

## Electronic Monitoring Workgroup

November 28-29, 2016 | Seatac, WA

**Memo RE: Next steps in EM cost/budget evaluation as related to future ADPs<sup>1</sup>**

### **Purpose:**

In October 2016 the Council identified a (preliminary) preferred alternative that would allow the use of EM technology for catch estimation. In doing so, the Council instructed the public and the EM Workgroup (EMWG) that “*Work should continue to develop the necessary annual analysis for determining the EM selection pool and balancing EM deployment with deployment of observers within budget.*” Once EM is integrated into the Observer Program, staff will need to determine each year how to allocate monitoring resources between the EM stratum and the human observer selection strata, and do so within the constraint of a budget that varies annually. Completion of that exercise requires two steps on the EM side: (1) drafting and approval of an annual EM deployment plan that is likely to achieve monitoring goals in a cost-conscious manner, and (2) estimation of the cost to deploy that recommended plan so that Observer Program staff can determine trip selection probabilities for all strata in the partial coverage category.

This memo highlights the following **questions** that should be considered by the EMWG:

- What is the role of the EMWG in the deployment planning and budgeting process after integration, if any?
- Which EM ‘program design elements’ can be adjusted on an annual (or periodic) basis in order to achieve cost effectiveness?
- How can the quantity and quality of information available to the person(s) responsible for EM cost-modeling be maximized?
- Who is responsible for estimating the annual cost of the EM deployment plan, and when?
- What steps are necessary to build the EMWG and the public’s confidence in the annual process of estimating EM costs? Is there an opportunity for an iterative process to develop and test a cost model between the present time and the point at which EM deployment becomes funded from the pool of industry-paid monitoring fees? Should any resulting work products be made available to and/or reviewed by the public (EMWG, Council, etc.)? If so, should this work be integrated into an existing reporting document (e.g., Observer Program Annual Report)?
- How will cost analysis and deployment planning take into account the value of additional data from higher sampling rates in the EM stratum? (E.g., 50% trip selection probability for EM pot vessels versus 3% for non-EM pot vessels.)

The Council statement referenced above recognizes that the October 2016 analysis sufficiently identified and categorized EM cost drivers, but did not have the information necessary to develop a predictive EM cost model that can be used to plan the future deployment of monitoring resources. The primary reasons that the analysis did not result in a model are:

- The best approximation of a deployed EM program – the 2016 hook-and-line EM pool – was midway through its operating year, thus hardware purchasing and field service expenditures were still being made.

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<sup>1</sup> Prepared by Sam Cunningham (NPFMC staff), Dan Falvey (ALFA), and Howard McElderry (AMR)

- Expenditures were not necessarily tracked in a manner that allowed analysts to separate purchases of hardware used in 2016 from hardware pre-purchased for a larger, fully integrated program (this was partly due to the fact that two of the 2016 selection periods had yet to occur, and it was not possible to know how many EM vessels would be selected for the first time in the latter half of the year). Also, field service expenditures were not necessarily tracked in a manner that separated one-time events from recurrent events.
- The EMWG and the Council had not agreed upon clear distinctions between program design elements that could be altered through the annual deployment planning process to control costs and elements that must be maintained to preserve the Observer Program's random sampling design.

Looking ahead, the EMWG could define a list of **goals** related to the establishment of a cost estimation procedure that has the group's confidence and offers transparency in how deployment decisions will be made. These goals could be articulated to the Council when it considers final action in December 2016. The following is a starter list, to which the EMWG may add, subtract, or modify:

- Refine the estimate of the 2016 hook-and-line EM Pre-Implementation program's actual cost, given year-end information.
- Develop a predictive cost model for 2017 EM deployment in the hook-and-line and pot gear sectors. The model should produce High, Medium, and Low projections on an annual and per-day basis that account for the known variability in the demographics and activity of the vessels that opt into the 2017 EM pool and the subset of vessels that are selected for EM coverage.
- Evaluate the model's predictions relative to actual costs at the end of 2017.

Achieving those goals might involve the following **steps**:

1. Categorize program design elements that affect costs in three dimensions:
  - Whether the cost is incurred as:
    - *One-time* human capital/labor
    - A *recurring* annual expenditure
    - A capital investment in hardware that can be *amortized* on a predictable schedule
  - Whether they can/cannot be adjusted to control the annual cost of EM deployment (within the constraint of the Observer Program's sampling design protocol)
  - To the extent possible, elements could also be annotated to indicate whether their inclusion/exclusion in the deployment plan has a large or small potential cost impact
2. Standardize the metrics by which EM providers track costs across *all* EM programs (hook-and-line, pot, NMFS R&D)
3. Using the Council's approved 2017 EM deployment plan as a starting point, develop a model to predict the program-level and per-day costs. Produce High/Medium/Low estimates that account for finalized selection probabilities, projected fishing effort among selected EM vessels, and levels of field service that are dependent on the composition of the subset of the EM fleet that is selected for coverage.
4. Evaluate the model's predictions
5. Re-estimate the cost of the 2016 hook-and-line EM Pre-Implementation program using the best available information

This memorandum includes two attachments as tables.

- **Attachment 1:** A draft table that categorizes program design elements by (A) which entity could make decisions that determine cost impacts, and (B) whether or not the design element can be shaped annually through the EMWG or ADP process.
  - A. Entity:
    - Regulation; ADP/EM ADP; contracted EM provider; PSMFC; provider bidding contract; NMFS
  - B. Ability to control cost:
    - Green – Can be determined annually
    - Yellow – To be determined
    - Red – Would be set in regulation
  - C. Potential magnitude of cost impact [*Not Shown*]. Cells could be marked “Large,” “Small” or assigned a value on a different scale. The EMWG might wish to discuss what level of precisions is appropriate and supported by available information.
- **Attachment 2:** A draft table that categorizes hardware and field service cost elements by whether or not they are One-Time, Recurrent, or Amortized expenditures. EM providers (hook-and-line, pot, and NMFS research and development) could use this uniform framework as a starting point to develop a standardized cost-reporting methodology that will improve the deployment planning process. One cell in each row would be “checked” as providers agree upon the appropriate classification.

**Attachment 1:**

Category	Action	Regulation	ADP	EM ADP	Field service	PSMFC	Contract	NMFS
EM Hardware	Optimize inventory/shipping				Green			
	Reduce # of cameras/sensors				Green			
	Eliminate at-sea data transmission							Green
	Extend amortization period				Green			
	EM hardware replacement policy periodic vs. continuous							Yellow
	EM hardware replacement policy fee vs. non fee funds							Yellow
	VMS		Red					
EM pool qualifications	Require vessels to purchase	Red						
	Increase/decrease # vessels		Green	Green				
	Limit geographic scope		Green	Green				
	Minimum # trips to qualify			Yellow				
	Limit future new EM vessels			Yellow				
	Require EM on specific vessels	Red						
	Cooperatives	Red						
Sampling design	Selection rate		Green	Green				
	Zero selection for min # trips		Green	Green				
	Stabilize sampling design		Green	Green				
	Minimum coverage requirement			Yellow				
	Period vs trip selection			Yellow				
	Non-random sampling design		Red	Red				
	Field services	Minimize vessel "touch" time				Green		
Optimize FTE/Contract staff ratio					Green			
Increase phone support					Green			
Limit remote port service events					Yellow			
Limit technical support hours					Yellow			
Use FTE staff to full capacity (local data review, extra service calls etc.)					Yellow	Yellow		
Optimize provider contract (single, multiple, general)							Yellow	
Differential vessel charges		Red						
Data review services	Lower vessel selection rates					Green		
	Reduce complexity of review protocols					Green		
	Sub-sampling					Green		
	Incorporate local data review					Yellow		
	Use non-fee based funds							Yellow
	Require vessels to purchase data services	Red						
	Logbook audit	Red						
Other	Develop analytical tools to streamline decision making		Green	Green				Green
	Improve "business rules" for day-to-day operation		Green	Green	Green	Green		Green
	Reduce # planning meetings		Green	Green	Green	Green		Green

**Attachment 2:**

<b>Program Cost Element</b>	<b>One time</b>	<b>Recurrent</b>	<b>Amortized</b>
<b>1. Project Coordination</b>			
a. Operations Management			
b. Program Analysis and Review			
<b>2. EM Equipment Services</b>			
a. Equipment Provision			
b. Inventory Management			
c. Product Support			
<b>3. Field Technical Services</b>			
a. Port Services Development			
b. Installation Services			
c. Routine Vessel Services			
d. Technical Support			
<b>4. Data Analysis Services</b>			
a. Analysis Design			
b. EM Data Interpretation			
c. Data Analysis and Reporting			
d. Hard Drive Management			