Northwest **Power** and **Conservation** Council

July 6, 2016

MEMORANDUM

TO: **Council members**

FROM: **Patty O'Toole, Program implementation manager**

SUBJECT: **Presentation on research budgets and reporting as part of the Research Plan development**

BACKGROUND:

Presenter: Tom Karier, Washington Council Member

Summary: Tom Karier will present a summary of work on recent expenditures for research, monitoring, and evaluation for fish and wildlife and lead a discussion about how the Council can develop future research priorities.

Relevance: Updating the Council's Research Plan is relevant to the Council's Fish and Wildlife Program priority #2: Implement adaptive management (including prioritized research on critical uncertainties).

Background: The 2014 Fish and Wildlife Program describes how the Council will develop a new research plan by working with regional managers, independent science panels, and BPA. It also states that "The review will begin with an update of how previous research funds were allocated to particular categories and critical uncertainties." P. 104. This presentation begins the process of reviewing past expenditures as a first step for setting future priorities.

More Info: This agenda item will address task 3 in the draft work plan for updating the Research Plan (May 3, 2016).

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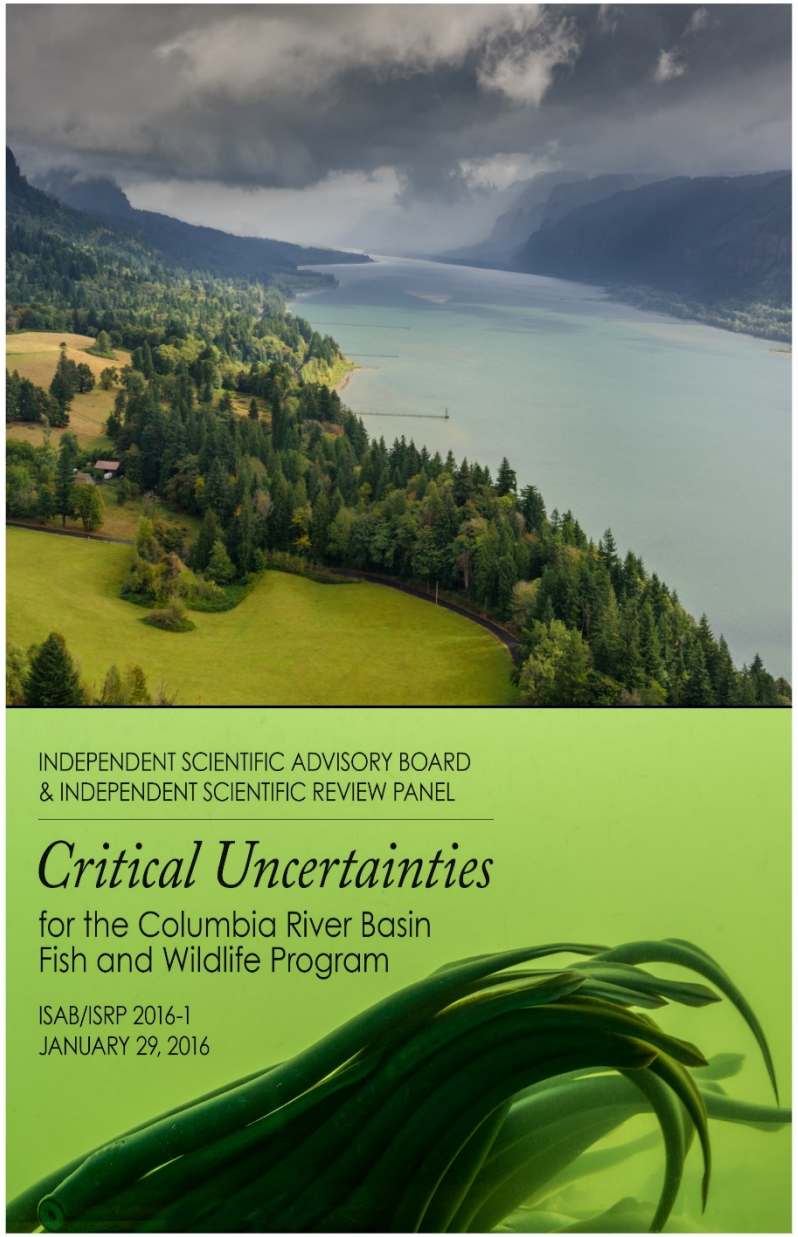
Elements of a Research Plan and Possible Priorities

July 12, 2016



Three Key Elements of a Research Plan

Examples:

Critical Uncertainties

1.1 To what extent do tributary habitat restoration actions improve the survival, productivity, distribution, and abundance of native fish populations?

Budget Priorities

By Themes: 1) Hatcheries 2) Habitat 3) Monitoring methods…
And Within Themes: 1) Evaluate current actions 2) Identify new actions

Implementation Plan

1. Research projects will submit an annual progress report based on the reporting template and a final report when the project is completed.
2. ….

Why distinguish between research and monitoring?

They both can address critical uncertainties.

Is the purpose of the project to answer questions or provide data?

Research → Answer questions.

Monitoring → Provide data.

Examples:

- Are current projects producing the expected results? (Action Effectiveness)
- What is the mortality rate on steelhead caused by pinnipeds? (Critical Uncertainties)

Key Elements:

- Hypotheses
- Methodology (Before/After, Control/Impact)
- Results
- Conclusion, Lessons learned
- Timeline

Examples:

- Status and trends for fish and habitat
- Number of salmon and steelhead crossing Bonneville dam.
- Implementation monitoring: fences up, channel open,…

Key Elements:

- What data is collected?
- When, where, and how is the data collected?
- Where is the data available?

Before moving forward, where have we been?

Review and Update the Research Plan

“The review will begin with an update of how previous research funds were allocated to particular categories and critical uncertainties.”

2014 Fish and Wildlife Program, p. 104

Analysis of 186 projects with RM&E from the ISAB critical uncertainties review.

200205300	200901400	199701900	199900301	201003300	198902401	200302200	200600600
200206800	198710001	199404700	200725200	198335003	199604000	200831100	200800700
200207000	198710002	200811100	198605000	201201300	200900100	199102900	200201100
200206100	198802200	199201000	200811600	199800702	199506335	200203200	200301200
201007500	200003900	200717000	200200200	199800704	199506325	199902000	199802200
200000100	200739600	200201301	200300700	199800703	200500200	201003500	200600300
200722400	200902600	200810400	200301100	200708300	200740100	201003000	200600500
199404200	199801900	200820600	201000400	199202604	200740500	201003200	199608000
199802800	199603501	200860800	201007000	200740400	199501300	199402600	200000900
200830100	199206200	199008000	199801400	198805303	199104600	200830800	200002700
200830600	200847100	198712700	200300900	198805307	198503800	200847000	200103300
201201500	200890400	199403300	200900800	198805304	199501500	201101400	199206103
200900400	200724600	199602000	199702400	198805308	200740200	200715700	
199202601	200700300	199302900	199007700	199005500	198806400	200810900	
199801600	199004400	200304100	200800400	198909800	198201301	199404300	
200001500	200103200	199102800	201007600	199107300	198201303	200811500	
200104101	199101903	198910700	200871000	199703000	198201304	200830700	
200739700	199101901	199601900	198909600	199701501	201003600	200850300	
199705600	200203700	199105100	199305600	200302300	200850200	200850400	
201002800	198806500	200851800	200900900	199604300	200206000	200890700	
200715600	199404900	200890800	200203100	200740300	200810500	201002600	
199405000	199500400	200852400	200303900	200890500	199306000	201003100	
200205900	199501100	200600800	200305400	201005000	200102800	200301700	
200890300	199001800	199700400	200306300	199000500	200900500	201100600	
201007700		199502700	200729900	199000501	201003400	198331900	

RM&E was extracted from projects with other purposes by using work elements.

- 70 - Install Fish Monitoring Equipment
- 156 - Develop RM&E Methods and Designs
- 157 - Collect/Generate/Validate Field and Lab Data
- 158 - Mark/Tag Animals
- 159 - Transfer/Consolidate Regionally Standardized Data
- 160 - Create/Manage/Maintain Database
- 161 - Disseminate Raw/Summary Data and Results
- 162 - Analyze/Interpret Data
- 182 - PIT Tags
- 183 - Produce Journal Article

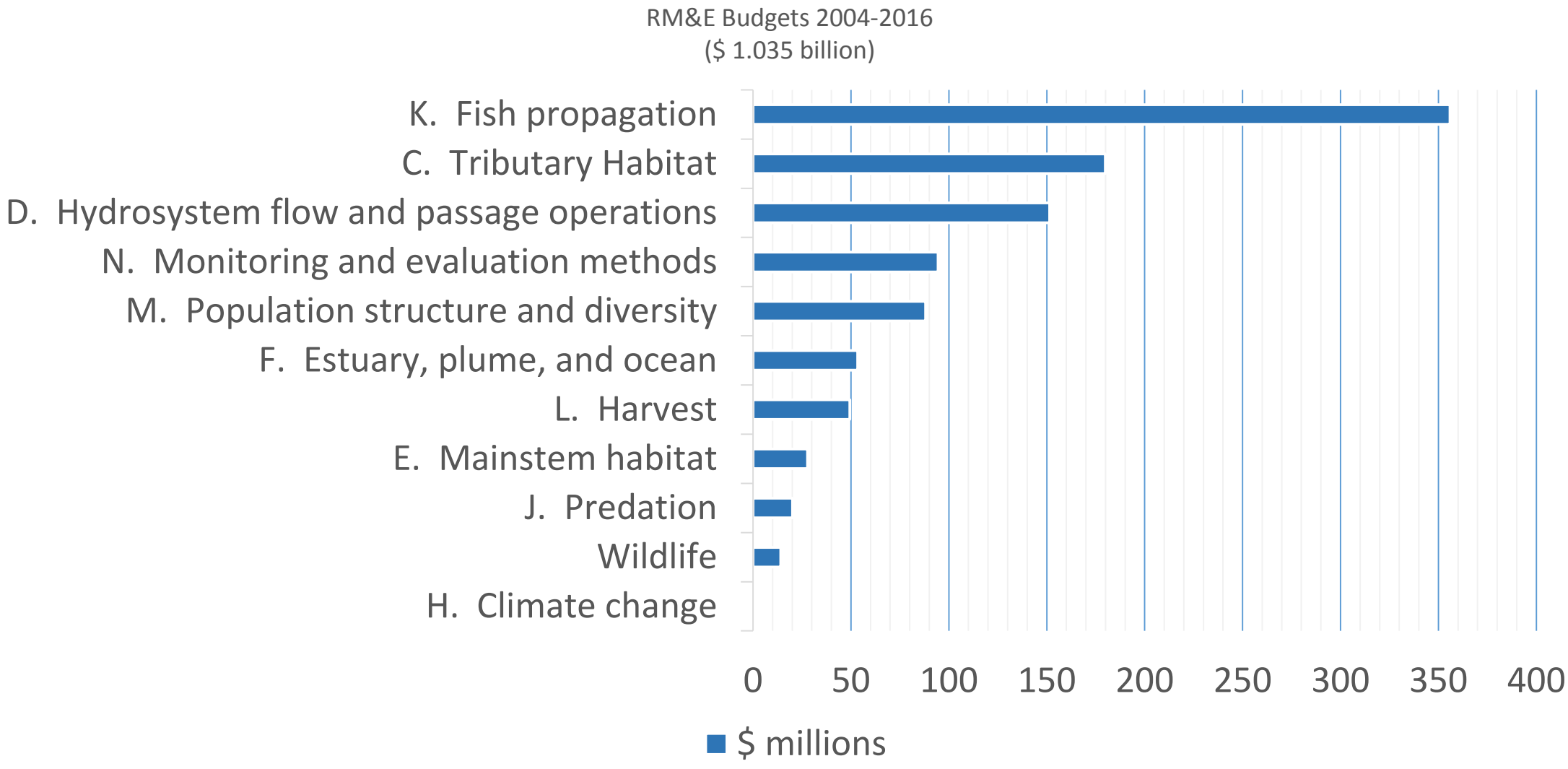
	Pure RM&E	Partial RM&E
Number of Projects	77	97
2016 Budget	$49 million	$40 million
Percent of total annual RM&E Budget	55 percent	45 percent
Percent of Project Budget	100 percent	31 percent

RM&E is estimated by work element budgets plus overhead (18%) for those projects that are less than 100 percent RM&E.

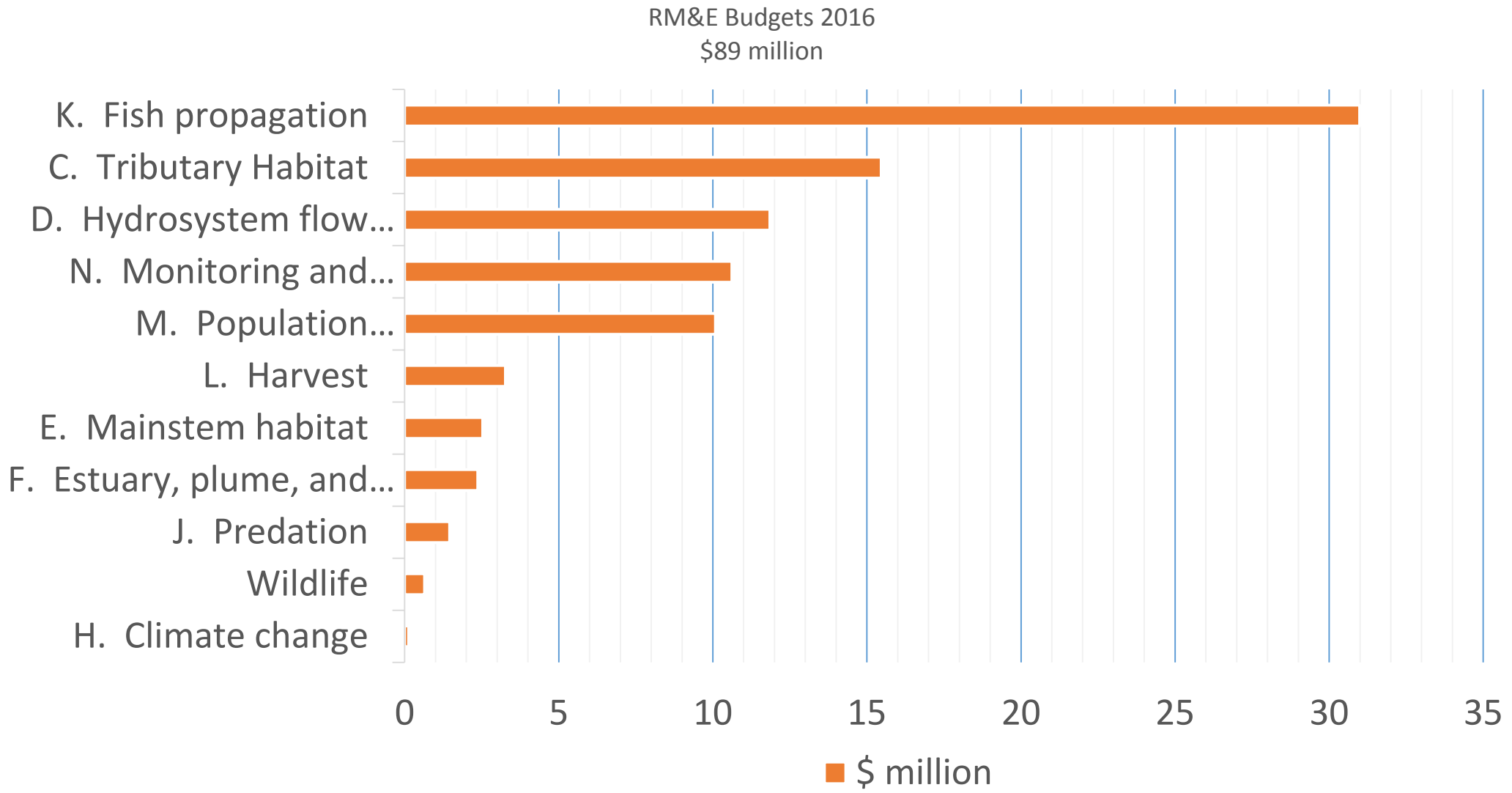
RM&E budgeted totals:

FY 2016 Budgeted	$89,387,576
FY 2004 to 2016	$1,035,594,988

Fish propagation has been the priority in RM&E budgets for more than a decade.



Fish propagation continues to be a priority in the 2016 budgets



Rank in budgets	Theme	2006 Research Plan Critical Uncertainty	ISAB Progress	ISAB Criticality	RME Budgets 2004-2016
1	Fish Propagation	What is the magnitude of any demographic benefit to the production of natural-origin juveniles and adults from the natural spawning of hatchery-origin supplementation adults?	Medium	Priority	$73 million
2	Fish Propagation	Can the carrying capacity of freshwater habitat be accurately determined and, if so, how should this information be used to establish the goals and limitations of supplementation programs within subbasins?	Medium	High	$66 million
3	Fish Propagation	What are the range, magnitude, and rates of change of natural spawning fitness of integrated (supplemented) populations, and how are these related to management rules, including the proportion of hatchery fish permitted on the spawning grounds, the broodstock mining rate, and the proportion of natural origin adults in the hatchery broodstock?	Medium	Priority	$44 million
4	Tributary and Mainstem Habitat	To what extent do tributary habitat restoration actions affect the survival, productivity, distribution, and abundance of native fish populations?	Medium	Priority	$40 million

High spending on critical uncertainties doesn't guarantee progress

The top 24 projects account for half of the total RM&E budgets ($500 million).

BIOP RM&E	Title	Proponent organizations	Total RM&E Cumulative Budget millions of dollars (2004-2016)
Yes	Yakima River Monitoring and Evaluation- Yakima / Klickitat Fisheries Project (YKFP)	YN	64
Yes	Integrated Status and Effectiveness Monitoring Program (ISEMP)	NOAA	47
Yes	Nez Perce Tribal Hatchery Monitoring and Evaluation (M&E)	NPT	26
Yes	Smolt Monitoring by Non-Federal Entities	FPC, PSMFC	26
Yes	Survival Estimate for Passage through Snake and Columbia River Dams and Reservoirs	NOAA	24
Yes	Columbia Basin Pit-Tag Information	PSMFC	23
Yes	Ocean Survival Of Salmonids	NOAA	22
No	Hungry Horse Mitigation Habitat Restoration and Research, Monitoring and Evaluation (RM&E)	MFWP	21
Yes	Columbia Habitat and Monitoring Program - Pilot (CHaMP-P)	NOAA	19
No	Evaluate Sturgeon Populations in the Lower Columbia River	ODFW	17
No	WA Estuary MOA Project Scoping & Implementation	WDFW	16
Yes	Comparative Survival Study (CSS)	FPC, PSMFC, USFWS	16
Yes	Klickitat River Monitoring and Evaluation- Yakima / Klickitat Fisheries Project (YKFP)	YN	16
No	Lake Roosevelt Data Collection	ST	16
Yes	Okanogan Basin Monitoring & Evaluation Program (OBMEP)	CCT	15
Yes	Grande Ronde Early Life History of Spring Chinook and Steelhead	ODFW	14
Yes	Kelt Reconditioning and Reproductive Success Evaluation Research	CRITFC	13
Yes	Snake River Fall Chinook Salmon Life History Investigations	PNNL, UW, USFWS, USGS	13
Yes	Idaho Natural Production Monitoring and Evaluation (M&E)	IDFG	12
Yes	Lower Columbia River Estuary Ecosystem Monitoring	LCEP	12
Yes	Escapement and Productivity of Spring Chinook and Steelhead	ODFW	11
No	Chief Joseph Kokanee Enhancement	CCT	11
Yes	New Marking and Monitoring Technologies	NOAA	11
Yes	Snake River Sockeye Captive Propagation	IDFG	11

Current RM&E reporting is inadequate for adaptive management

Independent Scientific Advisory Board (2016):

"Many reports appear to have been a bureaucratic afterthought and seem to reflect disregard for the adaptive management value of annual reporting. Consequently, without improvement, it will be difficult for the ISRP to base a scientific evaluation of the Program's effectiveness on annual reports."

"There is a general lack of data evaluation and results reporting."

"There is very limited documentation of how findings are applied to adjust or improve future restoration work (location, design and/or implementation). This lack of applying RME findings to future project work appears strongly related to the general lack of quantitative objectives with a time frame for expected results, which would serve as a foundation or reference for comparing predicted versus actual results."

"Reporting was behind schedule for a large number of projects in that an annual report for 2014 was not available at the time of our review in 2015. A small subset of projects had not submitted annual reports for several years…."

Source: *Critical Uncertainties for the Columbia River Basin Fish and Wildlife Program,* ISAB/ISRP 2016-1, Appendix D, pages 17-18.

Reporting has been addressed in Fish and Wildlife Programs since 2000

2014

"Bonneville should require all research, monitoring, and evaluation projects, including hatchery programs, to report annually, providing an electronic summary of their results and interim findings, as well as the benefits to fish and wildlife." p. 105

2009

"The revised Program … increases requirements for reporting of results and accountability; emphasizes adaptive management as a way to solve continuing uncertainties." p. 5.

"Reporting requirements must be included in the Bonneville contracts, and must include reporting in terms of performance metrics required by the Council." p. 91

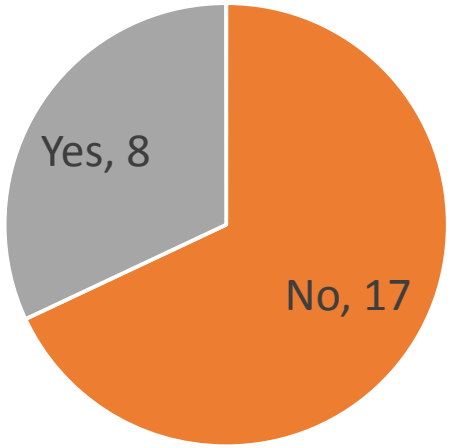
2000

"The 2000 Fish and Wildlife Program describes a general approach regarding research related to the Program, including…a call to make research results and other information important to the program more readily available." p. 28

Reporting 2016: Low compliance among the largest RM&E projects (as of May 2016)

Used the New Template by June 2016

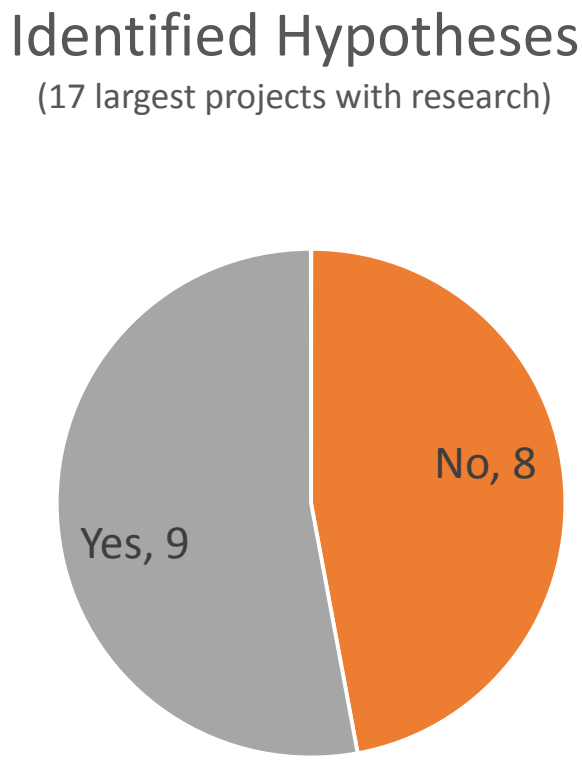
(25 largest RM&E projects)



"What is changing with BPA reporting?
….RM&E annual reports for contracts beginning on or after October 1st, 2014 will follow a new RM&E reporting template."
From BPA guidance document.

"Bonneville should continue working with the Council to implement a concise, useful template for annual reports for research and monitoring projects that can replace other more cumbersome, more costly, and less useful reports for individual projects."
From the 2014 Fish and Wildlife Program (p.106)

Reporting 2016: Many research projects don't state hypotheses and uncertainties (as of May 2016)



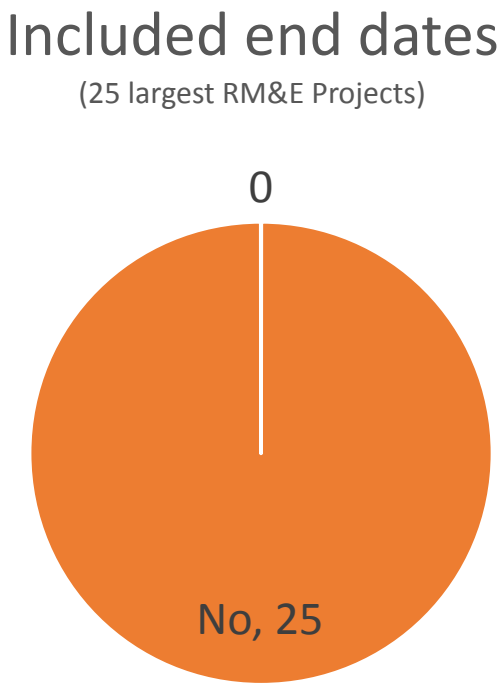
"For research projects and action effectiveness projects, include hypotheses, related uncertainties, and a timeline for your study including the start and anticipated end date."

Bonneville RM&E Reporting Template

"A high priority is to separate research reports from monitoring reports. The former should address hypotheses and critical uncertainties and the latter should provide important data about implementation, status, and trends."

2014 Fish and Wildlife Program, p. 105-6

Reporting 2016: Many RM&E projects don't report end dates (as of May 2016)



"For research projects and action effectiveness projects, include hypotheses, related uncertainties, and a timeline for your study including the start and anticipated end date." **Bonneville RM&E Reporting Template**

"Bonneville should ensure that all contracts for research projects, including those covered by funding agreements, identify an end date."
2014 Fish and Wildlife Program, p. 104

And yet,… over $9 million is budgeted in F&W Projects to provide reports

Work Element Description	FY 16 Expenditures	FY 15 Expenditures
Work Element: 132 - Produce (Annual) Progress Report	$4,789,334	$4,969,545
Work Element: 183 - Produce Journal Article	$725,677	$853,332
Work Element: 141 - Produce Other Report	$1,246,372	$1,207,262
Work Element: 185 - Produce Pisces Status Report	$1,929,878	$1,425,327
Work Element: 202 - Produce BiOp RPA Report	$706,177	$278,621
TOTAL	$9,397,438	$8,734,087

Source: PISCES

Conclusion:

Research reporting must improve if it is to be used for adaptive management.

Next Steps

1. Work with BPA to improve compliance.
2. Encourage BPA to issue separate research contracts and separate research and monitoring work elements.
3. Rely on combined RM&E budget data until reports can separate out research.

How do we set budget priorities? By Theme?

Fish propagation	35%
Tributary Habitat	17%
Hydrosystem flow and passage operations	13%
Monitoring and evaluation methods	12%
Population structure and diversity	11%
Harvest	4%
Mainstem habitat	3%
Estuary, plume, and ocean	3%
Predation	2%
Wildlife	1%
Climate change and human development	0%
	100%

2016, RM&E Priorities

Within themes?

1. Are current projects producing desirable environmental and biological results?
2. Identify future actions that may significantly improve biological results

By projects: Matrix criteria?

1. The information is critical and unknown
2. The project can provide that information
3. The cost of the project is appropriate.
   (Can the project use existing data?)