2.	Is the proposal readable? Does it contain a good writing style? Is it concise? (10 Points)	_____
3.	Does the proposal contain original thinking or a unique approach? (5 Points)	_____
B.	Understanding the Research Objectives	
1.	Does the bidder understand the goals of the Sub-program? (10 Points)	_____
2.	Does the bidder understand the objectives of this project? (10 Points)	_____
C.	Bidder's Experience	
1.	What are the company's abilities? What are the abilities of the company's personnel and subcontractors? (15 Points)	_____
2.	Has the bidder performed similar research or tasks in this subject area? Has the bidder worked with similar research sponsors? (10 Points)	_____
3.	Has the bidder provided quality deliverables in a timely fashion on contracts of a similar nature? (5 Points)	_____

D. Cost

1. Do the costs appear reasonable?
(20 Points) _____

E. Sub-total
(points based on evaluation criteria) = _____

F. Bonus Points
(points awarded for Minority, Woman-owned,
or Disadvantaged Business status) = _____

G. Total points awarded this proposal _____

Budgeting

Both Sub-program and project budgets are normally developed by the CMER Technical Steering Committees who follow CMER Program guidelines.

Help is Available — The CMER Committee makes budget formats available to the Technical Steering Committees to help them with their budget process. In addition, the CMER Committee has a standing ad hoc budget committee that can help the Technical Steering Committees develop good budget proposals.

A Four-Step Process — CMER Sub-program budgets are developed and tracked in four distinct steps:

- Sub-program Budget Projections
- Annual CMER Program Budgeting
- Project Budgeting
- Budget Tracking

1. Sub-program Budget Projections. Based on Sub- program plans, the Technical Steering Committees provides annual or biennial estimates for Sub-program allocations. These early projections are put together each biennium at the same time the Sub-program plans are updated.
2. Biennial CMER Program Budgeting. The CMER Program's biennial budget is prepared during the February or March prior to the next legislative session for the biennium starting 15 months later. The CMER Committee takes the early projection budgets for the Sub-programs and uses them in conjunction with other committed funds to develop the program budget. The Committee balances budget requests against the funds allocated to the CMER Program from the state legislature and other funding sources.
3. Project Budgeting — The Technical Steering Committees budget for projects within the Sub-programs they oversee. These project budgets are reviewed by the CMER Committee before they are funded.

4. Budget Tracking — All Sub-program budgets are tracked by the contracting officer and reported to the TFW Administrative Committee. The CMER Committee also provides summary reports to the Technical Steering Committees to help them track their budgets.

Sub-Program Tracking

The CMER Committee tracks both the progress and the effectiveness of each Sub-program. They report the results to the TFW Agreement Administrative Committee and to other interested parties within the TFW Agreement group.

CMER Committee — The CMER Committee normally reports on only the major activities within each Sub-program, including critical decision points, the beginning and ending of projects, and the delivery of important interim or final reports.

Steering Committee Co-chairs — Technical Steering Committee co-chairs are asked to track the effectiveness of their committees in terms of accomplishing key action items.

Tracking Report Format — The CMER Committee uses the following general format for its reports to the TFW Agreement Administrative Committee:

Sub-Program Tracking Report

Sub-Program Name: _____

Quarter:

90.1 90.2 90.3 90.4 91.1 91.2

Action: _____

Quarter: Action: Date Accomplished:

***(Reviewers: This report format needs revision in order to be readily understandable by someone not familiar with the process.)*

Technical Steering Committee Management

Most of the day-to-day functions of the CMER Program are carried out by the CMER Technical Steering Committees. Effective committee relationships and good management are critical to the overall success of the CMER Program.

The CMER Technical Steering Committees co-chairs and committee members are all volunteers who do a difficult and important job on top of their already full schedules. It is important that they evaluate their effectiveness as a committee as part of solving problems in the early stages.

These evaluations help maintain maximum committee efficiency. Therefore, each Technical Steering Committee is advised to do an annual process check — an evaluation of their efforts and the results. Some of the questions that the Committees should ask include:

- Membership — Are all our core positions filled? Do we need to recruit new expertise?
- Attendance — Do we have good attendance by core members. Who is attending regularly. Is any lack of attendance posing problems when we try to reach the objectives of our meetings?
- Leadership — Are the committee co-chairs providing effective leadership by using the TFW Agreement ground rules for conducting out meetings? Do they send out the material we need in a timely fashion? Do they help our group develop an effective working atmosphere?
- Participation — Is everyone on our committee making a contribution? If not, what is the problem? Do our members follow through on their assignments?
- Effectiveness — Is our committee delivering the products we promise? Does our committee have an effective interaction with other TFW Agreement participants? Has anyone implemented any of our results or suggestions as part of a TFW management strategy?

The Evaluation Process — The evaluation process normally follows these four steps:

1. Technical Steering Committee co-chairs send out a questionnaire to each committee member. (A sample questionnaire follows this section.)
2. The Committee members fill out the questionnaire and send it back to the co-chair. The co-chair compiles the information and brings it to the next meeting.
3. The Committee meets to discuss the results of the evaluation. The co-chairs write a summary report of both the evaluation and the evaluation discussion and send it to the CMER Chairs and Co- hairs Committee.

   The co-chairs of each committee have the task of resolving specific problems that are identified as part of the evaluation, but the CMER Chairs and Co-chairs Committee is available to help with advice and follow-up actions.
4. If at any time the Technical Steering Committee members feel they need an outside facilitator to help resolve an issue, they can request help from any of the CMER Co-chairs.

Sample Evaluation Questionnaire — The following questionnaire can be used as a template for your committee's evaluation questionnaire.

Technical Steering Committee Self-Evaluation Form

1. How would you rate our committee's productivity last year? Was it:

   Astounding? Respectable? Passable?

2. Were our objectives and timelines both clear and realistic?

3. Did we meet our objectives and timelines within reasonable tolerances?

4. How would you improve our committee procedures?

5. Are all our core positions filled? (Two nominated from each of the following sources:
   - Industry
   - State government
   - State Indian Tribes
   - Environmental Organizations

6. Do we have the right mix of members to be effective?

7. What special skills or expertise do we still need? (Who would you recommend to fill the need?)

8. How is our attendance? (Do we have a consistent, reliable core who attend?)

9. Do we have attendance patterns that cause problems for the committee? (If so, describe them.)

10. Is the work equitably share by all on our committee?

11. Do our members share equally in the decision-making process?

12. Do our members usually follow through on the tasks they take on?

13. Does our committee operate using the TFW ground rules? (Respecting members from all contingencies, building consensus decisions, taking a problem solving approach to conflict?)

14. How would you rate the leadership of our committee?

15. Do our co-chairs facilitate active participation by all our members?

16. Do we take care of committee business efficiently?

17. How could our co-chairs improve their performance?

CMER Committee Interactions with Others

The CMER Committee interacts both with other TFW Agreement participants and with outside entities. These interactions take on a number of forms relating to a variety of issues. Some of this interaction occurs with:

- TFW Administration and Policy Committees
- Other TFW and CMER committees (e.g., ad hoc groups and the cultural/archeological committees.)
- Entities outside the TFW Agreement process

TFW Agreement Administration and Policy Committees — The CMER Committee passes information along to the TFW Agreement Administration Committee, to whom it reports. The Administration Committee passes information on up the reporting structure to the TFW Agreement Policy Committee. These two higher-level committees, in turn, serve the CMER Committee by:

- Managing TFW Agreement participants' interaction on Sub-program research products and objectives.
- Acting as a clearing house for information regarding other TFW Agreement activities that might benefit or otherwise affect the CMER Program.
- Communicating CMER Program information and results in the right format for the right forums.

Other TFW Agreement and CMER committees — The CMER Committee sometimes facilitates communication between:

- The CMER Technical Steering Committees and other TFW committees such as the Training, Information, and Education Committee and the Field Implementation Committee.
- The CMER Technical Steering Committees and other TFW participants.

Topics for these communications include Resource Management Plans, technical reviews for Sub-programs or projects, and workshops.

Entities outside the TFW Agreement process — The CMER Committee also interacts with groups outside the TFW Agreement process to gain access to research and to share information. Some of these outside entities typically include:

- Universities and other academic institutions.
- Other government agencies such as the Environmental Protection Agency, the U.S. Forest Service and the Bureau of Land Management.
- Sources of possible research funding.

Technical and Support Services

The CMER Committee has a number of technical- and support-service roles to fill in regard to both the CMER Program and its Sub-programs. These roles encompass the following areas:

- Publications
- Technical Advisory Board
- Technical Review Board
- TFW/CMER Archive
- Recognition
- Data Management and Documentation

Publications — The CMER Committee provides publications and special documents that report research results for both Sub-programs and projects. The CMER Committee is responsible for ensuring that TFW Agreement participants have ready access to CMER publications. The State Department of Natural Resources distributes TFW and CMER reports to the public.

Technical Advisory Board — The CMER Committee will provide its Technical Steering Committees with Technical Advisory Board members who have a broad range of skills required for successful Sub-program and project management. Board members may come from inside the TFW group or can be outside consultants. Their skills may include:

- Statistical design
- Computer systems analysis and design
- Education
- Presentations

Technical Review Board — The CMER Technical Steering Committees periodically request independent peer reviews for study plans and final reports. The CMER Committee has compiled a list of people who have the technical expertise to conduct such a review.

The CMER Committee tracks requests for assistance from these outside experts so that they are on a rotation basis. This way, no one person should receive more than two review requests each year. Technical Steering Committees contact Review Board members directly, but also notify the CMER Committee, so they can track requests.

The TFW/CMER Archive — The Washington Department of Natural Resources maintains the archive for important TFW Agreement documents, including CMER Committee papers. Items that are stored in the archive repositories include:

- Technical Review reports
- Program evaluation reviews
- Contract performance reviews
- CMER Program evaluations

Recognition — The CMER Committee develops and presents awards and acknowledgements to those who make a substantial contribution to the success of the CMER Program.

Data Management and Documentation — The nature of the TFW Agreement requires close cooperation among participants. Part of this cooperation hinges on the reliability of both the data and the information gathered as part of the CMER Program. Without good documentation, the scientific credibility of any study is open to challenge. Information from TFW research studies must be documented, stored, and shared if TFW participants are to benefit from it.

Dataset Directories and Data Dictionaries — As part of this data management and documentation process, a dataset directory and data dictionary are required as part of the annual study report for each project or Sub-program supported by TFW Agreement participants. The plan is to have a central repository where all this data and information can be housed. (The site has not yet been selected.) Both cooperators and contractors are required to submit hard copies for their data directories and data dictionaries, as well as computer-readable data files.

Centralized Information — The TFW Information Management Committee will serve as a technical resource to the CMER Committee in putting the CMER Committee's portion of this overall data management program in place. With their help, the CMER Committee will maintain a centralized dataset directory and data dictionary that can be accessed via telecommunications. This will help the development of a common knowledge base among TFW Agreement participants and encourage the flow of information.

Data Management and Documentation Guidelines

The following guidelines were developed by the Information Management Steering Committee,— a former technical subcommittee of the CMER Committee.

Easy Information Transfer — These standards are designed to make it easy to transfer data and information among cooperators. At the same time, they will allow maximum flexibility in the way cooperators handle their data internally. Guidelines are provided for data documentation, including formats for a dataset directory and a data dictionary. Guidelines are also provided for data communication and exchange. These guidelines specify electronic media, formats, etc.

Designed by Consensus — Although these guidelines are subject to change from time to time as technology changes, they represent a strong consensus about how the TFW data should be shared and documented.

Documentation is Key — The CMER Program both generates new data and relies on existing data. The databases that house CMER Program data must be sufficiently well documented so that new projects can easily take into account previous studies and the environmental variables measured by those studies. Documentation is also important due to the diversity of the subject matter for CMER Program research and the varied ways in which TFW Agreement participants will want to use that data.

Documentation Tools — There are four important tools for making certain CMER research data are documented and readily accessible:

- Dataset Directories
- Data Dictionaries
- Standards for Data Communication and Exchange
- File Backup and Exchange Standards

The Dataset Directory — The dataset dictionary lists the data sets (data bases, data files) that are used to organize similar groups of information in data processing. The information that must be contained in each dataset directory includes the following six items:

1. A general description of the dataset, (including key search words — underlined).
2. The beginning and ending dates for the dataset collection.
3. The software or other type of method used to capture the data.
4. The size of the dataset.
5. The place where the dataset is maintained.
6. The name of the contact person and a phone number.

Dataset Directory Form

The following information must be contained in each dataset directory. Use this form as a template:

1. General description of your dataset, (including key search words — underlined).

2. The beginning and ending dates for your dataset collection.

3. The software or other type of method used to capture the data.

4. The size of the dataset.

5. The place where the dataset is maintained.

6. The name of the contact person and a phone number.

The Data Dictionary — The data dictionary contains 11 common data elements that are included as part of each CMER Committee-sponsored research project. Those 11 elements include:

1. A project identifier
2. The data element name
3. A single-line description of the data element
4. A detailed description of the data element
5. The units of data measurement
6. The field format and the field length
7. An example of the data
8. The code descriptions (if used)
9. The valid range of the data values (if applicable)
10. The source of the data
11. The person or organization responsible for data
12. The method by which the data were collected.

Data Dictionary Example

This is an example of a Data Dictionary that has been filled out with imaginary information. Use it as a guide for filling out your own Data Dictionaries.

1. Project identifier: TFW-88-3
2. Data element name: Water-type CD
3. Single-line description of the data element:
   DNR water-type code
4. Detailed description of the data element:

   Department of Natural Resources (DNR) water types are used to classify streams, lakes, and ponds in Washington State. These descriptions are created relative to forestry practices. The classification criteria are described in WAC 222-16-030.
5. Units of data measurement: N/A
6. Field format and the field length: Numeric, 1
7. Example of the data: 1
8. Code descriptions (if used):
   1. State and/or statewide significant shorelines
   2. Waters of high use and importance in water quality
   3. Waters of medium use and importance in water quality
   4. Waters with influence on downstream water quality
   5. Waters not included in Types 1 through 4 above
   9. Unclassified waters
9. Valid range of the data values (if applicable): N/A
10. Source of the data: DNR water-type reference maps
11. Person or organization responsible for data:

    Department of Natural Resources — Forest Regulation and Assistance Division

You can use the following Data Dictionary Form as a template.

Data Dictionary Form

1. Project identifier: _____
2. Data element name: _____
3. Single-line description of the data element:

   _____
4. Detailed description of the data element:

5. Units of data measurement: _____
6. Field format and the field length: _____
7. Example of the data: _____
8. Code descriptions (if used):

9. Valid range of the data values (if applicable): _____
10. Source of the data: _____
11. Person or organization responsible for data:

Standards for Data Communication and Exchange — We are currently using the following standards for electronic data exchange. These are subject to change as technology changes. You should include a data dictionary as part of each exchange.

Mainframe or minicomputer to mainframe or minicomputer via magnetic tape — Use the following guidelines for this type of exchange:

1. Use nine-track tape, 1600 or 6250 cpi (characters per inch)
2. Use fixed-length records and blocks ("stranger" format).
3. Use either ASCII or ABCDIC formats.
4. Use two "end of file" messages at the end of your information.

Personal Computer to Personal Computer (XT/AT to XT/AT)

1. The data recipient needs floppy disks formatted using the DOS "FORMAT" command.
2. The data provider must use PKARC/PKXRC shareware and utilities for compacting the data and archiving data files on floppies. (Shareware is available through the CMER Technical Steering Committee for Information Management. [IMC]).
3. The information must be compatible with PC-DOS or MS-DOS 2.0 versions or higher (more recent) versions.
4. All data files should be in ASCII format.

PC Application Software to PC Application Software

1. Use the ASCII format for data exchange.
2. The CMER Information Management Committee will provide software conversion tables for special tabular and digital data.

File Backup and Exchange Standards — These standards apply to all CMER dataset directories, data dictionaries, technical reports, and papers.

1. The data recipient will provide floppies that have been formatted using the DOS "FORMAT" command.
2. The data provider will use PKARC/PKXRC shareware to compact and archive information on the floppy disk.
3. The data must be in ASCII printer-ready files.
4. The data should be in a form that is compatible with PC-DOS or MS-DOS version 2.0 (or higher).

Communicating Sub-Program Information

The CMER Committee has a wide range of communication responsibilities to a varied audience. There is a core communication responsibility, however, that must be carefully fulfilled. There are four primary areas where the CMER Committee must communicate information both about the CMER Program and research results that come out of the program. These four areas include:

1. Giving other TFW Agreement entities information and a certain degree of training that is derived from Sub-program results.

   As part of this process, the CMER Committee will rely on its Technical Steering Committees for guidance concerning communication strategies and relevant audiences.

2. Recommending policy changes to the Administrative Committee based on research and monitoring information.

   The goal for the CMER Committee is to make these recommendations based on a consensus of those involved. If, however, consensus can't be reached and the recommendation must go forward, the CMER Committee will present opposing opinions, a range of options, and the rationale behind those options.

3. Letting other TFW Agreement entities know about new resource management tools that are developed as part of the CMER Program.

   Information concerning these tools will include situations where they can be appropriately applied and the limitations on their use. As part of this communication process, the CMER Committee will work closely with the TFW Field Implementation- and the Training, Information, and

Education Committees to develop the proper training for the tools' field use.

4. Providing guidance to other TFW Agreement committees on how to interpret the results of CMER Program research and monitoring.

   This communication work includes helping TFW participants develop the procedures to share information with the public — and to make sure that all information carries with it any caveats that are indicated by the evaluation.

Section 2. Project Management Table of Contents

Project Management

- Overview
- Project Development
  - Project Scoping
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Project Management

The Project Management portion of this CMER Work Plan Notebook is made up of the following six sections:

1. Overview of Project Procedures
2. Project Development
3. Project Approval
4. Project Administration
5. Project Evaluation
6. Communicating Project Information

Overview of Project Procedures

Projects are developed within the framework of a specific Sub-Program that is aimed at resolving a resource management issue. The Sub-Programs serve to unify related projects in terms of their expected products and their timing. They also identify key interim steps and decision points between individual projects.

There are a number of procedures associated with project development, approval, implementation, and evaluation. They include:

- Project Development — including Project Scoping, writing and issuing a Request for Proposal (if applicable), and submission of draft study plans for the project.
- Project Approval — including a technical review of the study plan and revisions of the plan as a result of the review. The revised plan is then approved by CMER.

- Project Administration — The approved study plan becomes the guiding document for the project. Administration also includes the development of an administration plan, and review of any interim technical reports that are required by the project study plan.
- Project Evaluation — The project is evaluated both at the draft study plan phase (as mentioned), and during its progress as the technical steering committee associated with the project reviews interim reports.
- Communicating Project Information — The technical steering committee responsible for the project must develop a communication plan for disseminating the results of the project, and submit that plan to the CMER Committee before it submits its final project report.

Project Development

Project development takes place in several stages, with the target of arriving at a CMER-approved study plan.

Project Scoping

During the early phases of project development, the Technical Steering Committees present an informal Project Scoping Report in front of the CMER Committee. The purpose of this report is to: 1) alert CMER that a project is under development, and 2) to receive guidance from CMER on general TFW considerations and recommendations.

This early review helps the Steering Committees develop projects that meet TFW needs. It also facilitates subsequent CMER project reviews.

Report Format — These Project Scoping Reports:

- Are given by the Steering Committee chair or designated representative.
- Are oral and informal.
- Take 10- to 20 minutes.
- Include a brief outline of the project.

The Steering Committees have the option of presenting more than one project simultaneously if this approach improves the understanding of the Sub-program that unifies the projects.

Report Focus — The Scoping Reports are not technical reviews. They explain the project in the context of the overall CMER program. The reports focus on:

- How the project addresses a TFW issue.
- What to expect in the way of TFW products or applications for adaptive management.
- What is entailed regarding the nature of the project, its expected costs, and other pertinent information such as the cooperators in the project.
- How the project fits with other projects.

Study Plans

Plans Required — All projects sponsored by or approved by the CMER Committee are required to have a study plan. This includes projects funded entirely or cooperatively by TFW funds, as well as projects conducted and funded entirely by cooperators or other agencies. Guidelines for developing study plans follow in the next few pages of this workplan.

Plan Developers — Study plans may be developed by Technical Steering Committees, cooperators, or by contractors.

When projects are going to be developed by contracts, a Request for Proposal (RFP) should be used. The procedure for RFP's is described in the Contract Policy section of the Sub-Program Management portion of this workplan.

Experimental Designs — Study plans for projects that require experimental design must include descriptions of the:

- Hypothesis
- Methods
- Budget
- Personnel

These projects must also go through the technical review process.

Projects that don't require experimental design (e.g., literature reviews) can be briefer and don't need to go through the external elements of the technical review process.

Guidelines for Study Plans and Reports

I. Front Matter

- A. Title Page (title, author(s), affiliation, date)
- B. Disclaimers, Proprietary Statement
- C. Table of Contents
- D. List of Tables
- E. List of Figures

II. Introduction

- A. Problem Statement and Study Purpose — Describe the need for the study (i.e., who wants the study, response to the RFP).
- B. Goals and Objectives
  1. Goal — The ideal result of using the output from this project.
  2. Objective — The quantifiable action in terms of outputs, products, or units of measure (volumes, area, money, time, etc.)
- C. Hypotheses
  1. Literature Review (what is or isn't known).
  2. Questions to be answered and the hypotheses to be tested.
  3. Study Scope (e.g., applicability — global or specific to a given situation).
- D. Other Background
  1. Describe the area or environmental factors
  2. Other applicable TFW projects.

III. Proposed Methods (one for each hypothesis)

- A. Environmental Variables you will measure
  1. Units of measure.
  2. Relationship to the question.

3. Documentation (why each variable is the right one to measure, and the source for that viewpoint).
4. How the variables coordinate with similar variables on other TFW projects.

B. Experiment Design

1. Sampling techniques.
2. Field methodology (field forms).

C. Data Analysis

1. Analysis (software)
   a. Statistics to be calculated
   b. Statistical tests you will use
   c. Other analyses
2. Data Storage and Retrieval (See the Sub- program Management section of this workplan concerning data sharing and documentation).

D. Technical Approach: Study Implementation

1. Describe the methods you will use to solve the problem or achieve the objectives. This is where, upon the receipt of the proposals, the client learns how well the consultant understands the problem. All the work is listed by tasks.
2. Arrange the tasks in a logical progression of the outputs. Associate each task with a specific schedule and one or more deliverables. Include project flow charts such as PERT charts or CPA where they are relevant.

IV. Deliverables

A. Describe the product format for the contract. If written reports are required, specify the number of copies, whether camera ready copies are required, or whether there will be copies on magnetic media. Include the format for any illustrations.

Specify who has responsibility for publishing the report. (see the Sub-program Management section on Technical Services).

Deliverables might include:

1. The schedule and description of Periodic (progress) Reports and Conferences (including review by the Technical Steering Committee and the contract officer).
2. The Final Report (including a draft and the final conference).
3. Working Papers (e.g., data, maps, software, notes, field sheets, etc.)
4. Printing Requirements and Distribution (data transmittal).
5. Right of Release (repository for information and data).

V. Management Structure, Personnel, Resources, and Qualifications

A. Key personnel — Describe the key personnel (e.g., project leader, principal investigator) and tell how they will be used to accomplish the tasks. Include a chart that cross-references tasks, deliverables, and schedule.

B. Resumes — Include resumes for each person, emphasizing their special qualifications for assigned tasks. Specify the role of each individual and the estimated time they will devote to the tasks.

C. Other resources required — List other resource needs such as:

- Equipment
- Training
- Cooperators (list specific tasks for each)
- Sub-contractors (tell why, who, what, and specific expertise).
- Other

D. Comparable projects — Include a list of comparable projects as a demonstration of both skill and an understanding of the problem in question. For each project, include the name and address of the contracting officer who represented the client and the fee that was received for the services.

VI. Assumptions, Deviations, and Exceptions

A. Explain any aspects of the project that the client may not have thought about that will affect the proposal or the final report.

B. If appropriate, submit an alternate proposal that deviates from the RFP requirements, but still meets the client's needs.

VII. Other Information

This section is available to the consultant for including any other pertinent information he feels is important for convincing the client that he is the best qualified consultant for the contract.

VII. Cost Proposal

A. General Information

1. Reference all costs and time requirements to specific tasks outlined in the Technical Proposal. This activity should reflect per- task personnel expenses.
2. Identify special needs.
3. List the expiration date for the cost quote.

B. Direct Labor

C. Overhead, General and Administrative Expenses

D. Direct Materials

E. Specific Testing

F. Facilities and Special Equipment

G. Travel Expenses

H. Estimated Cooperator Contributions (Cash, or In- Kind services)

I. Sub-contracted Services

J. Profit/Risk (only for contracted proposals)

Preliminary Project Approval

Once the CMER Committee has heard the Scoping Report and has given approval to proceed with project development, the draft study plan is written. This becomes the source for the next level of review.

Draft Study Plan Technical Review

The Technical Steering Committees' Role

The Technical Steering Committees have the primary responsibility for conducting technical reviews of the draft study plans. Technical Reviews are one of the most important aspects of the project-management process when it comes to ensuring scientific excellence.

Objective criteria must be applied to each proposal, workplan, or technical report. The use of such criteria will help to optimize cost effectiveness for TFW research and monitoring programs by: 1) minimizing duplicated effort, and 2) focusing projects within the TFW process.

The CMER Committee's Role

The CMER Committee will not directly review study plans or reports. After a Technical Steering Committee conducts its review, it drafts a review report and passes it to the CMER Committee. CMER then carefully reviews the Steering Committee's Technical Review Report according to CMER Review Criteria described later in this section.

Once the CMER committee has evaluated the Technical Review Report and has a copy of the final study plan or technical report, it can approve funding for study plans or accept the final report.

TFW Technical Review Process

The TFW Technical Review Process involves three elements:

1) The Technical Steering Committee evaluates the study plan for technical merit. This evaluation follows general CMER criteria pertaining to both TFW criteria and technical criteria (criteria follow in this section).

2) There is a TFW Technical Review session. TFW participants and invited guests review draft plans or reports.

3) There is independent peer review. Study plans or reports should be reviewed by two or more independent referees selected from the CMER Technical Advisory Board.

1. Technical Steering Committee Evaluation

The CMER Committee suggests that the Technical Steering Committee assign key members to formally evaluate the study plans, using: 1) TFW evaluation criteria, and 2) technical evaluation criteria. These criteria follow in the form of a checklist.

Technical Steering Committee — TFW Evaluation Criteria

To help relate studies to TFW, ask the following questions for each proposed study plan:

- ❑ How will it increase our understanding of the ecological or physical processes that might be affected by forest practices?
- ❑ How will it respond to a regulatory issue?
- ❑ How does the proposed project complement or duplicate elements of other projects?
- ❑ What role does this project play in supporting adaptive management?
- ❑ What role, if any, does this project play in understanding cumulative effects?

Steering Committee — Technical Evaluation Criteria:

To help ensure the technical and scientific excellence of the study plan under review, evaluate the following:

Hypotheses

- ❑ Are hypotheses clearly stated?
- ❑ Are hypotheses testable?

Statistical Tests

- ❑ Are the proposed statistical tests clearly identified?
- ❑ Will the proposed study gather enough data to apply the test?
- ❑ Are assumptions underlying the tests clearly stated?
- ❑ Does the design of the experiment clearly meet the underlying assumptions?
- ❑ Is each statistical test itself appropriate for the study being proposed?

Variables

- ❑ What variables will be measured? (including units and methods of measurement)
- ❑ Does the variable relate to forest practices, public resources, and/or the TFW Agreement, either directly or indirectly?
- ❑ Does it relate to other variables being measured?
- ❑ Is the variable being measured in other TFW studies as well?
- ❑ Does the variable represent a significant ecological component or process of concern within TFW, or does it have other TFW relevance?
- ❑ Is the variable one upon which forest practices are anticipated to have an effect, either directly, indirectly, or cumulatively?
- ❑ Will the variable be identified, observable, and available during the proposed monitoring and research studies?
- ❑ Is the variable quantifiable by methods presently available and consistent with experimental design guidelines and statistical analysis requirements?

2. TFW Technical Review Session

Comment Opportunity

After a draft study plan or report is available, TFW participants and other invited guests can meet to review the documents. This meeting and any written comments that result are the primary modes in which TFW participants can comment on the technical content of a project proposal/report.

Meeting Announcements

The TFW Technical Review Session should be announced at least one month in advance and widely advertised to TFW participants and other interested parties. The CMER Committee is available to help facilitate communication.

The meeting should be advertised in the TFW newsletter with a description of the meeting's purpose, its location, and time. The advertisement should also note who to call for more information and explain that draft proposals/reports will be provided upon request.

The sponsoring committee should make an effort to contact appropriate people, including interested CMER member, who may not regularly attend committee meetings. At least one member of the CMER Committee who is not on the sponsoring committee should attend this meeting.

Meeting Format

The TFW technical review meeting should start with a detailed presentation of the proposal/report content made by the author. This presentation should be followed by a discussion period guided by the sponsoring committee.

A notetaker should list the attendees and be available to record and later summarize any concerns and suggestions. Any changes proposed for the final document should be summarized, understood, and agreed to by all.

3. Independent Peer Review

Proposals/reports should be reviewed by two or more independent referees selected from the CMER Technical Advisory Board. Referees should be given one month to respond, unless other arrangements can be made.

Referees are encouraged to provide specific comments on the manuscript, and will also be asked to respond to a general questionnaire regarding revisions and the study plan/report's suitability.

Technical Review Report

As mentioned earlier, the Technical Steering Committee has the responsibility for presenting the CMER Committee with a detailed Technical Review Report for each study plan or report. This report:

- Summarizes the results of the technical review process.
- Lists the major comments that were received as part of the review process.
- Details how the comments were addressed in the final version of the proposal/report.

Report Format

Introduction — Begin the report with a very general summary of: 1) what problem the study plan/report addresses, and 2) how it addresses the problem.

Review summaries — The Technical Review Report should contain summaries of: 1) the Steering Committee reviews, 2) the TFW Technical Review Session, and 3) the Independent Peer Review.

Steering Committee Review — Steering committee members should respond to the proposal/report using the checklist provided earlier in this section.

TFW Technical Sessions — The TFW Technical Review Sessions should be recounted as follows:

- When and where was the meeting held and who was there?
- What were the general project plans (study plans) or conclusions (final reports)?
- What were important points of discussion, comments and criticisms?
- Summarize points of consensus and recommendations for changes to be included in final document.
- Are there general discussion and comments on the project that are relevant to the overall program (not just the project)?

Independent Peer Review — The Independent Peer Reviews should be noted as follows:

- Who reviewed the document? (include their general analysis sheet)
- Summarize the critiques.
- Describe the response to criticisms and suggestions provided by the independent reviewers.

The CMER Committee's Evaluation of the Technical Review Reports.

As mentioned previously, the CMER Committee will review and evaluate the Steering Committee's adherence to the technical review process, but will not directly evaluate the proposal/report itself. CMER Committee members will evaluate each Technical Review Report following this evaluation checklist:

CMER Evaluation Criteria for Technical Review Reports

- ❑ Were all elements of the process performed?
- ❑ Is the general approach in the proposal/report clearly identified?
- ❑ Is there agreement among review sources?
- ❑ Are points of disagreement or concerns identified?
- ❑ Were recommendations from the TFW Technical Review and the independent peer review incorporated into the final document?
- ❑ For the technical review session,
  - Was advertising for the review session adequate (timing, widespread)?
  - Did a sufficient group (that included the appropriate expertise) attend to provide adequate review?

CMER Approval

Once the CMER Committee is satisfied that the Technical Review Process has resulted in a viable study plan or report that has incorporated the appropriate comments and feedback, the CMER Committee approves the study for implementation or approves acceptance of the report.

Project Administration

Technical Steering Committees are responsible for overseeing the projects. Duties during the life of a project may include interim reporting, contractual arrangements, data sharing and documentation, and final reports. The Steering Committee should appoint a Project Implementor, who is the primary person from the Steering Committee who maintains close contact with the contractor.

This Project Implementor helps troubleshoot the project, and acts as the Committee's primary contact for the contractor. However, the Department of Natural Resources Contract Coordinator has responsibility for payments on contracts.

Project Administration Planning

At the outset of a project, the Technical Steering Committee submits a plan that provides a detailed account of how the project will be administered.

Administration Plan — The Administration Plan should include:

1) The name of the Implementation Coordinator for the committee.
2) Reporting agreements.
3) Evaluation procedures and criteria for the project.
4) Any need to integrate with other projects.
5) A Data sharing and documentation plan.
6) Any necessary contractual arrangements including M.O.U.'s, interagency interactions, etc.,
7) The important project milestones. (Important is defined as points where either the CMER Committee or the Technical Steering Committee needs to provide the other with something.)

Technical Reports

The CMER program is designed to answer questions about the effects of forest practices on public resources (water, fish, wildlife, and capital improvements). The IMSC has agreed that this type of information is best provided in the form of a series of technical, scientific reports that display, explain, and interpret data and results consistently.

Guidelines for Consistency — Such consistency will facilitate the integration of information among projects and will permit comparison of results across projects. The following section gives:

1) Guidelines for TFW technical reports
2) Stylistic format

These guidelines and format outlines will help assure good, consistent scientific writing.

Technical Report Guidelines

Numbering

Each report generated as part of the CMER process will be given a unique number as part of the TFW Technical Report Series. The number will be:

TFWppp-yy-nnn

where:

- "ppp" is the TFW CMER project identification number.
- "yy" contains the last two digits of the year published.
- "nnn" is the sequential number assigned for that year, i.e., 001, 002, 003, etc.

Numbers will be assigned when the final draft of a report is ready for the printer.

Standard References

Scientific disciplines differ in their methods for reporting findings. The references used in the TFW Technical Report Series are standard for biological/ecological sciences.

- The standard for word definition and spelling is *Merriam Webster's Third International Dictionary*, as updated by the latest edition of *Merriam Webster's New Collegiate Dictionary*.
- The overall format and style of a technical report are expected to conform to *The Chicago Manual of Style*, 13th edition.
- Biological conventions should conform to the *Council of Biology Editors Style Manual*, 5th edition (1983).

Much of the following material is adapted from this latter manual because it contains excellent instructions for writing different sections of a technical paper.

Manuscript Preparation

General Format:

- Type manuscripts on 8.5-by-11-inch white paper in letter-quality type with the following margins:
  - — 1.5 inches on the left
  - — 1 inch on the other three sides.

  Tight margins should be ragged with suspended hyphenation, if possible, when a printout is from a word processor.
- Number pages consecutively.
- Drafts should be double-spaced.
- Print final copies of reports on both sides of the page, single-spaced.

Figures and Tables

- Figures and tables occur in the text following the first place they are mentioned and are numbered in the order of their appearance.
- Place figure captions underneath the figure, number each figure, and label all relevant elements, axes, curves, etc.
- Place table captions at the top of each table. Include a number and brief descriptive title.

References and Citations

- References cited should include literature retrievable by readers wherever possible, but may also include unpublished reports and personal communications, if necessary.
- Citations in the text are designated by author, year, and sometimes page if direct quotes are used. For example, (Reisner 1986:34).
- All citations should appear in alphabetical order in the References Cited section, using the following style:

  For a book —

  Reisner, M. 1986. Cadillac Desert: The American West and Its Disappearing Water. Viking Penguin, Inc., New York.

  For proceedings, an article or chapter in a book —

  Ling, G.K.K. 1928. Bacteria in relation to plant diseases. Pages 590-606 in E.O. Jordan and I.S. Falk, eds. The Newer Knowledge of Bacteriology and Immunology. University of Chicago Press, Chicago.

  For a journal article —

  Bleed, A.S. 1987. Limitations of concepts used to determine instream flow requirements for habitat maintenance. Water Resources Bulletin 23:1173-1178.

  For theses, unpublished materials, and reports —

  Cite as a journal article or book, as follows: Author, date, title, and source.

Technical Report Format

The following format provides guidance for organizing TFW Technical Reports. Not all reports will fit precisely into this format, so authors should view the outline as an advisory checklist for organizing documents.

I. Front Matter

A. Title Page

(Title, authors and affiliations, date, report number)

B. Disclaimer — Each technical report shall carry the following disclaimer:

"The opinions, findings, conclusions, or recommendations expressed in this report/product are those of the authors and do not necessarily reflect the views of any participant in, or committee of, the Timber/Fish/Wildlife Agreement, or the Washington Forest Practices Board, or the Washington Department of Natural Resources, nor does mention of trade names or commercial products constitute endorsement of recommendation for use."

C. Table of Contents

D. List of Tables

E. List of Figures

II. Acknowledgements

This section should contain the following paragraph to introduce the acknowledgements:

"This document was prepared under the auspices of the Cooperative Monitoring, Evaluation, and Research Committee of the Timber/Fish/Wildlife (TFW) Agreement. The TFW Agreement was reached in 1987 by representatives of the timber industry, state agencies, Indian tribes, and environmental groups with interests in, and responsibilities for, timber, fish, wildlife, and water resources in the State of Washington. It is a unique effort to manage public resources on state and private forest lands of Washington by consensus of constituents and interest groups representing historically disparate interests."

The "Acknowledgements" section should explain who is responsible for what portion of the work, if multiple authors, and others who contribute substantially to the report but not enough to be an author. Acknowledge any persons (if you have their permission) who helped you with research or in writing the report. Give credit for any funding and supply full information (i.e., number of grant and name and location of institution or organization).

III. Overview, Summary

This section describes contents of all other sections of the report, generally in a single paragraph per section. *The summary focuses primarily on results and recommendations.* It is brief, generally no longer than 1000 words, or two- to three single-spaced pages.

IV. Introduction

Begin the report by clearly identifying the subject. State the hypothesis or define the problem your research was designed to solve.

Orient the research you are reporting to previous concepts and research, particularly within the TFW program. A concise review of literature that is relevant to the specific aims of your research is appropriate. Do not try to convince the reader of the importance of your research.

Use the following checklist:

A. Background—Describe who did the study, where it was done, and how it fits within the TFW-CMER program.

B. Purpose of the Study—Describe the purpose, goals, and objectives of the study, with supporting citations from the scientific literature.

C. Hypotheses—State any questions to be answered, problems to be solved, or hypotheses to be tested.

V. Methods

Subject, Materials, Methods — Describe subjects, materials, and methods used (including experimental design) in sufficient detail to enable other scientists to evaluate your work or duplicate your research procedure. The usual sequence for experimental studies is:

- Design of experiment
- Subjects (plant, animal, environmental variables)
- Materials
- Procedures
- Methods for observation and interpretation.

Field Methodology — Describe field methodology used, but avoid unnecessary detail. If you used well-known methods without modification, simply name the methods or cite the papers in which they are described. If you modified them, describe the modifications.

Hypotheses — For each hypothesis, list:

- Environmental variables measured
- Their units of measurement
- Your rationale for measuring them

Support your rationale with literature citations. Provide details of your experimental designs, statistical sampling techniques, and statistical analysis and tests.

VI. Results and Observations

Present Results — Present the results of your research in a sequence that logically supports, or provides evidence against, any hypotheses being tested. Include qualifications on the use of results, such as limitations and reliability factors.

Answer Questions — Answer any questions posed in the introduction. Include only data and illustrative material that are relevant to the hypotheses and questions.

Make Observations — Build the narrative around figures and tables, but don't re-state the numbers in detail in the text. Key statistics about group data should emphasize the evidence upon which conclusions are based. Conclusions drawn from numerical data should be supported by brief statements of the statistical criteria applied. Do not omit important negative results.

VII. Discussion and Conclusions

Use this section to interpret data presented in the Results and Observations section. Pay particular attention to the problem, question, or hypotheses posed in the introduction.

Explain Data — Explain how the data answer the questions or provide evidence either supporting or refuting the hypotheses. For example:

- Do the data provide answers to the questions that led to the design and execution of the study?
- Is your evidence adequate?
- Relate Findings — Show how your findings relate to previous observations or experiments.
- Include discussion of previous findings (both yours and those of other investigators), that do or do not agree with yours.
- Consider reasons that might account for differences in findings.
- Clearly state conclusions that can be drawn from your data, in light of these considerations.
- Briefly present any logical implications of your findings for practical application or future studies.

VIII. References Cited

Use this section to list literature and other reference citations.

- List them alphabetically by the last name of first author.
- When writing early drafts, insert the appropriate citations into the text for published literature and unpublished documents. Use parenthetical citations of author and date.
- Maintain a running list of all citations either on index cards or electronically (word processor, database, etc.).
- Make a habit of entering the complete citation on the list the first time you cite a reference. Few things are as frustrating as trying to find the complete citation of an article that you have misplaced.

IX. Footnotes

If you use footnotes:

- Place them at the end of the appropriate page, numbered consecutively, throughout the document.
- Place the corresponding number of the note in the text immediately following the statement you wish to footnote.

X. Appendices.

Use this section to support the main body of the technical report. Included might be:

- Tables
- Figures
- Raw data
- Background information

Communication of Project Information

Communication Plan

Each Technical Steering Committee is responsible for providing the CMER Committee with its recommendations for how to communicate the results for each project.

Consideration of communication issues should occur throughout the project planning cycle. However, a specific communication plan that has been developed in accordance with an outline provided by the CMER Committee must be submitted prior to the meeting at which the project's Final Report is presented.

CMER will review and accept, or modify the plan.

Plan Content — Some of the essential information that the Technical Steering Committee should provide in the Communication Plan includes:

- Descriptions of TFW applications identified by the committee.
- Limitations on the applicability of results.
- Publications that will be provided, or are suitable for the TFW audience.
- People who would receive training in the use of a product.
- Recommendations for appropriate training or other technology transfer strategies.
- Appropriate next steps (including alternate paths for the sponsoring Technical Steering Committee or others).
- Data that needs to be transferred, if appropriate.

Wildlife Steering Committee Workplan Draft

Sub-program

Issue

Wildlife Communities and Habitat Relationships in Managed Forest Landscapes.

Rationale

The TFW agreement states:

> *"The wildlife resource goal is to provide the greatest diversity of habitats (particularly riparian, wetlands, and old growth), and to assure the greatest diversity of species within those habitats for the survival and reproduction of enough individuals to maintain the native wildlife of Washington forest lands."*

Purpose

The primary purpose of this research is to determine whether the provisions of the TFW agreement (RMZ's, UMA's, landscape planning efforts, leave-tree requirements, snag recruitment, etc.) provide sufficient habitat to achieve the stated goal.

Two-Level Issue

This issue must be addressed at two levels of resolution: 1) stand and 2) landscape. RMZ's and UMA's were devised as a means of providing late seral stage wildlife habitat in managed forests.

The implicit assumption was that the greater structural complexity of these older stands would provide some of the habitat components used by species associated with mature or old-growth forests. Projects 2 and 6 in the original CMER workplan were designed to evaluate this assumption.

It was quickly recognized, however, that inferences made regarding wildlife use of RMZ's and UMA's would not be useful without knowledge of the habitat conditions and wildlife communities in the surrounding landscape.

Furthermore, it was noted that monitoring wildlife occurrence at the stand level may not be reliable for some species due to small population size, high expected variance, or the high cost of monitoring at statistically valid levels. Therefore, it was decided that wildlife research and monitoring efforts would also be necessary at the landscape scale. Project 17 in the original CMER workplan was established to meet this need.

Landscape-Scale Study

As the wildlife program progressed, it became evident that the question of wildlife use of RMZ's and UMA's could not be answered outside the framework of a landscape-scale study. As a result, projects 2, 6, and 17 from the original workplan were combined under one heading. Assessment of the habitat values of RMZ's and UMA's will be accomplished as one component of the landscape scale wildlife research project.

Specific Questions

Stand level questions:

1) What wildlife species benefit from UMA's and RMZ's?

2) What habitat components of RMZ's and UMA's benefit these species? How do these differ from those found in intensively managed uplands?

3) Do RMZ's and UMA's contribute to wildlife species diversity in the managed landscape? If so, how?

4) Are the regulations adequate?

Landscape level questions:

1) How do the following factors influence wildlife habitats and communities at the landscape level?
   - Patch size and shape
   - Spatial distribution of patches—includes:
     - — Degree of isolation
     - — Fragmentation/edge effects
     - — Corridors/connectivity
   - Age-class distribution

2) Can landscape be classified using a combination of these variables and a plant community or ecoregion classification system? What is the best system of classifying forested landscapes to allow extrapolation of research results to similar landscapes?

3) What other variables may be relevant? These may include things other than landscape mosaics — e.g., open roads.

4) What wildlife communities are associated with different plant communities/seral stages/silvicultural systems?

5) How does forest management affect species assemblages on the landscape scale?

6) For a given wildlife objective, what is the optimal design for a landscape?

7) How can cumulative effects be addressed? What variables are relevant? Are there some parameters we can measure to get some idea of impact thresholds?

8) Are the regulations adequate? To what extent do the current regulations provide for the habitat needs of wildlife?

Products

1) Evaluation of the effectiveness of RMZ's and UMA's in providing habitat for wildlife. This will include:

   - An assessment of which species make use of these areas and the important habitat components.
   - An assessment of how this habitat affects the suitability of managed landscapes in maintaining wildlife species diversity.

   We anticipate that this information would be used by the TFW Policy group to evaluate whether RMZ's and UMA's provide adequate habitat and species diversity to accomplish the wildlife goal in the TFW agreement.

2) Classification system for managed forest landscapes.

   Classification will occur at two levels:

   - The first level will incorporate information regarding land forms, soils, climate, and potential natural vegetation to create a landtyping system.
   - The second level will classify landscapes based upon the nature and spatial distribution of vegetation "patches."

3) Baseline measures of the wildlife communities associated with different landscape classes.

   This will allow:

   - Comparison of wildlife communities between different classes, which may in turn yield some measures of the cumulative effects of timber management on wildlife.
   - Interpretation of the results of the intensive studies conducted on UMA's and RMZ's.

   There may also be opportunities to create guidelines for landscape level integrated resource planning.

4) Evaluation of the effectiveness of the TFW agreement in meeting the goals for wildlife habitat and wildlife diversity.

   We anticipate that this information will be used by the TFW Policy group to evaluate whether current forest practices provide adequate habitat and species diversity to accomplish the wildlife goal in the TFW agreement.

Action Plan

1) Develop a landscape classification system.

   - Classify landscapes based upon natural vegetation and variables describing the distribution and juxtaposition of different aged forest stands (spatial diversity).
   - To the extent possible, use GIS generated spatial statistics and physical characteristics data.

2) Design experimental program to investigate the habitat relationships of wildlife communities in managed forest landscapes.

   This would incorporate an experimental design to evaluate the role of RMZ's and UMA's in contributing to wildlife diversity in the landscape. The overall experimental design would incorporate replicates of natural and human-induced variations in habitat conditions in managed stands and landscapes.

   The TFW process provides promising opportunities for creating stand and landscape configurations to achieve specific management and research objectives (i.e., manipulating forest conditions according to an experimental design and evaluating wildlife responses).

3) Conduct research to determine baseline relationships of wildlife communities and habitat in managed forest landscapes.

4) Conduct research to determine relationships of wildlife communities in RMZ's and UMA's, with emphasis on determining the functional relationships between wildlife and the habitat components present. This would be done within the context of the landscape-level studies.

5) Investigate opportunities for constructing and validating habitat use predictive models.

6) Investigate opportunities for developing risk assessment tools and for developing exert system models.

Budget

BEGIN	END	WORK	IN-KIND	REQUESTING 1990-91	REQUESTING 1992-93
1990	1995	landscapes	—0—	$141,500	?
1990	1995	RMZ/UMA	—0—	$337,700	?

Timeline

Integration Considerations

The landform classification can be integrated with the stream valley segment classification system developed by the Ambient Monitoring program. The system for classifying landscapes according to spatial diversity (i.e. spatial distribution, age distribution, etc. of patches), may be useful to other monitoring efforts which require some measure of forest conditions at the landscape or watershed level.

Sub-program

Issue

Wildlife Habitat Characteristics of RMZ's and UMA's.

Rationale

The TFW agreement established certain leave tree requirements for RMZ's. When these were agreed upon there were no riparian characterization data available to assist policy makers in determining whether the minimum requirements were realistic or achievable. Consequently, TFW participants agreed that field data would have to be collected to provide a description of vegetation conditions occurring in riparian zones.

TFW participants also identified a need to know whether RMZ's and UMA's would provide structural and vegetative characteristics thought to be important to wildlife. Because a sampling design to answer the latter question could also yield answers to the former, the Wildlife Steering Committee was assigned the task of providing the information needed to address both questions.

Specific Questions

1) What wildlife habitat components occur in RMZ's and UMA's?
2) What is the range variation in RMA and UMA habitats?
3) How do RMZ's and UMA's change over time?
4) What different habitat types occur in RMZ's and UMA's and how can they be lumped into categories?

Products

1) Summary of the physical and botanical characteristics of RMZ's and UMA's with respect to wildlife habitat.

   This information will be used by TFW participants to determine the habitat conditions in RMZ's and UMA's. This will allow policy makers to assess whether the current minimum leave-tree requirements in the riparian regulations are achievable, and to estimate the amount of timber being left in RMZ's and UMA's.

2) Assessment of changes in RMZ's and UMA's over time.

   Repeated sampling of RMZ's and UMA's in subsequent years will allow an assessment of how these areas change through time. This information will be useful to managers seeking to improve upon the design of RMZ's and UMA's.

3) Classification of RMZ's and UMA's.

   This will identify the differences and similarities among different RMZ's and UMA's, which will allow stratifying these areas into sample categories. This will assist in the development of study designs for future projects. Focus of these efforts will be on classification of plant associations.

Action Plan

1) Conduct habitat inventories on 100 field sites per year, FY 90 through FY 95, in accordance with the Field Procedures Handbook developed by the Wildlife Steering Committee.

2) Summarize data from each field season. Analyze results during winter months to assess variability and determine whether the sampling design requires modification.

3) Beginning in 1990 field season, spend 20% of field time resampling sites visited in previous years. Compare results with previous inventories to assess the degree of change over time.

4) In 1990, assess data summaries for evidence of similarities and differences among sampled stands. Begin the process of classifying similar stands into categories. Make recommendations to WSC regarding stratified sampling design for subsequent studies of wildlife use of RMZ's /UMA's.

5) Report results annually to CMER, and make data available to CMER steering committees, other TFW participants, and contractors working on other CMER projects.

Budget

BEGIN	END	WORK	IN-KIND	REQUESTING 1990-91	1992-93
1990	1995	RMZ/UMA	$40,000	$124,000	$124,000

Timeline

Integration Considerations

CMER steering committees and other TFW participants may use this information to estimate habitat parameters (e.g. LOD loading, mid-stream canopy cover) that might be expected in similar situations. It will also be used in subsequent studies of the wildlife values of RMZ's and UMA's.

Fisheries Steering Committee Workplan Draft

Sub-program

Deliberate Addition of LOD in a Stream

Issue

The Deliberate Addition of LOD in a Stream (Project 4)

Rationale

Specific Questions

1) What is the effect of LOD addition on fish habitat?
2) What is the effect of LOD addition on fish populations?
3) What is the effect of LOD addition on fish production?
4) What is the effect of LOD addition on stream morphology?
5) How effective is an "operational" method of LOD addition compared to traditional methods?

Products

1) Information on the change in stream morphology, fish populations, and fish production following LOD addition.
2) An evaluation of an "operational" method of LOD addition for enhancement, mitigation, and management.
3) Information on fish populations and fish production correlated with habitat change.

Action Plan

1) Complete literature review, and site selection during FY 88-89.
2) Begin study on three stream sections without alteration for two rearing cycles. Collect population information, and habitat information during 1989-1990 on unaltered sites.

   During the fall of 1990 the LOD addition will take place within two of the three sections. Conduct habitat, population and smolt trapping work for the following four years (1991-1994).

Budget

BEGIN	END	WORK	IN-KIND	REQUESTING FY 90-91	FY 92-93	TOTAL
88	90.3	Unaltered site data collection		16.5		
90.3	90.3	Site alteration		0		
90.4	94.4	Data collection		0		

Timeline

Integration Considerations

The information on stream morphology will be useful to other projects concerning stream morphology.

The information on fish populations, and fish production with habitat information will be useful for determining the effects of forest management on fish populations (project 19).

Sub-program

The Effects of Forest Management on Fish Populations.

Issue

Effects of Forest Management on Fish Populations. (Projects 19, 15, 9, and 5)

Rationale

Some uncertainty exists concerning the effects of forest management activities on the fisheries resource. Additional knowledge is needed concerning how forest-management activities affect fish populations and contribute to habitat changes.

Specific Questions

1) What predictable and quantifiable effects do forest management activities have on fish populations? Are the effects of sediment and temperature predictable and quantifiable within a watershed and between watersheds? Can these impacts be predicted between watersheds based on a stream-typing system?
2) What are the sediment-related limiting factors in fish production in relation to:
   - Spawning
   - Egg survival
   - Rearing
   - Overwintering
3) How effective are the current Riparian Management regulations at protecting fish habitat?

4) What effects do multiple forest practices have on fish populations? (cumulative effects)

Products

1) Limiting Factors: We'll develop a procedure for identifying the limiting factors for selected fish populations on a site-specific basis.
2) Risk Assessment: We'll produce a Protocol for assessing the potential risks of a forest practice on fish production. This system will be designed for use in different watersheds. The change in population and community will be assessed.
3) Expert System: The overall objective is to produce an expert-system approach to refine and improve quantitative fish/forestry relationships throughout Washington.
4) Regulation Evaluation: The current Riparian Management regulations will be evaluated over time. We'll evaluate the effectiveness of these regulations to:
   - Provide LOD
   - Maintain temperature levels
   - Limit sedimentation
   - Maintain channel morphology

   We will recommend changes if they are needed.

Action Plan

1) Recruit Project Manager during late 1989 and early 1990.
2) Finalize the study plan and site selection during 1990.
3) Initiate field and laboratory studies during the fall of 1990.
4) Produce and test a prototype Expert System during late 1990 and 1991.

Budget

BEGIN	END	WORK	IN-KIND	REQUESTING FY 90-91	FY 92-93	TOTAL
89.4	90.1	Recruit Manager				
90.2	90.4	Finalize study plan, site selection				
90.3	91.2	Begin field work				
90.4	91.2	Complete prototype expert system				

Timeline

Integration Considerations

This study will use information from ambient monitoring, SHAM sediment studies, and temperature modeling.

Sub-program

The Effects of Sub-Lethal Elevated Temperatures.

Issue

The Effects of Sub-Lethal Elevated Temperatures on Salmonids. (Project 9, and 19)

Rationale

The removal or lessening of the forest canopy over a stream will have some effect on the maximum stream temperature. The lethal temperature limits for salmonids are fairly well established, but little information exists concerning the effects of sub-lethal elevated temperatures. In order to evaluate the effects of elevated temperatures, the sub-lethal effects need to be established.

Specific Questions

1) What are the effects of elevated temperatures on the spawning success of spring chinook salmon?
2) What are the effects of elevated temperatures on yearling migrants such as coho, spring chinook, and steelhead?
3) What are the effects of elevated temperatures on resident trout?
4) What are the effects of elevated temperatures on adult salmonids other than spring chinook — such as summer steelhead, summer chinook, and sockeye?

Products

1) Information on the effects of sub-lethal elevated temperatures on spring chinook's reproductive success.
2) Information on the ability of fish to regulate temperature exposure by their positioning and by modifying their migratory behavior.
3) Information on the effects of elevated temperatures on other salmonid species and other life-history stages.

Action Plan

1) Complete the pilot project for spring chinook during FY 88-89. Obtain information on fecundity, egg size, and egg survival on two temperature treatments. Use the knowledge gained at this stage during future work.
2) Complete the field project on spring chinook during FY 90-91. Obtain information on fecundity, egg size, and egg survival on two temperature treatments. Examine fish response to elevated temperatures within a natural environment.
3) Begin studying the effects of elevated temperatures on other salmonid species. Use both lab and field studies in order to fill information gaps.

Budget

BEGIN	END	WORK	IN-KIND	REQUESTING FY 90-91	FY 92-93	TOTAL
89	89	Complete pilot project				
89.3	90.3	Ccomplete field study		16.5		
90.2	?	Continue temperature research under above program				

Timeline

Integration Considerations

This information will assist in both the use and the interpreting of information from the temperature modeling.

The information will be incorporated into the evaluation of the effects of forest management on fish populations (project 19).

Sediment, Hydrology, and Mass Wasting Steering Committee Workplan Draft

Sub-program

Road Engineering and Slope Stability

Issue

Road Engineering and Slope Stability.

Rationale

Hillslopes that are steep and/or potentially unstable present severe challenges for the construction and maintenance of forest roads. Most of the landsliding and sedimentation problems resulting from forest practices are associated with roads; these will continue to be significant as forest practices are extended into more rugged terrain.

Specific Questions

1) How do we evaluate the design and construction problems posed by the difficult sites for forest roads?

2) Do current techniques provide for adequate function, stability, drainage, and so forth?

3) How might the system be improved so that erosion and hazards are reduced?

4) How effective are current road drainage methods and what improvements and tools do road engineers and planners need?

5) How do we evaluate existing roads so that problems can be found and treated in a timely manner?

6) Within the context of either continuing maintenance or abandonment, what analytical techniques should be used to determine whether certain dysfunctional culverts, cracked sidecast, or failing back-cuts, for example, can be fixed?

7) How can information on the best practices of evaluation, analysis, design, construction, maintenance, and abandonment of forest roads in unstable sites be communicated to the managers, engineers, operators, slope specialists, and regulators involved in the forest transportation system?

Products

1) Post-Construction Road Management Guidelines:
   - Guidelines for recommended methods of hazard and risk assessment
   - Techniques for dealing with apparent problem sites, to be used in evaluating and performing work for road maintenance and abandonment.

2) Pre-Construction Design and Construction Guidelines:
   - Guidelines for forest roads on steep or landslide-susceptible slopes, including such items as:
     — Site limitations.
     — Standards and specifications for excavations, compaction, reinforcement, and drainage.

3) Revised Edition of Roads Handbook: As appropriate, a revised edition of the roads handbook; proposed changes to the forest practices regulations; or any other means of communicating information that will facilitate adaptation of improved techniques.

Action Plan

1) Conduct a survey of road-construction engineers, regulators, etc. to determine their general confidence level in existing regulations and to identify any gaps and improvements in available tools. Surveys will be conducted in two parts:
   - A hydrology survey addressing methods for culvert sizing, cross-drainage spacing, debris passage, temporary crossings, and so forth will be conducted in 90.1 and a report issued in 90.2.
   - Other aspects of road engineering and construction will be surveyed in a separate effort during 90.2.
2) Conduct a field study on the condition and the performance of roads built, maintained, and abandoned within a given area, grouped according to age and the standards that were employed. Include observations on the relationship between techniques and erosional effects. (1992-1993)
3) Determine a decision point on future needs based on the survey results. (1993) Suggest revisions to guidelines as warranted.
4) Develop new techniques that forest-road engineers can use for siting, design, and construction as indicated by the field project. (1994)
5) Evaluation field study of recommended methods. (1994+)

Steering Committee

Sediment, Hydrology and Mass Wasting

Budget

BEGIN	END	WORK	IN-KIND	REQUESTING FY 90-91	REQUESTING FY 92-93	TOTAL FY 90-91	TOTAL FY 92-93
90.1	90.2	Questionnaire	0	6	0	6	0
91	93	RoadGuidelines Field Evaluation	?	45	45	45	45
	93	Decision on Additional Information Needs					
93		Further Steps as needed					
		1. Develop new techniques					
		2. Field Evaluation of techniques					

Timeline

Integration Considerations

This program will be receiving information from other slope stability efforts. However, the results will feed directly into hazard assessment work for any sensitive areas in which forest roads are to be built or maintained — specifically to the Orphan Roads program, which requires more rational methods of evaluation.

In addition, the results (specifically, finding out whether current or improved road-engineering techniques can reduce sediment delivery to streams) will be of importance to the channels group (SHAM) and the Fisheries Steering Committee, in their appraisal of prospects for amelioration of stream-habitat problems.

Sub-program

Slope Stability Hazard Assessment

Issue

Slope Stability Hazard Assessment.

Rationale

Any system of assessing and dealing with potential landslide problems depends on identifying susceptible areas early in the planning, operational, and regulatory schedule. This must be done so that the necessary technical evaluations and mitigation can be made in a timely manner.

Currently, the broad-scale screening tool used for this purpose within DNR and TFW is the slope-hazard ratings of the state soil survey. Because of the perceived deficiencies in this system, better means are being sought for providing classification of forest lands in terms of their potential for slope instability that either results from or is affected by forest practices.

Specific Questions

1) Is the current system of flagging providing adequate identification of potentially stable areas? In other words, does it direct further attention to a large proportion of the appropriate sites, while not creating excess work by flagging too many inappropriate sites?
2) Is a sufficient amount of information conveyed about the nature of the flagged sites so that we can determine what conditions to expect, what further assessment procedures should be carried out, and/or what mitigation measures should be employed?

3) Could a better system be developed in which the map units and their hazard ratings combine consideration of:

   - Relevant erosion processes.
   - The character of rocks, soils, climate, topography, etc.
   - The effects expected from forest practices that use a more rational means of analysis and classification and that have the flexibility to adapt to an evolving knowledge base and new technologies?

   Could such a system be implemented in a reasonable time and at a reasonable cost?

4) Could interim improvements be made to the soil survey that would make it more effective as a flagging tool?

5) What cost-effective, site-specific hazard assessment techniques could be used by TFW managers/engineers/ID teams that would be objective and accountable for developing prescriptions for road location and the design of new or existing roads?

Products

1) Improved Broad-Scale Hazard Zonation for flagging potentially unstable sites. One interim tool could be the better use of the soil survey for this purpose. A long-range tool could be a GIS-based system that integrates soils, geology, topographic and climatic interpretations.

   These flagging tools will be used by the DNR regulatory foresters and staff as well as by land managers.

2) Site-specific slope stability hazard-assessment methods (regionalized). Site-specific hazard assessment methods may be used by road engineers, regulatory foresters, managers, and ID teams.

Action Plan

1) Broad-Scale Screening Tool:

   A dual path will be followed that will:

   1) Develop improved technologies and methods (hazard zonation project).

   2) Attempt to provide interim revisions of the soil survey to alleviate shorter-term problems with this flagging tool (Soil Survey Revisions).

   The hazard zonation study will function in both capacities since methodology revisions will be evaluated within the context of the information gathered in the zonation project.

2) Soil Survey Revisions:

   a) SHAM will review proposed changes to soil survey (Schlicte's Method) and provide other modifications that may seem appropriate. (Complete 90.2)

   b) Work with FIC to develop a study plan to test revisions. (90.2)

   c) Perform external trial with TFW cooperators to test effectiveness of revision technique for improving flagging from manager's perspective. (90.2 to 92.4)

   d) Perform internal field trial on hazard zonation study area to test the technical validity of the method.

   e) Examine feasibility of using the U.S. Forest Service's LISA slope stability model (level 1) coupled with the soil survey to develop improved slope stability maps on a basin- by-basin basis.

   (Initial attempts at a similar effort by Olympic Forest soil scientists look promising.) Develop a method and implement a field trial, probably through the hazard zonation study. (initiate in 92)

3) Hazard Zonation Project:

   a) Conduct a survey of the state of the hazard-zonation system, including:

      — Procedures

      — Problems

      — Results

— Perceptions of operations and clients

— Alternative methods.

Report on the results of the survey, and develop a plan for development of revised methods for testing. (90.1)

b) Select pilot project study area. (90.1)

c) Perform field study:

— Collect information, including mass-movement features, data on properties of soils, rock, hydrology, etc.

— Perform slope stability analysis.

— Validate predictions with observed occurrences of failures.

— Revise methods as needed.

(Begin 90.1; report results: 91.4)

4) Site-Specific Screening Tools:

a) Hold slope-stability workshop for TFW participants to improve understanding of processes and familiarize individuals with state-of-the-art methods. (89.3)

b) Review methods (state-of-the-art and simpler methods) and decide on appropriate methods for various regions (eastside/westside, etc.) Do this through focused workgroup sessions. (90.2)

c) Implement external trials with TFW cooperators and evaluate effectiveness of methods selected by group. Evaluate both technical soundness of tool and its utility in TFW use by ID teams, road engineers, etc. (90.3)

d) Simultaneously test method(s) more intensively for technical validity in hazard zonation study. (91)

Steering Committee

Sediment, Hydrology and Mass Wasting

Budget

BEGIN	END	WORK	IN-KIND FY 90-91	IN-KIND FY 92-93	REQUESTING FY 90-91	REQUESTING FY 92-93
90.1	?	Soil Survey Revisions	No money requested at this time.			
89.1	91.2	Hazard Zonation	128.1	?	44.3	?
91.4		Decision point on future development of hazard zonation for statewide implementation.				
90.1	90.4	Site-Specific Assessment Method Field Trial	?	--	--	10.0	20.0

Timeline

Integration Considerations

This project will receive information from the hydrology group (SHAM), especially in regard to rain-on-snowmelt inputs and changes in infiltration due to forest practices. It will also use information generated in the hillslope hydrology and hollows projects being conducted by other agencies in Washington (U.W.—Cundy) and Oregon (U.C. Berkeley/WeyCo—Dietrich, Sullivan) performed outside the CMER framework.

The hazard-zonation project will aid in the general assessment of slope-stability problems, and will provide important information to projects dealing with the generation and delivery of sediment to first-order channels. Hazard assessment methods at both the broad and site-specific scale will be coupled with risk assessment methods generated by the SHAM-channel morphology group and AMSC for site-specific and cumulative effects analysis.

Sub-program

Forest Practices and Deep-Seated Mass Failures

Issue

The Role of Forest Practices in Contributing to Slope Instability of Deep-Seated Mass Movement Areas

Rationale

Specific Questions

1) What effects do different silvicultural and logging practices have on the stability of areas susceptible to deep-seated mass movement?
2) What effects do rain-on-snowmelt events have on the overall slope hydrology and stability?
3) How do the effects of tree removal on groundwater recharge and root shear strength — both before and after timber harvest — relate to overall slope stability?

Products

1) Workbook/manual for the field practitioner to use in interdisciplinary team work on timber harvest applications.
2) Database of collected data and literature pertinent to the slope stability of deep-seated mass movement features.

Action Plan

1) Conduct a literature search and review past results. Based on this analysis, determine what future research or monitoring is warranted. Focus the program and future field research by identifying which class of hillslopes or soils, mass movement types or climates, seem most susceptible to changes from forest practices. (complete 90.2)

2) Conduct field project monitoring of mass movement both before and after timber removal.
(Initiate 91.3; complete 94.2)

Steering Committee

Sediment, Hydrology and Mass Wasting

Budget

BEGIN	END	WORK	IN-KIND FY 90-91	IN-KIND FY 92-93	REQUESTING FY 90-91	REQUESTING FY 92-93
90.1	90.2	Literature Review and future program scoping	--	--	10.0	--
91.3	93.2	Field Monitoring Project	?	?	--	210.0

Timeline

Integration Considerations

Sub-program

Forest Management Effects on Hillslope and Channel Hydrology

Issue

Forest Management Effects on Hillslope and Channel Hydrology.

Rationale

Specific Questions

1) What effects do different forest-cover conditions have on snow accumulation and melt rate?
2) Is water delivery from rain-on-snow events different than water delivery from precipitation alone?
3) If water delivery to hillslopes changes, would it affect hillslope stability?
4) If water delivery to hillslopes changes, would it affect the timing and quality of runoff?
5) If peak flow changes, would it affect channel stability and morphology?
6) What are the cumulative hydrologic effects of forest management practices on a watershed scale?

Products

1) A predictive model for the effects of forest vegetation cover on snow accumulation and snow melt.
2) A predictive model for the effects that hillslope hydrology and management techniques have on slope stability.

3) A predictive model for the effects of forest management on streamflow and channel morphology.

4) A map of transient snow zones (with hydrologic probabilities related to stand age) for identifying hydrologic sensitivity on both site and basin scale.

Action Plan

1) Determine how forest cover affects the both the accumulation and melt of snow in the transient snow zone. Develop a database to use in future predictive modelling efforts. (complete 90.3)

2) Develop frequency-magnitude-forest cover curves that describe the effects of cover on water delivery to the soil. This forms a basis for a predictive model for rain-on-snow energy budget. Validate the model at long-term NOAA sites. (Begin 90.2; end 90.4)

3) Develop a magnitude-frequency-cover atlas for Washington that can be used as a basis for identifying hydrologic sensitivity. Information also to be used in the hazard zonation project and cumulative-effects analysis methods. (Begin 90.2; end 91.2)

4) Track research projects that develop sub-surface flow models for interpreting the effects of hydrology on slope stability (Cundy-U.W.; Dietrich-U.C. Berkeley). Incorporate results and predictive model into hydrology tools that will be useful to TFW.

5) Flow-routing model?

6) Cumulative Effects — Use a basin-scale hydrologic project to address the following issues concerning managed watersheds:

   - Cumulative hydrologic effects.
   - Timing and quantity of runoff.
   - Flow distribution.

     a. Conduct literature review of available methods and decide on best approach. (complete 90.3)

     b. Conduct a basic scale hydrologic project to develop a cumulative effects methodology. (initiate 91.3)

Budget

BEGIN	END	WORK	IN-KIND FY 90-91	IN-KIND FY 92-93	REQUESTING FY 90-91	REQUESTING FY 92-93
89	90.4	Rain-on-Snow (Harr)	66.0		11.0	--
90.3	90.4	Snowmelt Model	20.0		20.0	--
90.3	91.2	Rain-on-snow Atlas	--		90.0	--
90.2	90.4	C.E. Literature Review and Hydrologic Study Design			35.0	?

Timeline

Integration Considerations

Sub-program

Forest Management Effects on Hillslope and Channel Hydrology

Issue

Channel Stability and Hazards in Type 4 & 5 Waters

Rationale

Specific Questions

1) What is the relative importance of both in-channel and out-of-channel initiated debris flows and debris torrents (dam-break floods)?
2) Do forest management practices (stream crossings, debris management) influence debris flow occurrences ?
3) What factors determine the delivery of landslide material downstream? Will landslides result in debris flows or torrents?
4) What will be the effect of debris flows on channels? (Differentiate between the scour, deposition, and transition zones?)

Products

1) Hazard Assessment for Mass Failures Initiated In-channel. Identify potential hazards associated with forest management around type 4 & 5 waters relative to slope stability concerns. Establish relative importance regionally within the state and link to hydrologic issues.
2) Debris Torrent Prediction Risk Model. Assess the likely delivery of debris torrent material and any downstream effects.

Action Plan

1) Conduct a field inventory of in-channel failures to determine the relative importance of debris flows and debris torrents (dam-break floods). Analyze the distribution of affected channels with respect to potential controlling factors and regional importance. (90.2-91.1)

2) Develop a method to generate a stream-specific runout prediction (given a hillslope hazard) including sediment volumes, flood-wave characteristics, and quantification of erosive and impact forces. Calibrate and validate model. (91.3-83.2)

Steering Committee

Sediment, Hydrology and Mass Wasting

Budget

BEGIN	END	WORK	IN-KIND FY 90-91	IN-KIND FY 92-93	REQUESTING FY 90-91	REQUESTING FY 92-93
90.2	91.1	Field Survey of In-channel failures	--	--	35.0	--
91.1	91.3	Hazard Prediction Model	--	--	25.0	--

Timeline

Integration Considerations

Sub-program

Issue

Effect of Forest Management on Stream Channels (Sediment, Hydrology, Obstructions)

Rationale

Forest management practices that influence sedimentation hydrology or structure in stream channels can have significant effects on fish habitat as well as on the stream's physical and biological characteristics. Consideration of past and potential changes to stream systems may be an important consideration of the risk associated with planned forest practices.

The following questions are relevant to all channels including fish-bearing streams (types 1-3) and non-fish bearing streams (types 4 and 5). The potential impacts differ between the two, as do the prescribed forest practices. Therefore, any sub-programs describing strategies that address these questions and leading to improved management tools will be developed for type 4 & 5 streams and for type 1 - 3 streams.

Specific Questions

1) How does sediment etc. affect channel morphology?

   (What are the key response variable?)

2) How can we assess the status of a particular stream with reference to sediment, flow, and obstructions?

3) How do we determine where sediment etc. impacts will be displayed in channels?

4) What are the relationships between channel morphology and beneficial uses?

(How do we establish appropriate indicators of potential impacts?)

5) How can we assess risk of an activity to stream resources in terms of:
   a) How will channel be affected?
   b) How much?
   c) Where?
   d) How long?
   e) What effect on beneficial uses?
6) What strategies are appropriate for preventing and mitigating impacts to reduce their duration?

Products

Action Plan

Budget

Timeline

Integration Considerations

Sub-program

Issue

The Effect of Forest Practices on the Habitat in Fish-Bearing Streams

Rationale

Specific Questions

Products

Risk Assessment Methodology (Site Implementation) for determining the level of risk to public resource of actions which have the potential to impact fish-bearing streams. The risk assessment method could be used by field level managers and DNR field foresters to get rapid assessment of current stream conditions and potential risk from planned activities. RMP's or landowners could use a watershed-scale adaptation of this method for planning (CE Risk Model).

Action Plan

1) Initiate core research projects to develop response- variable model to produce cause and effect relationships between sediment, flow, LOD, and channel characteristics. (SHAM with AMSC) (90.2)

2) Develop field protocol methods and survey techniques (with AMSC). This can be used as rapid assessment technique. Begin internal trial on streams to demonstrate the technical validity of methods developed for RMV model (SHAM with AMSC).

3) Hold workshop with field people that will address:

   - Currently methods for assessing stream conditions
   - Thresholds that are used here and elsewhere.

   (Work with AMSC) (90.2)—Integrate with protocol developed above.

4) Perform external trial on both the feasibility and applicability of stream information in management decision-making.

5) Develop a database that captures baseline conditions for Washington streams (AMSC monitoring program).

Budget

Timeline

Integration Considerations

Sub-program

Issue

The Effects of Forest Practices on Type 4 & 5 Waters

Rationale

Specific Questions

1) Do the physical and biological conditions of type 4 & 5 waters have significant influence on downstream habitat? Conditions include:
   a) Sediment storage
   b) Debris
   c) Temperature (handled by TWG)
   d) Nutrients and organic matter (handled by water quality)
2) Are prescribed management practices providing adequate protection to downstream resources?
3) What is the extent and duration of various impacts such as:
   a) Peak flows and channel morphology?
   b) Debris torrents?
   c) Debris removal?
   d) Debris recruitment?
4) Are current stream typing methods adequate for appropriately describing small streams as a basis for applying BMP's?

Products

There are two types of products associated with this issue:

1) Hazard assessment methods
2) Management strategies

Hazard Assessment Methods

To be used by DNR regulatory foresters, field managers, landowners.

a) Priority Issue Screen.

b) Field Screening Method — This is a set of formal objective site evaluation criteria for stream sensitivity (hazard). This set is to be used for developing management options. A decision tree will provide guidance to field managers based on site-specific data.

c) Intensive Field Analysis Method — This is a more detailed analysis for high-risk sites.

d) Stream Typing — We will improve the current stream-typing method to be a more geomorphically-based method that has interpretations relative to beneficial uses.

Management Strategies

a) Debris Management Guidelines — These will validate the effectiveness of existing guidelines and modify them as needed.

Action Plan

1) Support a research study on sediment transport and storage in type 4 & 5 waters. The emphasis will be on:
   - Baseline conditions
   - Recovery mechanisms and rates after disturbance
   - Effects on downstream fish habitat.

Based on the results, we will develop a tool strategy.

2) Improve stream typing method for type 4 & 5 waters. (Work with AMSC and stream classification.)
   a) Basic descriptive work in channels.
   b) Measurement of characteristics in AMSC monitoring program ....
      - Establish some long-term monitoring sites.
      - Survey in a variety of locations in the state to establish baseline conditions.
3) Develop hazard-assessment tools through:
   a) Holding workshops
   b) Devising methods
   c) Conducting field evaluations
4) Test debris-management guidelines.

   (Focus on debris as a cause of debris torrents—in-channel, stream crossings)

Budget

Timeline

Integration Considerations

Sub-program

Forest Management Effects on Channel Morphology and Stream Processes

Issue

The Effect of Multiple Forest Practices on Fish Habitat (Cumulative Effects)

Rationale

Determine those watershed locations that are at risk from multiple forest practices within a basin. Preliminary Screening of watersheds at risk is currently based on broadly-based, probably subjective information. Some specific issues or problem areas have been identified. The results trigger a variety of responses appropriate to the recognized problem. These responses could include additional planning, more detailed technical evaluations, and possibly different land-use practices.

Where more detailed analysis is warranted, a more information-intensive model(s) can be employed specific to the identified concern. These must be developed and tested by CMER.

Specific Questions

Products

Action Plan

1) Intensive methods.
2) Hold workshop or get together with RMP's to determine which approaches seem best.
3) Identify whether existing methods can be used or modified for use. (Take a look at Klock's method.)
4) Begin an internal field trial to test technical validity of methods.

Budget

BEGIN	END	WORK	IN-KIND FY 90-91	IN-KIND FY 92-93	REQUESTING FY 90-91	REQUESTING FY 92-93
90.3	91.2	Response Variable Model Research Project	?	?	40.0	40.0
90.3	91.2	Type 4&5 Waters Charac.	--	--	20.0	20.0
90.2	91.2	Sediment transport & storage and biotic effects	?	?	25.0	?
92+		Build hazard prediction method			?	?
90.3	91.2	Cumulative Effects			40.0	?

Timeline

Integration Considerations

Sub-program

Issue

Forest Management, Sediment, and Water Quality

Rationale

Road construction, road maintenance, timber harvest, site preparation and other forest management activities can increase the rate of sediment delivery to waters. Excessive introduction of this material to aquatic systems can damage resources of public concern both onsite and downstream.

This sub-program was previously a part of Project 7.

Specific Questions

1) How effective are the current regulations governing road construction and maintenance at preventing water quality problems associated with sediment in type 1-5 waters?
2) What are the effects of the current timber harvest regulations (including the riparian regulations) on sediment introduction in type 1-5 waters?
3) Do the site preparation and rehabilitation regulations relative to heavy equipment usage, surface-water drainage and stream-channel alignment prevent sediment and turbidity problems in type 1-5 waters?

Products

1) Evaluation of the forest practice regulations as they pertain to sediment introduction to waters.
2) Develop recommendations for changes in the regulations and guidelines for minimizing sediment production associated with forest management activities.

Action Plan

1) Conduct a literature search on forest practices-sediment interactions (1990).
2) Based on the literature review, prioritize specific questions relating to sediment and develop a workplan addressing these questions (1990).
3) Implement the research program detailed in the workplan (1990-1992).

Budget

BEGIN	END	WORK	IN-KIND FY 90-91	IN-KIND FY 92-93	REQUESTING FY 90-91	REQUESTING FY 92-93	TOTAL
90.1	90.2	Liter. Rev.					
90.2	90.4	Prioritize and Workplan	110K	110K	37.5K	37.5K	295K
90.2	93.4	Implement Workplan					

Timeline

Integration Considerations

1) Sediment and Mass Wasting Committee
2) Ambient Monitoring Committee
3) Fisheries Committee

Sub-program

Issue

Large Organic Debris and Riparian Management Regulations

Rationale

Large wood is instrumental in maintaining channel integrity, regulating material movement, and providing fish habitat in streams. Timber harvest has the potential to reduce the input of this material to streams.

This sub-program was previously a part of Project 7.

Specific Questions

1) What amounts of wood are naturally found in western Washington streams and rivers in areas outside of the Olympic Peninsula and southwest Washington?
2) What is the rate of large organic debris and elimination under the current forest practices regulations in type 1, 2, and 3 waters statewide?

Products

1) Assessment of the validity of the assumptions made in developing the riparian regulations.
2) Evaluation of the effectiveness of the riparian regulations at providing wood to streams.
3) Guidelines for developing site-specific riparian management alternatives.

Action Plan

1) Survey streams and riparian zones in western Washington (1990-91).
2) Evaluate the debris input rate and its longevity in streams throughout Washington state (1990-1995).

Budget

BEGIN	END	WORK	IN-KIND 90-91	REQUESTING 90-91	TOTAL
90.1	91.4	Debris Survey	22k	15k	37k
90.1	95.4	Input and Longevity Study	10K	15k	25k

Timeline

Integration Considerations

1) Fisheries Committee
2) Wildlife Committee
3) Sediment and Mass Wasting Committee
4) Ambient Monitoring Committee

Sub-program

Chemical Application and Water Quality

Issue

Forest Chemical Application and Water Quality (#7)

Rationale

Present forest-management practices use various pesticides to control unwanted plant and/or animal species. These chemicals have the potential to adversely influence water quality.

Presently, forest managers have safety concerns and economic difficulties complying with the current forest practice regulations for fertilizer applications. Alternate plans are being used to allow fertilizer application while testing the effects on water quality.

This sub-program was formerly known as Project #7.

Specific Questions

1) What are the effects of the current pesticide application techniques on water quality?
   a) Do the current regulations prevent the introduction of pesticides into surface waters?
   b) What effect does pesticide application have on ground-water?
2) What are the effects of current forest fertilization techniques on water quality and biotic response?

a) Does application of fertilizer cause N concentrations in violation of state or federal standards for:
   - Surface water?
   - Groundwater?

b) What are the biological effects of fertilization over type 4 and 5 waters?
   - On-site?
   - Downstream?
   - Effects of repeat applications?

c) What changes in application technique or equipment can be made to minimize fertilizer application to water?
   - Application accuracy?
   - Season and rate of application, fertilizer form, and fertilizer type?
   - Frequency of application?

d) What is the technical feasibility and relative cost of compliance with the current or proposed fertilizer regulations?

Products

1) Interim Guidelines for fertilizer applications.
2) Possible revision of Washington State N standards.
3) Propose changes to forest practice regulations for pesticide and fertilizer applications.

Action Plan

1) Fertilizer monitoring studies. (1989-90)
2) Additional fertilizer monitoring for different soil types and normal operational application. (1990-91)
3) Assess validity of state and federal standards for N. (1990-01)

4) Assess biological effects of fertilizer application for on-site effects, downstream effects, and long-term influence of repeat applications. (1990-91)

5) Prill distribution study. (1988-89)

6) Prill distribution study for smaller prill. (1990-91)

7) Evaluate the different application techniques and fertilizer forms used in the northwest for relative effects on aquatic systems. (1990-91)

8) Determine technical feasibility and relative cost of suggested fertilizer regulation changes. (1990-91)

Budget

BEGIN	END	WORK	IN-KIND	REQUESTING 90-91	REQUESTING 92-93	TOTAL
1990.1	91.4	Pesticide	$85K*	$37.5K		$122.5K
1988.4	90.3	Fertilizer	$20K**			$20K

1991.1 Decision on additional chemical work $37.5K

*1/2 FTE, $60K for lab
**$45K spent 1988-89

Timeline

Integration Considerations

The Fisheries Steering Committee will provide biological criteria.

Sub-program

Temperature Prediction Methods and Riparian Management

Issue

Temperature Prediction Methods and Riparian Management

Rationale

Stream temperature alterations associated with forest management activities are of major importance in TFW timber harvest planning. Site-specific and basin temperature prediction models designed for widespread management application used in conjunction with effective riparian leave-tree regulations would allow timber harvest planning without altering natural temperature regimes.

This sub-program was formerly Project # 9.

Specific Questions

1) What model or method would accurately predict stream temperature changes in response to forest activities for:
   a) a single site?
   b) a basin?
2) Is the method applicable or can it be adapted to TFW user needs?
3) Do the current riparian regulations protect streams from thermal alteration?

Products

1) Model for predicting site-specific temperatures.
2) Model for predicting basin temperatures.
3) Characterization of stream temperature regimes.
4) Identification of temperature sensitive streams.

Action Plan

1) Identify and field test temperature prediction models (1988-1989.4).
2) Transfer technical information to TFW users (1990.2).
3) Validate basin prediction model (1990.2-1991.4).
4) Evaluate regulations (1990.2-1991.4).

Budget

BEGIN	END	WORK	IN-KIND	REQUESTING 90-91	REQUESTING 92-93	TOTAL
1990.1	91.4	Site Model	$150K	0		$150K
1990.1	90.4	Tech Transfer	$20K	$10K		$30K
1990.1	90.4	Basin Model	$20K	$20K		$40K
1990.2	91.4	Riparian Regs	$15K	0		$15K

Timeline

Integration Considerations

The Fisheries Steering Committee will provide biological criteria for the identification (screening) of temperature sensitive streams. We will interface with the Wildlife Steering Committee for their data gathered on riparian management zones. The WQSC will develop the protocol for technical transfer with FIC and TIE.

Ambient Monitoring Steering Committee Workplan Draft

Sub-program

Issue

Status and Trends of Physical and Biological Resources

Rationale

Our steering committee's responsibility is to design a monitoring program that tests the effectiveness of the Agreement. We have decided to focus on physical stream habitat because it is the basis of fish production, may be more readily measurable and understandable than less directly linked features, and may be more readily tied to management effects.

The AMSC program is also monitoring for long-term trends, a measure of the effectiveness of the TFW agreement and applications.

In the near future, we propose to include methods for biological monitoring on a field-trip basis focusing on benthic invertebrates. We want to determine if they are useful in reflecting changes in the in-channel environment that result from disturbances. The current approach is to use habitat for fish and aquatic insects as index of

change in the suitability of these habitats to support biological communities.

We are not yet doing fish or wildlife population monitoring or water-quality monitoring, but hope to include standardized methods for these resources once we understand better just what measures give meaningful information for making management decisions.

We will work with other committees to tie into the main biologically based research efforts they are conducting. If we can identify specific biological parameters we will add them to the monitoring program in subsequent years. Eventually, we hope the monitoring program will consist of elements that serve the spatial and temporal information needs of all CMER related projects.

We also have to do monitoring to meet water quality laws and convince regulators that the TFW program is working to protect this important public resource.

During the course of our monitoring program, we will need to be able to distinguish between background conditions, those associated with forest harvesting practices before the Agreement, and those since TFW. Also, within the longer geologic time scale, we need to have a sense as to where a watershed of interest is in a particular cycle of disturbance (i.e. the background condition) and how man's activities have interacted within this context.

In order for resource information to be truly useful for refining of land-use practices that provide maximum protection, enhancement, and use of the many natural resources in Washington's forests, the information gathered must suit the needs of managers, regulators, and policy-makers. Because of the inherently different timeframes and spatial scales that these decision-making groups operate on, the AMSC program was designed, and is being refined, to include data useful at both the statewide and local levels.

The AMSC program has built upon the lessons of the earlier field effort by employing a project coordinator to refine and develop a standardized, basin-level survey methodology and to provide training and technical oversight to TFW cooperators. The 1989 field project focused on characterizing fish habitat and channel morphological features in various regions of the state. The project

used a sampling methodology based on valley segment classification (the Level I Survey).

We placed particular emphasis on obtaining repeatable surveys (fixed points of reference) that in the short-term are being used to assess present resource conditions and differences in stream character within and between eco-regions and watersheds.

There are important issues and elements not included in the monitoring program (i.e. things we are not doing) but which are nonetheless important to the information needs within TFW. They include:

1) Compliance monitoring for adherence to standard rules and regulations (DNR's responsibility).
2) Biological monitoring for fish population response to in-channel changes, although we hope to include a field trial exploring a aquatic insect protocol.
3) A complete inventory of habitat features in Washington's streams and rivers (we deal only with selected subsamples of streams, and key into selected variables).
4) Data or related technical services that relate to all of the projects sanctioned by TFW (if done, this should be done as a specific group funded through CMER).

Specific Questions

1) What are the status and trends of in-stream and riparian physical and biological resources at the watershed, regional and statewide level?
2) How do these resources change over time?
3) What physical and biological variables must be measured, and to what level of detail, to provide a reliable measure of their condition.
    - Do the methods employed to measure these "cues" give us a practical set of monitoring tools that yield information that can be readily applied in management decisions?

- Are current monitoring techniques adequate and, efficient, or do we need to supplement?
- Are we reading the right signals, and are we reading them at the right temporal and spatial scales?

4) How effective is the TFW agreement in providing measurable resource protection and in providing enhancement opportunities at the site-specific, regional, and statewide scales?

5) How can differences between streams and watersheds — owing to natural variability and geo-climatic differences — be distinguished from the effects of forest practices?

6) Are TFW management practices and related decisions meeting water-quality needs and other regulatory standards? (i.e., Do current management Best Management Practices do the job in meeting resource objectives?)

7) Are current resource goals/standards appropriate?

8) What are managers/policy/regulators concepts of success from a monitoring program - expectations of the monitoring program? What is their acceptable level of risk? Will they/we know success or failure when we see it?

Products

1. Evaluation of the Effectiveness of the TFW Agreement

   The AMSC program will provide information on fish habitat and short-term stream responses to management activities. These evaluations will most likely be in the form of interpreted database reports and will feed directly into the adaptive management approach that is key to the TFW process.

   AMSC will provide guidance on use and interpretation of habitat survey data and other data collected through the AMSC program.

2. Ambient Monitoring Database

   Initially, this database will be used to report all monitoring data in a standardized format for baseline inventory and management purposes, and for other TFW research projects. As an applied research tool the database will provide:

   a) Statistically sound study design with a defensible level of confidence in the results.

b) Insight into relationships between measured variables, landscape classification(s), and management activities (see Risk Assessment-Cum. Effects)

c) Ability to quantify and test predictive stream response models

d) Integration into GIS and other resource management tools for use and access by managers.

3. Ambient Monitoring Standardized Methods and Field Manual

We have prepared a detailed field manual describing standardized techniques for describing instream and riparian habitat and channel morphology. This is"how" baseline inventory information will be collected. It's usefulness is in characterizing the stream environment for watershed and land management planning, and for assessment and/or monitoring of stream response(s) to forest practices important in cumulative effects considerations.

4. Key Watershed Characteristic Summaries

Specific past and present condition and diagnostic features of watersheds will be compiled for all or most of the 25 watersheds within which the Level I Survey work has been completed. We anticipate the same level of effort during the 1990 field season.

These features include geological history, incidence of slope failures, miles/areas and their location within the drainage network, vegetation condition and history of land use practices (grazing, mining, forest harvesting, etc.). This information is key to making sense of the Level I Survey results, especially when comparing similar valley segment types between and within watersheds in particular eco-regions.

It provides the "context" within which interpretations of the field data can be based, is key to assessing and predicting cause/effect relationships, and it builds a foundation for the beginnings of a cumulative-effects analysis.

Action Plan

1) Evaluate past season's field data -

   See if methods give reasonable readings of parameters of interest. For purposes of our landscape classification, sort data to get a sense of relationships within and between distinct valley segment types.

2) Revisit our overall study design -

   What valley segment/eco-region combination did we do, and where should we focus our future field work to ensure adequate coverage of the state?

3) Prepare descriptions of the key watershed characteristics of the basins sampled during the first two years of the field effort.

4) Generate and distribute monitoring data and summary reports to TFW cooperators and outside experts for technical review.

5) Proceed with landscape classification refinement efforts including aspects at the watershed scale.

6) Scope methods, select protocol and approach for biological monitoring (fish and invertebrates) in coordination with Fisheries Committee.

7) Conduct internal field trials of new biological monitoring techniques and evaluate results.

8) Incorporate physical variables in the monitoring program and field procedures that are determined to be critical and/or useful in predictive models.

9) Revise field procedures and variables as needed and maintain an updated field techniques manual; conduct annual training in Ambient Monitoring field methods for technical staff and TFW cooperators.

10) Proceed with the Ambient Monitoring field effort (1990 and beyond) by providing field level technical advice, review and oversight,; and as the responsible party for data compilation, interpretation, and report preparation and distribution.

11) Help plan and arrange a habitat data interpretation workshop/ conference with CMER and other Steering Committees.

Budget

BEGIN	END	WORK	IN-KIND	REQUESTING (90)	(91)	TOTAL
1990	On-going	Inventory/ Monitoring	190	100	100	200
1990	1993?	Watershed Characterization	?	25	25	50
1990	on-going	Biol. Monit.	?(EPA)	10	?	10

Timeline

Integration Considerations

The AMSC program is closely allied with the Fisheries Committee in terms of our extensive surveys of fish habitat. There exists a valuable opportunity for complementary data analysis and modification of field techniques to link Project 19's intensive work on fish/habitat relationships and population/community dynamics with the extensive habitat database being compiled by AMSC.

Preliminary discussions with the EPA indicate that there may be an opportunity to conduct a joint evaluation/field trial of the rapid bio-assessment technique. Further discussions are needed, however, and it is likely that some TFW monies will be needed as a seed or match.

The landscape classification system that is being developed and the existing valley segment description are potentially useful to all TFW research in that they will provide a common, defensible basis for describing (indexing) regional differences in climate, geology, etc. (the eco-region concept).

Sub-program

Risk Assessment and Cumulative Effects

Issue

Assessment of Risk Associated with Land Management Activities

Rationale

Resource managers need to know the extent and magnitude of the risks to physical and biological resources associated with land management activities. While the need is clear, the route to developing a practicable risk-assessment tool requires a thorough understanding of resource dynamics, i.e. the response of certain physical variables to a given input.

Development of a risk assessment tool will involve integrating resource status and trends information from the on-going monitoring effort with stream classifications and knowledge of physical and biological responses into a response variable model.

The entire risk assessment endeavor is geared toward producing 1) objective criteria and 2) a readily applied-tool for managers who make site-specific decisions on land management activities. The risk assessment methodology is also intended to be used as a significant element of cumulative-effects considerations for watershed planning and policy level decisions of regional and/or statewide scope.

Specific Questions

1) What are the physical and biological risks associated with forest management practices?
2) How can site-specific risks be assessed at the site level and in a cumulative effects framework?
3) What are the exceedance thresholds for various physical variables (beyond which deleterious/undesirable effects occur)?

Products

1) Stream Classification System
2) Response Variable Model
3) Risk Assessment Methodology

Action Plan

1) Modify and refine a stream classification methods through field trials.
2) Develop a sound Response-Variable-Method (RVM) for determining the relationships between sediment, flow, LOD and channel morphology and in-stream habitat.
3) Modify monitoring methodology (Level I) to reflect RVM considerations.
4) Identify feedback loops between RVM parameters and monitoring protocols.
5) Use monitoring data and identified trends to establish thresholds and trends.
6) Integrate stream classification, the RVM, and resource inventory and trends into a risk assessment methodology.
7) Conduct internal field trials and submit the results for critical technical review.

Budget

BEGIN	END	WORK	IN-KIND	REQUESTING (90)	(91)	TOTAL
(88)	90	Stream class.	25	35	--	35
90	93?	RVM	?	15	15	30
92	94	Risk Assessment	?	0	0	0
90	--	Cumulative Effects		15	15	30

Timeline

Integration Considerations

SHAM has expressed a willingness to share costs on the RVM and has provided input all along on the development of the stream classification system. The Fisheries Committee will be involved in determining biological risks and consequences.

Sub-program

Technical Services

Issue

Organization and Distribution of TFW Research to Cooperators.

Rationale

In reviewing the TFW research to date, it is apparent that when many of these projects are completed, there will need to be a central body/service that provides data, reports, and training to interested parties. This service will undoubtedly become a necessity as research is completed and a mechanism is needed to distribute new tools to managers and decision-makers.

The Ambient Monitoring Program is not prepared to fulfill this need beyond the scope of the information it generates. This is an important element that needs a decision by CMER.

Specific Questions

Products

1) Training in TFW management tools and how they can be applied.
2) Information on TFW research and monitoring activities, data and reports.

Action Plan

Budget

Timeline

Integration Considerations