

Discussion Regarding the Development of Monitoring Metrics for the Goals and Objectives in § 1.4 of the LTEMP FEIS

Technical Work Group Meeting

January 25, 2018

AMWG Role - LTEMP ROD § 6.1.g

- Sub-bullet 2 of sub-bullet 2
 - AMWG will “advise...the Secretary...regarding...the implementation of resource management objectives, research studies, and environmental and cultural commitments...”
- Sub-bullet 3 of sub-bullet 2
 - AMWG will “review and provide input on the report [to Congress]...The report will include...status of resources...”
- Sub-bullet 4 of sub-bullet 2
 - AMWG will “...provide advice on the status of resources, whether the LTEMP FEIS goals and objectives are being met, and...”

Development of Monitoring Metrics

- LTEMP ROD § 6.1.c
 - “The DOI, in consultation with the AMWG, will develop monitoring metrics for the goals and objectives using those in Appendix C of the FEIS as a starting point.”
- TWG Operating Procedures
 - “Standing responsibilities of the TWG...is to consult with GCMRC in developing criteria and standards for monitoring and research programs...”

LTEMP Objectives (abridged)

- Develop an operating plan for GCD.
- Ensure LTEMP does not effect water deliveries.
- Consider GCD operational modifications and other actions to protect and improve resources.
- Maintain or increase GCD power while minimizing cost and emissions.

LTEMP Objectives (abridged)

- Respect tribal interests and perspectives.
- Make use of latest science.
- Determine the appropriate experimental framework.
- Ensure GCD operations and other actions are consistent with law.

LTEMP Resource Goals

- Archaeological and Cultural Resources
- Natural Processes
- Humpback Chub
- Hydropower and Energy
- Other Native Fish
- Recreational Experience
- Sediment
- Tribal Resources
- Rainbow Trout Fishery
- Nonnative Invasive Species
- Riparian Vegetation

Table 1. Summary of the 18 performance metrics used in the decision analysis.

[The range for each performance metric captures the amount of variability in the metric because of the effects of the different alternatives, the hydrological and sediment traces, and structural and parametric uncertainty. The range shown was used in the swing-weighting elicitation. HBC, humpback chub; RBT, rainbow trout; #, number; >, greater than]

Number	Resource goal	Performance metric	Units	Desired direction	Range
1	Humpback chub	Minimum number of adult HBC	# adults	Increase	3,000–8,500
2		HBC temperature suitability	Index (0–1)	Increase	0.0–0.2
3	RBT fishery	RBT catch rate	Fish/angler-hour	Increase	1.0–5.0
4		RBT emigration rate	Trout/year	Decrease	15,000–125,000
5		Abundance of high-quality RBT	# fish > 16 inches	Increase	400–1,200
6	Archaeological and cultural resources	Wind transport of sediment index	Index (0–1)	Increase	0.0–0.5
7		Glen Canyon flow index	Days/year	Decrease	0–75
8		Time-off-river index	Index (0–1)	Increase	0.60–0.95
9	Hydropower and energy	Hydropower generation	Million \$/year	Increase	120–200
10		Hydropower capacity	Million \$/year	Increase	10–50
11	Recreation	Camping area index	Index (0–1)	Increase	0.0–0.5
12		Fluctuation index	Index (0–1)	Increase	0.0–1.0
13		Rafting use index	Visitor-days/year	Decrease	0–1,300
14	Riparian vegetation	Riparian vegetation index	Sum of ratios	Increase	2.0–6.0
15	Sediment	Sand load index	Proportion (0–1)	Increase	0.0–0.6
16	Tribal resources	Marsh vegetation ratio	Ratio	Increase	0.0–1.5
17		Mechanical removal	Years (out of 20)	Decrease	0–5
18		Trout management flows	Years (out of 20)	Decrease	0–20
+	Other Native Fish	HBC temperature suitability			
+	Nonnative Invasive Species	Temperature suitability for warm-water and cold-water fish and parasites			
+	Natural Processes	Qualitative metric (no quantitative metric developed)			

Meet
2 needs
with
1 deed?

Need 1 = status of resources

Need 2 = are goals and objectives being met

2017 Knowledge Assessment

Table 8. Status and Trend Results by Resource

Resource Topic	Status & Trend
Aquatic Food Base	
Archaeological & Cultural Resources	
Humpback Chub	
Hydropower & Energy	
Invasive Fish Species	
Rainbow Trout	
Recreational Experience	
Riparian Vegetation	
Sediment	
Water Quality	

- Other Native Fish
- Tribal Resources









Status and Trend Symbol Set

Resource Status		Trend in Status		Confidence in Status & Trend Assessments	
	Resource is in Good Condition		Condition is Improving		High
	Condition Warrants Moderate Concern		Condition is Unchanging		Medium
	Condition Warrants Significant Concern		Condition is Deteriorating		Low
	Status Unknown	Trend Unknown	(n/a)	

Drivers and Constraints AND LTEMP Experimental and Management Actions Symbol Set

Strength of Effect		Direction of Effect		Confidence in Strength & Direction Assessments	
	Strong Effect		Positive (Beneficial) Effect		High
	Moderate Effect		No Effect		Medium
	Weak Effect		Negative (Detrimental) Effect		Low
	Strength of Effect Unknown	Direction of Effect Unknown	(n/a)	

HYDROPOWER & ENERGY

Resource Characteristics	Resource Characteristic	(No. of specific measures)	Resource Topic
Electric generation (capacity)		2	
Electric generation (energy production)		1	
Electric generation (energy value)		1	
Emissions		1	
Hydro-mechanical equipment		1	
Load following capability		1	
Net firming purchases		1	

Example of Specific Measure

- MWh generated/year

Next Steps

- TWG member outreach to your AMWG representative.
- Reclamation to develop process to complete.