

TRRP

Objectives ↔ Targets
Refinement

Long Process

- Focus coming out of the Phase I Review, TMC Meeting April 2013
- TRRP Objectives Workshop May 2013
 - Action Items:
 1. Reduce redundancies among means objectives
 2. Review the Conceptual Models Report to identify any missing objectives
 3. Identify linkages between objectives and management actions
 4. Develop quantitative metrics for each objective
- Goal / Fundamental Obj. / Means Obj. / Targets (metrics)

Challenges

- Volume of objectives in the IAP
- Common Language
- Perception that they need to be perfect to be useful
- WG coordinators report member fatigue around this task
 - I really appreciate the work and support of WG coordinators during the last ~ 7 months.
 - A lot of progress has been made!



Why?



Reframing this refinement

- These objective <-> target definitions should be living items
 - Attempting to get them perfect should not prevent us from using them to learn
- Reduce the number of objectives
 - Prioritize and complete objective <-> target definitions
 - We don't need to finish them all before we can start using them to learn
- Don't let "it depends" prevent learning
 - Talk about scope, scale, trend vs. threshold, etc.



Goals

- Reduce the number of objectives, and at least narrow the focus of those actively being worked on
- Create a starting point in the process by asking questions
- Develop targets that can be reevaluated in the future (living items)



Today's Presentation

- Demonstration of progress
- Practice
- Lessons learned
- Not
 - Debate on the objectives or targets as currently specified
 - Engage your WG members with those concerns



Step 1: Reduce and Combine

WGs worked to remove redundancies or remove objectives of active attention

Objective reduction examples

- Means objective: Increase naturally produced green sturgeon (same for Pacific lamprey) adult production to the extent necessary to meet or exceed escapement objectives and facilitate expanded harvest opportunity.
 - “Not quantified to measure program success” – no target defined
 - Does this mean the outcomes aren’t important – NO!
 - But ...
 - Do we currently perform the monitoring to assess a target for this objective?
 - Do we currently evaluate TRRP success via assessments of these species?

Objective reduction examples

- Limit redd superimposition by increasing suitable spawning habitat areas
 - No monitoring in place to formulate a target and assess (relatively low priority for WG members)
- Minimize fry stranding
 - No monitoring to evaluate, and ramp rates already protective enough

Objective combination examples

- Reduced due to combining
 - Minimize competition by hatchery smolts with wild fry and juveniles
 - Minimize predation by hatchery smolts with wild fry and juveniles
- Ta-da!
 - Minimize competition and predation by hatchery smolts with wild fry and juveniles

Step 2: Refine and Assess/Evaluate

WGs worked to create targets to assess progress towards meeting objectives, and use adaptive management principles to self-evaluate

Flow Work Group

Means Objective:

Release allocated flow volumes by water year class and implement prescribed hydrographs

Flow workgroup

- Cut-and-dry example of compliance
- Single objective and target

Release allocated flow volumes by water year class and implement prescribed hydrographs

- Extremely Wet WY 815.2k AF
- Wet WY 701.0k AF
- Normal WY 646.9k AF
- Dry WY 452.6k AF
- Critically Dry WY 368.6k AF

Flow release volumes by water-year class should be released from Lewiston dam to within $\pm 5\%$ of the allocated volume. Sub-daily flows should be implemented to within $\pm 5\%$.

Very compliant

WY	Flow allocation	Flow released to Trinity River	Percent of allocation released
2004	646,900	651,000	101%
2005	646,900	647,600	100%
2006	815,200	809,900	99%
2007	452,600	453,700	100%
2008	646,900	648,700	100%
2009	452,600	445,500	98%
2010	646,900	656,700	102%
2011	701,000	721,800	103%
2012	646,900	647,100	100%
2013	452,600	451,900	100%
2014	368,600	370,500	101%
2015	452,600	450,700	100%
2016	701,000	708,800	101%
2017	815,200	821,266	101%
2018	368,600	377,072	102%

Percent of years within +/- 5%: 100%

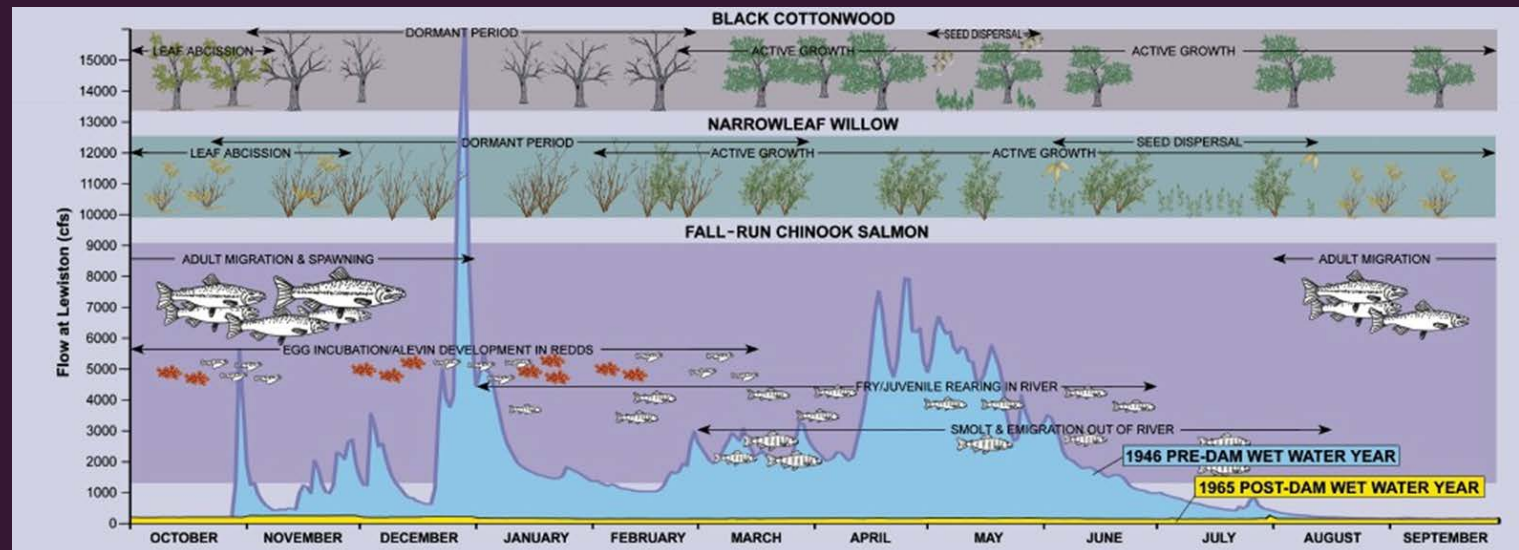
The Riparian and Aquatic Ecology Workgroup (RAE)

Means Objective:

Increase the width of the aquatic-terrestrial interface

Objective for RAE-1

- Increase the width of the aquatic-terrestrial interface
 - Focus on the riparian zone
 - The area where both aquatic attributes (such as periodic inundation) and terrestrial attributes (such as trees/veg) may be found
 - Increasing a-q width is associated with an increase of numerous characteristics identified as important for achieving fundamental TRRP objectives



Target for RAE-1

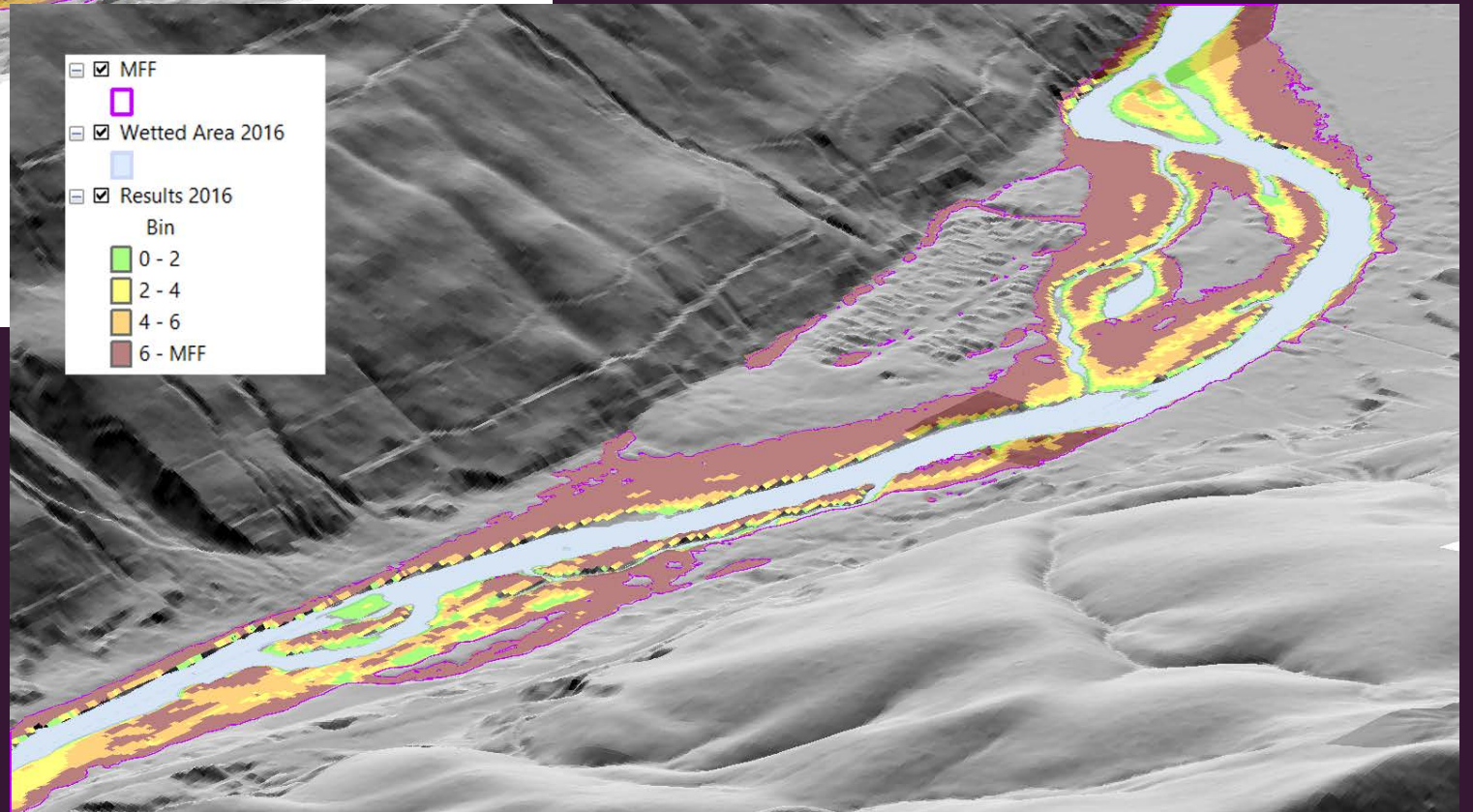
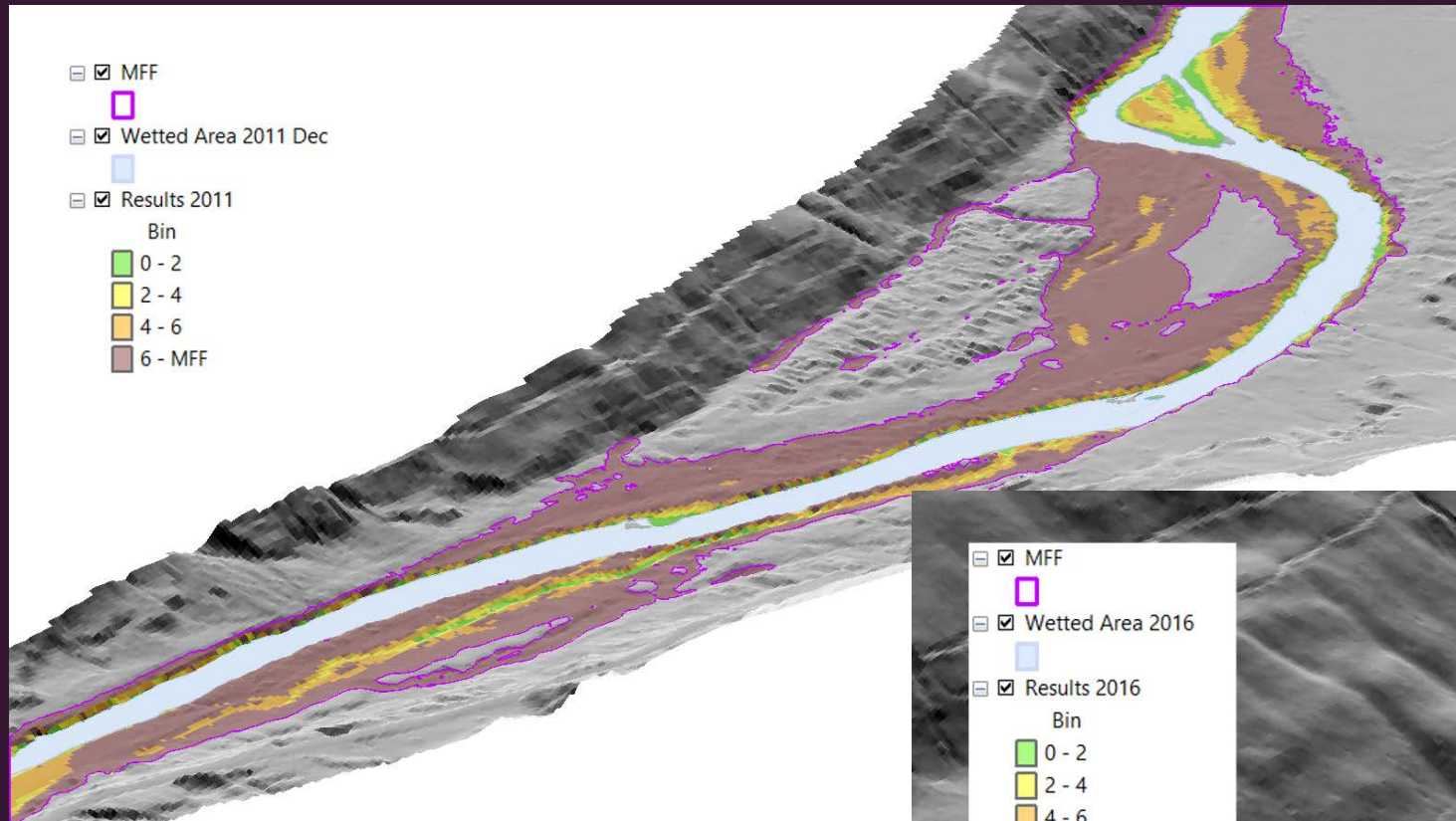
- Percent of MFF (maximum fishery flow) area that is ≤ 6 feet above the water surface elevation in the adjacent channel
- Why?
 - Benefits black cottonwood recruitment
 - Off-channel areas accessible to rearing salmonids during high flows
 - Maintenance of wetlands
 - 6 ft is literature based and verified with our field data



Percentage of low ground in the MFF at the 40 mile scale

HAR (ft)	2009	2011	2016	Improvement (2009-2016)
< 0	29.97%	29.67%	30.65%	0.68%
0-2	11.00%	10.21%	11.26%	0.26%
2-4	14.27%	13.21%	14.49%	0.22%
4-6	18.28%	18.54%	18.35%	0.07%
0-6 (subtotal)	43.55%	41.96%	44.10%	0.55%
< 6 (total)	73.52%	71.63%	74.75%	1.23%

Lorenz Gulch



Percentage of low ground in the MFF Lorenz Gulch (constructed in 2013)

HAR (ft)	2011	2016	Improvement (2011-2016)
< 0	26.90%	31.18%	4.28%
LT 2	5.29%	10.69%	5.40%
2 to 4	5.86%	11.80%	5.94%
4 to 6	11.83%	16.60%	4.77%
0-6 (subtotal)	22.98%	39.09%	16.11%
< 6 (total)	49.88%	70.27%	20.39%

Analysis of target

- The practice of making an assessment allowed us to refine the appropriate spatial scale
 - TRRP not making physical changes to 40 miles of aquatic-terrestrial interface
 - New target focusing on site showed a meaningful change
 - Is additional assessment of target needed?

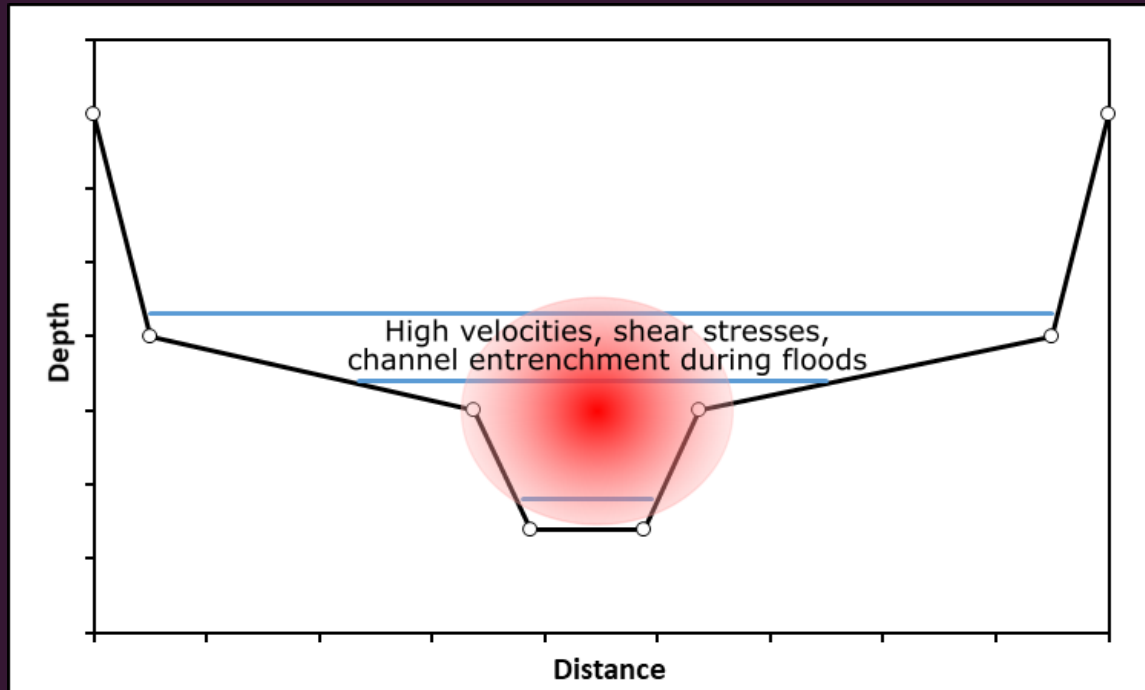


Physical Workgroup

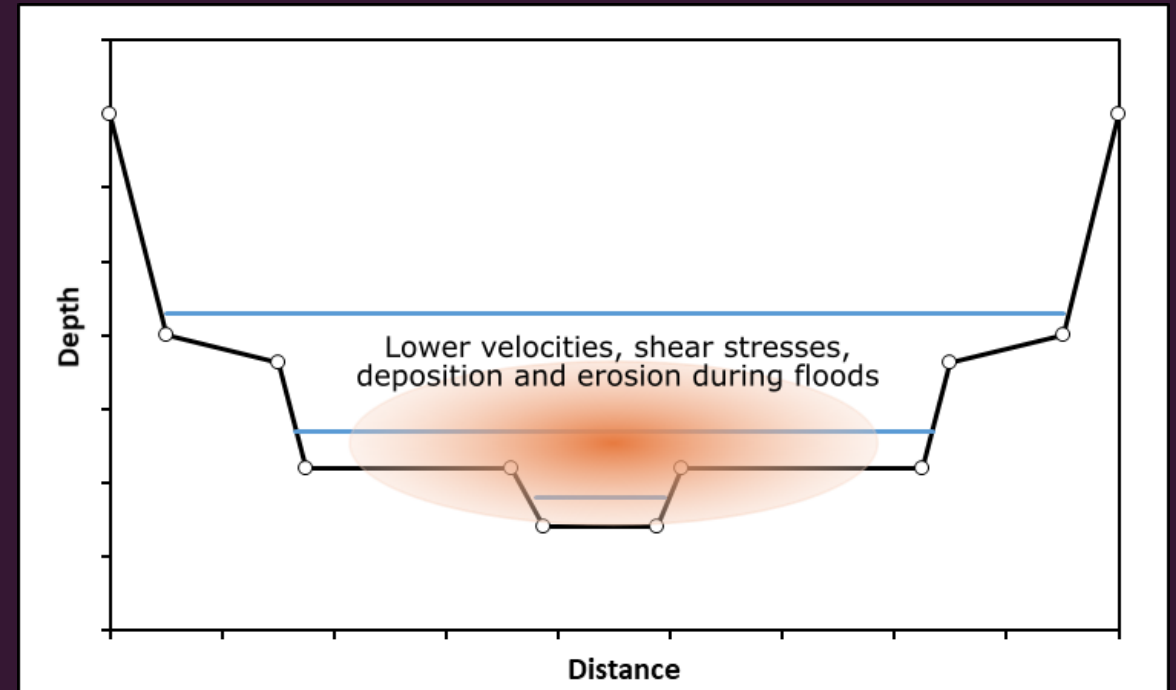
Means Objectives:

Focus on measures of channel complexity and process

Means objective: Increase the valley wetted area (W_a)
 $W_a = \text{Wetted Area} / \text{Valley Floor Area}$



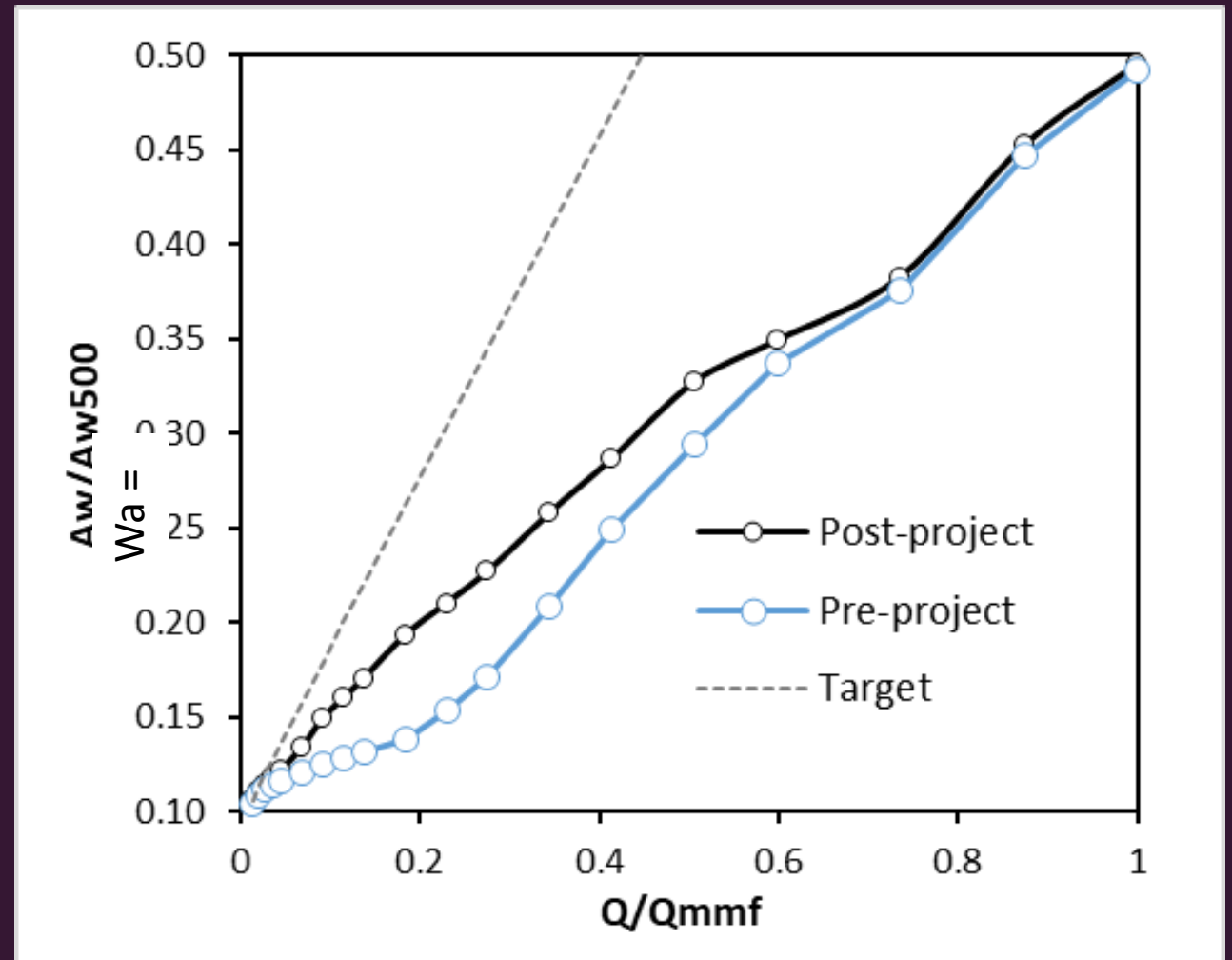
Lower W_a :
Flow Concentrated to Narrow Portion of Valley Floor



Higher W_a :
Flow Occupies Larger Portion of Valley Floor

Wa Applied to Evaluate/Assess Restoration Actions: Sheridan and Deep Gulch

- Wa Evaluated over Study Reach
- Wa Integrated over discharges up to the maximum fisheries flow (Q_{mmf})
- **Designs evaluated** on basis of increasing Wa over range of flows
- **Projects assessed** on basis of increasing Wa over range of flows



Means objective: Increase active bar area

- Defined as active fluvial gravel deposits above 450 cfs
- Measure of coarse sediment storage
- Increases channel and hydraulic complexity, promotes lateral channel dynamics, increases rearing and spawning habitat



Active Bar Area Status:

Visual Observations in 1989:

- Few Active Gravel Bars

Field Mapping in 2014

Qualitative Assessment:

- Increase in bars over 1989-2014

Repeat of 2014 Survey:

- 2-person crew 2 weeks of field mapping



Active Bar Area Status:

- Asking the question forced us to cobble-up (pun intended) some data to make an assessment of the target, but
 - Highlights that a more formal and complete monitoring effort is needed to fully assess the target
 - Ground surveys, aerial photos, data collected ancillary to other current surveys, etc.



Physical Workgroup Take-aways

- Identifying trend targets relatively easy, but thresholds or “We’ve done it!” type target values remain elusive for their objectives
- Tension between optimizing single targets vs. balancing among multiple targets



Fish Workgroup

Means Objectives regarding harvest and water temperatures

Fish workgroup

- Means objective: Increase naturally produced fall-run Chinook salmon adult production to the extent necessary to meet or exceed escapement objectives and facilitate expanded harvest opportunity



Harvest objective

- TRRP has embraced annual returns of 62,000 naturally produced and 9,000 hatchery produced adult fall Chinook
 - After exposure to marine and in-river fisheries
- Pacific Fishery Management Council (PFMC) also manages these fisheries
- Concern of lack of compatibility between PFMC control rules and TRRP goals for naturally produced fish (except at very high stock sizes)

Harvest objective <-> target

- How to define a target for production to result the escapement goals?
 - Complicated formula involving natural and hatchery harvest goals, marine harvest, in-river harvest below the Trinity, and assumptions about PFMC management and regulation, and original of natural area spawners
- 131,750 naturally produced adults contributing to these fisheries

Assessing the target

- We have estimates of some components quickly available
- But assessing this target requires a cohort reconstruction
 - Which is in the works

Year	N-O adult harvest
2002	295
2003	322
2004	0
2005	247
2006	0
2007	552
2008	138
2009	330
2010	99
2011	327
2012	1644
2013	498
2014	276
2015	17
2016	26
2017	0
2018	293

Harvest objective <-> target take-aways

- When it came down to it: very complicated to formulate, and then calculate, the actual target
 - Something not fully understood until the exercise of sitting down to complete this process
- Success - on quantitative target formulation (not even a trend!)
 - The process of creating and assessing the target highlights the need for more information than is readily available

Temperature targets

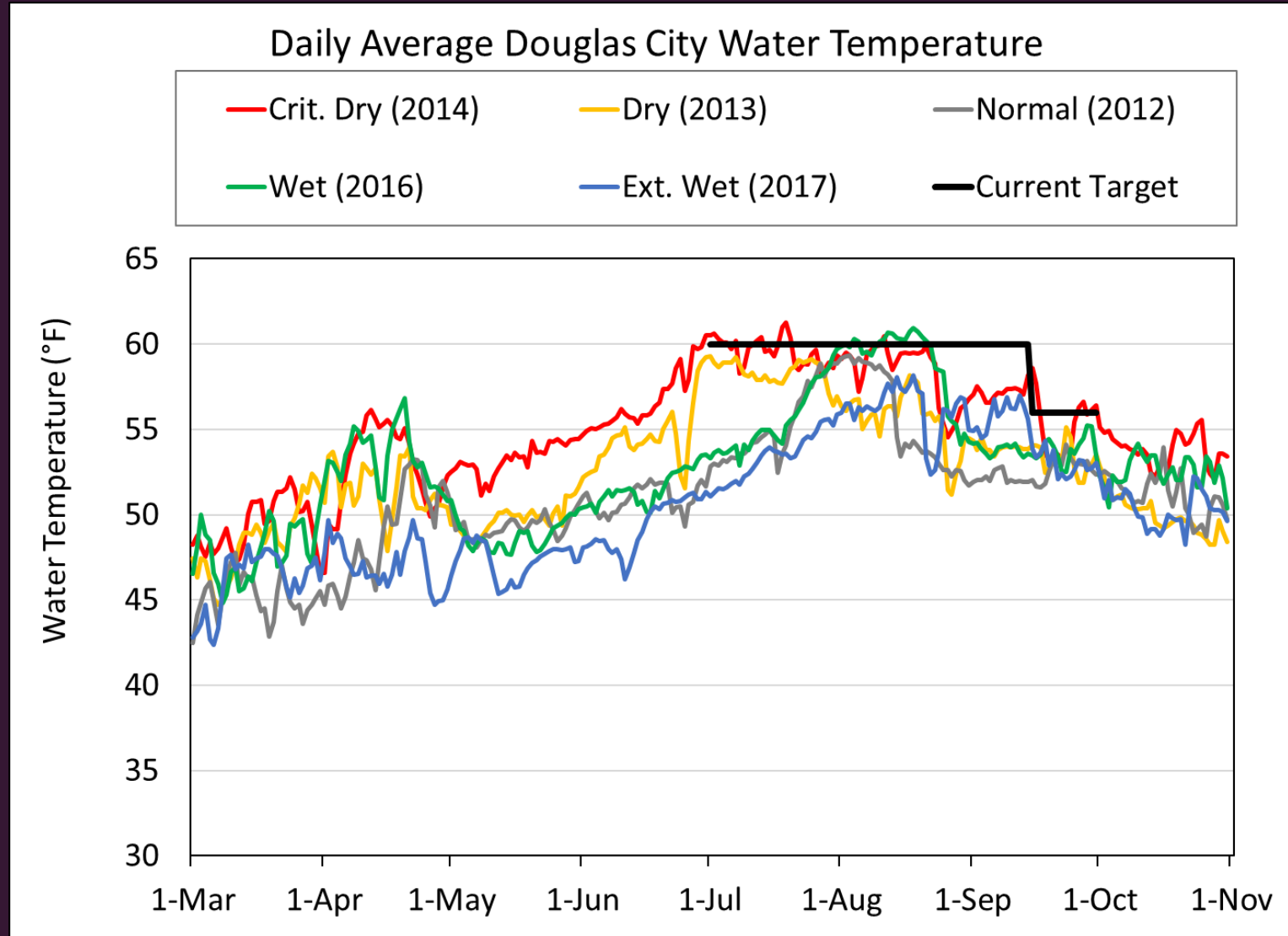
Date	Temperature Objective (°F)		Regulatory Agencies
	Douglas City (RM 93.8)	North Fork Trinity River (RM 72.4)	
July 1 through Sept 14	60	-	NCRWQCB, NMFS
Sept 15 through Sept 30	56	-	NCRWQCB, NMFS, SWRCB
Oct 1 through Dec 31	-	56	NCRWQCB, NMFS, SWRCB

Temperature targets

- Developed for adult salmonids
- Constrained by legal requirements for Sacramento River
- The objectives also stipulate that water released into the Trinity River may be no more than 5°F warmer than receiving water temperatures



Again, very compliant



Daily Average Douglas City Water Temperature

