

1.0 Initiate an Initial Writing Team (IWT)					
1.1	1.2	1.3	1.4	1.5	
When a new project is needed the AMPA is requested to form an IWT.	AMPA notifies SAGs and CMER of request, and provides 14 days to comment on project merits and to volunteer for IWT.	AMPA determines if an IWT is to be formed, and if so identifies the team.	AMPA and PM will begin to fill in the project charter.	AMPA request CMER participants provide prioritized list of objectives and potential issues the study should address.	

2.0 IWT establishes initial direction for project and Technical Writing and Implementation Group (TWIG)					
2.1	2.2	2.3	2.4	2.5	2.6
IWT develops Problem Statement, Project Objectives, and Critical Questions.	CMER provided with 14 days to review, and must approve before sending to Policy.	Provided to TFW Policy for approval and opportunity to prioritize project objectives and questions.	IWT lists skills needed in TWIG and recommends potential scientists and technicians.	CMER provided with 14 days to suggest changes and recommend additional names.	IWT develops final list and prioritizes skills and individuals for invitation to the TWIG.

3.0 TWIG formed and develops study design alternatives using best available science (BAS)					
3.1	3.2	3.2.1	3.3	3.4	3.5-3.5.1
AMPA uses prioritized list of Prospective TWIG members and skills to form the TWIG.	TWIG uses BAS to provide study design alternatives best satisfying study objectives and critical questions.	If existing science fully addresses study purposes, TWIG answers the "six questions" and gets CMER approval to send to Policy.	CMER provided with 30 days to review BAS alternatives analysis, and must approve before sending to Policy.	Provided to Policy for approval of study design alternative(s).	TWIG and AMPA may add new members to address missing skills – after providing 14 day review by CMER.

4.0 TWIG develops the full study design					
4.1	4.2	4.3	4.4	4.5	4.6
TWIG drafts a comprehensive study design.	CMER provided with 30 days to review the study design, and must approve before sending to ISPR.	AMPA submits study Design to ISPR and ensures any responsive revisions are made.	TWIG prospectively answers "six questions" and provides to CMER along with ISPR comments and revisions made to study design.	CMER provided 14 days to review revised study design and must approve sending to Policy.	AMPA submits the final study design, the six questions, and an updated estimate of the budget to Policy.

Description of Tasks:

1.0 **Initiate an Initial Writing Team (IWT)**. An IWT works with CMER and Policy to develop a joint understanding for the purpose of a new project, and assists the Adaptive Management Program Administrator (AMPA) in formulating a Technical Writing and Implementation Group (TWIG) to design the project. The IWT process is as follows:

1.1 **When cooperators (i.e. SAG, CMER, or Policy) identify the need to initiate a new CMER project they begin by informing the AMPA an IWT is needed.** A recommendation for a complete IWT may also be submitted directly as part of the notification by a SAG or CMER of the need to initiate a CMER project. Projects need not be those previously identified in the CMER workplan, but proponents should explain how the project affects the projects and priorities established in the CMER research plan and master project schedule (MPS). The intent here is to support an assessment of how agreeing to begin the proposed project will affect the overall Adaptive Management Program (AMP). This effort may benefit from providing an assessment on the relative time and costs expected for the project as compared to other projects on the MPS.

1.2 **AMPA then notifies SAG and CMER participants by email of the request to form an IWT and provides 14 calendar days to comment.** Participants should let the AMPA know if they want to participate on the IWT, or about any concerns or insights regarding initiating the project (e.g. effects to AMP budget, conflict with higher priority projects, alternative recommendations).

1.3 **The AMPA will determine if an IWT should be formed based on the available information and participant comments.** If the decision is to form an IWT, the AMPA will use the information provided to identify a team (of typically no more than 3 persons) and provide written notification to CMER, SAGs, and Policy. The AMPA may add additional IWT members if additional human resources are needed to effectively moving move the project forward. The AMPA may decline the formation of an IWT if the resources to develop the proposal do not exist, it would require reprioritizing existing Policy approved and prioritized work, or the project is not consistent with AMP goals.

1.4 **The AMPA and PM will prepare an IWT charter template once an IWT is approved.** The key elements to add at this step are: 1) the names of the IWT members and their roles (particularly lead writer), 2) a description of the project's basic purpose (refer to CMER work plan), and 3) clarification of the IWT's tasks to write or update a problem statement along with a list of objectives and critical questions for the project, and to establish qualifications needed in a TWIG for use in identifying potential members. The PM will additionally develop at this stage a communication plan for keeping interested cooperators informed at key points during the project.

1.5 **The AMPA will request CMER participants provide the PM a prioritized list of objectives and potential issues or questions the study should address, in advance of the**

first meeting of the IWT. CMER participants are to be provided with any background materials available to help in understanding the project purpose (e.g. relevant sections from the workplan, draft charter, transmittals from cooperators proposing the project). Participants will be provided 14 calendar days to provide recommendations. The PM will consolidate and forward this input to the IWT prior to their first meeting.

2.0 IWT establishes initial direction for CMER project.

2.1 IWT develops Problem Statement, General Study Objectives, and Potential Critical Questions to provide direction for a TWIG in developing study design alternatives, and to ensure agreement by Policy and CMER about the purpose of the project. Descriptions in the CMER workplan (e.g. project status, CQ's), initial suggestions from CMER and SAG participants from step 1.5, and consultation with SAGs knowledgeable about the project should be used as a starting point for this task.

- The problem statement should provide the rationale for why research is needed and include a summary of problem/issue history (i.e. specific rule/BMP, intent of rule, and concerns).
- The General Project Objectives provide an initial opportunity to explain what part of the problem the study is intended to address. In addition to the General Project Objectives, explain how the proposed project fits within the CMER research plan (e.g. project history, research priorities/changes, identification of relevant CMER studies).
- Critical Questions at this stage in the process are established to help clarify the potential scope and focus of the research effort and may or may not be suitable as research questions as written. These initial critical questions may be refined into stronger research questions in the later stages of developing research design alternatives and testable hypotheses. Good questions are ones that are clear and concise, manageable, and identify response variables relevant to decision makers and serving the purposes of the AMP research program. Where appropriate, good critical questions:
 - define unit to which you want to draw inference (e.g. Np stream, forested wetland)
 - identify the BMP/rule, policy, or action that is in question (e.g. harvest of forested wetland)
 - identify outcomes important to inform Policy and the AMP process (e.g. meets performance target for temperature in Type F waters)
 - specify priorities where there are multiple questions

2.2 Study objectives, problem statement, and critical research questions proposed by the IWT are to be provided by email to CMER and the SAGs for 14 calendar day review and approval (by vote at a CMER meeting). IWT will revise the problem statement, objectives, and critical questions as needed based on CMER-SAG review.

2.3 The revised study problem statement, objectives, and critical questions are to be provided to Policy for review and approval as part of their regular monthly meeting process. CMER is asking for Policy consensus that the problem statement and study objectives adequately reflect the research interests of Policy, and is further asking Policy to ensure their research needs have been discussed and are represented in a prioritized (high to low) list of critical questions. This is necessary to ensure these issues will be weighed appropriately by the TWIG as they begin their review of the science and develop recommendations for the best overall study design(s) to inform the AMP. This process will generally require discussions with the IWT at two Policy meetings. The purpose of this step is to set the overall direction of the TWIG's work. Typically, at the first meeting Policy would provide guidance to the IWT, and at the second meeting, Policy would review the proposal for consistency and final approval. It is important that Policy be advised the specific wording of the potential research questions will likely be refined by the TWIG as they develop recommended alternatives, and testable hypotheses. Policy should be also be reminded no single study design may effectively address all the identified questions or even the full geographic expression a particular question. Thus the recommendation by the TWIG of specific study design alternatives may be based on emphasizing, for example, one set of critical questions or one set of response variables over others.

2.4 The IWT develops a list of specialized skills needed for the TWIG based on the subject-matter contained in the project objectives and critical questions, and then creates an initial list of recommend scientists and technicians.

2.5 The list of skills and names of potential TWIG members are sent to CMER-SAGs for informal 14 calendar day review. The IWT will describe the basis for their recommendations and request the names of other qualifying persons and important missing disciplines.

2.6 The IWT will develop a final list of prospective TWIG members, and with assistance from the AMPA and PM will prioritize scientists within sub-disciplines for invitation to the TWIG. *The work of the IWT is now complete.*

3.0 TWIG conducts Best Available Science (BAS) review in support of developing a study design.

3.1 The AMPA will contact prospective TWIG members and form the TWIG. The AMP will check the interest and availability of prospective TWIG members to participate through the BAS alternatives analysis and study design phases and invite participants based on their availability and relative priority ranking. The AMPA and PM will develop a charter for the work of the TWIG once membership is established. The charter should acknowledge membership may change as the project moves through the BAS and study design stages

based on availability and the changing needs for specific skill sets, and that consultation or contracting with outside experts and consultants are additional tools the TWIG can potentially use to accomplish the necessary work.

3.2 TWIG develops a document describing how BAS informs the problem statement, study objectives, and critical questions; and supports preferred and alternative study designs.

CMER is an applied science research entity. CMER exists to provide policy makers with information they can use to make improvements, where needed, to the state forest practices rules and programs. The purpose of this step is to ensure the AMP science program: 1) is using the best overall study frame and data collection methods to answer the critical questions, and is 2) focused on addressing elements of the rules associated with greater scientific uncertainty and relative risk of not meeting the established goals, resource objectives, and performance targets. Alternatives should all be serious proposals which if chosen would effectively address the study objectives to an extent that would inform decision makers at TFW Policy and the Forest Practices Board. Alternatives may reflect the need to restrict the number of critical questions, response variables, geographical settings, or test strata in order to develop a manageable and scientifically robust study framework. In developing alternatives it is typically important to establish context for how the applicable forest practices (rule/BMPs) are being implemented (e.g. region affected, frequency, problems); and a statement of what we know/don't know concerning uncertainty about this problem/issue. If no feasible alternatives are available, provide rationale for why only one approach is being proposed. The TWIG should provide estimates of the budgets and timelines for the alternatives to assist decision makers in choosing between alternatives.

3.2.1 If the TWIG concludes existing science has adequately addressed the purpose of the study and no further research is needed it must get CMER concurrence and document the basis in the "six questions" for Policy.

3.3 CMER must approve the BAS alternative analysis document before transmittal to Policy. CMER will be provided with 30 calendar days to review the BAS alternative analysis document. A cogent written science-based argument must be provided by CMER members voting against accepting the document. CMER participants may provide additional study alternatives and recommendations for the TWIG to consider in revising the BAS alternative analysis document so long as these recommendations and the relationship to BAS is well documented.

3.4 Policy must approve a study design alternative(s) before the TWIG writes the detailed study design.

3.5 If the TWIG determines there are gaps in the design team's (TWIG) skills, they will work with the AMPA to add new members to assist in writing the study design. The TWIG may alternatively choose to consult with regional experts on specific design issues/concerns rather than expand the formal membership of the TWIG. TWIGs are to remain small teams,

but their membership may change in response to changes in member availability or changes in the need for specific expertise and skill sets.

3.5.1 CMER and SAGs will be provided with 14 calendar days to review any changes to TWIG membership or to the qualification for TWIG membership. CMER participants may propose alternative recommendations for new team members who have the same skills as that needed.

4.0 TWIG develops the study Design.

4.1 The TWIG drafts a comprehensive study design. The study design document must contain the level of detail and supporting references needed to successfully undergo Independent Scientific Peer Review (ISPR) and to be implemented by another entity with no further guidance by the TWIG.

4.2 CMER must approve the study design as ready to go to ISPR. A copy of the study design will be provided to CMER for a 30 calendar day review and approval. Not all CMER study designs need to go to ISPR, however, as a general rule ISPR should occur for study designs associated with any significant (e.g. costly or complicated) project and for any project that may lead to recommendations regarding rule effectiveness. Whenever CMER approves a study design as being ready to go to ISPR they are indirectly authorizing the study to go into implementation if no significant concerns are raised through the ISPR process.

4.3 Study design submitted by AMPA to ISPR. The AMPA will submit the CMER approved draft study design and any supporting materials to ISPR. Comments received from ISPR are to be considered for preparing revisions to the study design. A response matrix explaining the disposition towards making suggested changes and revised draft report language should be developed and resubmitted to the ISPR associate editor. The editor, working with the ISPR panel, will inform the AMPA whether the TWIG responses and proposed changes are sufficient or whether fatal flaws remain that should be resolved before moving forward with the project.

4.4 The TWIG will prospectively answer the “six questions” in preparation for submittal to policy. The TWIG will answer the “six questions” based on their expectations on how the study will be conducted and the scope of the expected findings. TWIGs consisting primarily outside scientists are advised to seek counsel from SAGs tasked with similar topics (e.g. riparian processes, mass wasting, and wetlands) and/or the AMPA when developing their prospective answers.

4.5 CMER must approve the “six questions” document and the revised study design prior to submittal to Policy. Copies of the ISPR comments, a revised study design, and the prospective answers to the “six questions” will be provided to CMER for a 14 calendar day review and approval. CMER concerns at this stage must be based on problems created by

the revisions to the study design or new issues brought to light by the review that were not directly settled to the satisfaction of the ISPR editor.

4.6 TWIG will submit the final study design, an updated budget based on the recommended approach for project implementation, and answers to the “six questions” to Policy. Policy will be asked to prioritize the study in the budget and allocate sufficient funding and staff resources for implementation. In order to develop a better estimate of the budget, the PM should work in consultation with CMER-SAGs and the TWIG to identify a recommended framework for implementing the project. ***The TWIG’s work is done at this point.***

5.0 The PM will initiate internal or external processes and contracts to implement the project.

6.0 The CMER workplan will be updated to include the project. This includes providing an updated description of the project in the workplan. This step is also to be used to identify critical questions raised in the TWIG process that ultimately could not be addressed in the chosen study design, and to include them as appropriate in the workplan so they will not be lost.

As the CMER workplan is updated, upcoming projects should receive special attention. This includes establishing or updating problem statements, study objectives, and potential critical questions. These changes should also be highlighted for discussion with TFW Policy.