

## CMER Request

<b>Proponent:</b> RSAG	<b>Date:</b> August 20, 2018
<b>Contact:</b> Joe Murray	<b>PM:</b> Teresa Miskovic
<b>Project Name/Issue:</b> Riparian Characteristics and Shade Study	
<b>Request:</b> CMER approval of: 1) a revised alternate budget estimate for Alternative 2, and 2) an estimated cost for contracting out the study design phase; this information respond to the specific requests of TFW Policy.	
<b>Funding Source:</b> Master Project Schedule	<b>Urgency:</b> High
<b>Request Description:</b>	
<p>At the August 2, 2018, TFW Policy meeting:</p> <ul style="list-style-type: none"> <li>a) Policy voted to accept for further consideration Alternatives 1 and 2, but dismissed Alternatives 3 and 4. This was done to narrow down the field of potential project designs to consider further.</li> <li>b) Policy then requested that RSAG/CMER provide a revised estimate of the cost of Alternative 2 (the most expensive of the choices) showing how the annual costs would change if the study was spread out over more years.</li> <li>c) Finally Policy wanted RSAG/CMER to consider if they should be requesting budget dollars to develop or help develop a study design. This was in recognition that RSAG may chose not to do this work completely in-house. If a budget for study design is provided, Policy may place it “below the line” on the Master Project Schedule; enabling it to be potentially funded should any unspent monies become available for the projects prioritized above the line for the biennium.</li> </ul> <p>RSAG developed a revised budget for Alternative 2 (shown below) that spreads the costs out over four rather than two field seasons. The total project costs increase by a little less than \$100,000. The added costs come from the increase in pre-season coordination and site acquisition work associated with having more years in the field.</p> <p>CMER has budgeted values from \$50,000 to \$100,000 for contracting out the development of a study design. RSAG recognizes that the RCS study is a relatively simple study and the scoping document provides substantial details already. Therefore RSAG requests CMER approve a request for Policy to place \$50,000 in the MPS below the line for contracting out finalization the study design development.</p>	
<b>Alternative 2:</b>	
<p>Alternative 2 follows the design and includes all of the measurements and outcomes of Alternative 1, but also: a) increases the number of stand, shade, and solar energy metrics monitored, b) collects these measurements at three heights over the stream and within the riparian management zones to reflect potential differences in vegetative structure, c) increases model refinement analyses, and d) revises the SHADE.xls model based on the study results. The effect of adding the additional field metrics is to double of the field personnel crew from 2 to 4 persons and to increase the costs of monitoring equipment. The addition in field metrics will also require a more extensive analysis of the metrics and their effect on shade/energy. The analyses in Alternative 2 would be kept relatively straightforward, but including exploratory modeling using multi-factor regression and step wise model refinement would warrant consulting with an</p>	

independent statistician along with the cost of adding a modeler to test and capture any potential improvements in a revised SHADE.xls model. This is expected to add two months to the time needed for analysis, report writing, and model revision. The following cost assumptions cover the full statewide study (16 blocks) unless stated otherwise:

**Project Coordinator: \$60,000.** Based on one person working half-time for 10 weeks (200 hours) at \$100/hour to conduct site-acquisition (\$20,000) and working half-time to coordinate harvests and monitoring over two 10-week field seasons (\$40,000). **(Estimating it will take a 8 weeks prior to each field season working half-time for a contractor at \$100/hr (2,000/wk) to identify and gain access to field sites. Thus \$16,000 per year for the four field seasons to cover the cost of site identification and acquisition. In addition the contractor would be working half-time at 100/hr (2,000/wk) to coordinate harvests over a 5 week field season, plus a 1-week for pre-season coordination with harvesters and field monitoring team would be \$12,000 per year. The total cost for the project coordinator would be \$28,000 per year and \$112,000 over the four years of the study. (Note: some increased per project costs occur when work is spread out over more years to allow sufficient response and preparation time for each field year. A risk is the per-year cost will not be sufficient to gain the interest of a qualified contractor).**

**Marking Stands for Harvest and Shade Monitoring: \$297,500.** Based on a 4-person field team working full time at \$13,500 per week (with wages, overhead, travel, and lodging) over a five week field season plus two weeks to cover pre-field preparation would be \$94,500 per year for the four year study period for a total project cost of \$378,000.

**Harvesting to Prescriptions: \$160,000.** Based on assuming a two person per day level of effort at \$100/hour would be \$8,000 per week continuously over a five week field seasons plus 1 week for pre-season coordination 48,000, plus one day (\$1,600) per year for pre-season coordination would be \$49,600 per field year.<sup>1</sup>

**Data Analysis and Report Writing: \$96,000.** Based on assuming the added exploratory analyses is expected to increase the time needed to analyze the data and develop a study report by one month compared with Alternative 1. Four months at \$100/hour would be \$64,000. The additional modeling and model revision and documentation work is expected to require two months at \$100/hour (\$32,000).

**Alternative 2 Preliminary Budget Estimate: \$621,055 statewide or \$344,500 eastside.**

**Special Equipment Costs: \$28,055-\$42,705.**

- Fish Eye Camera and Hemi-view software (or equivalent) to measure overhead cover and effective shade **\$500-\$10,550.** Cost can vary substantially. If over-counter camera (\$375.00) and leveling tripod (\$125) and freeware are used, compared to a dedicated HEMI-DC camera system (\$6,800) and HemiView Software (\$3,250) purchased from vendor.
- Li-Cor LAI 2200TC at **\$16,125** to measure leaf area index for calculating light extinction coefficients.
- Thermopile Pyranometer arrays to measure global solar radiation. **\$11,030 min.** [(Apogee SP-510 \$295.00 each sensor or Campbell Scientific CS320 or Kipp and Zonen SP) and

<sup>1</sup> Costs for harvest may be reduced if landowners rather than contractors agree to harvest their own lands.

minimum array of 9 per treatment site plus offsite open-view control (min 27 units), and leveling base plates (AL-100 \$35.00 ea) and stands (?) and 2-4 data meters (LI-1500 \$355.00 each or CR300 for LOGBOX SE by Kipp and Zonen with allows for up to 8 radiometers)].

- Towers to collect shade/energy samples as an array at multiple heights off the ground. **\$400 to \$5,000**. Price varies substantially from each with decision based on final height required in final study design and whether sequential sampling can be used an enable a single portable tower to be used in.

Table 3: Project costs estimated by year and expenditure type.

<b>Alternative 2</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Total Cost</b>
<b>Statewide</b>	<b>\$200,155</b>	<b>172,100</b>	<b>172,100</b>	<b>172,100</b>	<b>\$96,000</b>	<b>\$716,455</b>
<i>Equipment</i>	28,055					
<i>Site Acquisition</i>	16,000	16,000	16,000	16,000		
<i>Harvest Coordination</i>	12,000	12,000	12,000	12,000		
<i>Harvesting</i>	49,600	49,600	49,600	49,600		
<i>Field Work</i>	94,500	94,500	94,500	94,500		
<i>Analysis-Reporting</i>					96,000	
<b>Eastside only</b>	<b>\$200,155</b>	<b>172,100</b>	<b>\$96,000</b>			<b>\$469,255</b>
<i>Equipment</i>	28,055					
<i>Site Acquisition</i>	16,000	16,000				
<i>Harvest Coordination</i>	12,000	12,000				
<i>Harvesting</i>	49,600	49,600				
<i>Field Work</i>	94,500	94,500				
<i>Analysis-Reporting</i>			96,000			

For comparison, the following is Table 3 from the CMER approved scoping document:

Table 3: Project costs estimated by year and expenditure type.

<b>Alternative 2</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Total Cost</b>
<b>Statewide</b>	<b>\$276,555</b>	<b>248,500</b>	<b>\$96,000</b>	<b>\$621,055</b>
<i>Equipment</i>	28,055			
<i>Site Acquisition</i>	20,000			
<i>Harvest Coordination</i>	20,000	20,000		
<i>Harvesting</i>	80,000	80,000		
<i>Field Work</i>	148,500	148,500		
<i>Analysis-Reporting</i>			96,000	
<b>Eastside only</b>	<b>\$248,500</b>	<b>\$96,000</b>		<b>\$344,500</b>
<i>Equipment</i>	28,055			
<i>Site Acquisition</i>	20,000			
<i>Harvest Coordination</i>	20,000			
<i>Harvesting</i>	80,000			
<i>Field Work</i>	148,500			

<i>Analysis-Reporting</i>		<i>96,000</i>		

<b>History and Context:</b>				
X = Done @ = Request	Project Management Stage	Iteration #	X = Waived	Date Approved
	<b>Final Report</b>			
@	Final CMER Approval			