Draft Proposed Shasta Reasonable and Prudent Alternative Amendment overview

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Shasta RPA amendment workshop #4

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Background

- 2011 amended RPA provides for adaptive management
- NMFS perspective on why an adjustment/adaptive management is needed:
  - Recent multiple years of drought conditions
  - New science and modeling
  - Data demonstrating low population levels of winter-run and spring-run
  - Potential for increased flexibility & predictability

Background (cont'd)

- Purposes as defined by NMFS:
  - Sets interim operational changes that are necessary at this time
  - Phased approach, provides a bridge between current RPA and completion of the reinitiation of consultation (estimated at 3-5 years)

Framing the Temperature Management Season

- Seasonal planning in the current RPA:
  - February forecast
  - Summer temperature management
  - Fall storage/conservation

Draft Proposed Shasta RPA Amendment

Feature	2011 RPA Amendment	Draft Proposed RPA Amendment	WY 2017 Operation Study
RPA Action I.2.1	Performance Measures:	Objective-Based Management:	*N/A*
	N/A	Australian Model	*N/A*
	N/A	Temp-dependent mortality objectives	*N/A*
	N/A	Peak spring storage targets	*N/A*
	10-year avg % met	End of September storage targets	*N/A*
	10-year avg temperature compliance point (TCP) % met	N/A	*N/A*

Draft Proposed Shasta RPA Amendment

Feature	2011 RPA Amendment	Draft Proposed RPA Amendment	WY 2017 Operation Study
RPA Action I.2.3: Initial forecast	"…sufficient water for temperature management…"	Peak spring storage targets based on water year type	N/A
Adult winter-run migration and holding	56°F DAT btn Balls Ferry and Bend Bridge 4/15-5/15	61°F 7-day average daily maximum temperature (7DADM) at Jellys Ferry 3/1-5/15	N/A
RPA Action I.2.3.A: temp and storage met	Initial allocation	Initial allocation	N/A
RPA Action I.2.3.B: temp and storage not achievable	Coordinate and consult	Monthly Keswick release schedule by water year type	N/A
RPA Action I.2.3.C: drought exception procedure	Temp/TCP and EOS not achievable	Temp/TCP and EOS not achievable	N/A

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Feature	2011 RPA Amendment	Draft Proposed RPA Amendment	WY 2017 Operation Study
RPA Action I.2.4:			
Temperature Compliance Location	Between Balls Ferry and Bend Bridge	Clear Creek CDEC gage (CCR)	Clear Creek CDEC gage (CCR)
Temperature metric	Daily average temperature (DAT)	7DADM or DAT surrogate	DAT surrogate
Temperature criterion	≤56°F DAT	≤53.0°F to ≤56.0°F DAT, depending on yeartype	≤53.0°F DAT (Wet year target)
RPA Action I.2.4.1: Post season winter-run egg-to-fry survival evaluation	N/A	% based on water year type	

Australian Model Framework

Examples of environmental watering objectives under different planning scenarios

SOURCE: Victorian Environmental Water Holder, 2015. Seasonal Watering Plan 2015-16: Introduction.

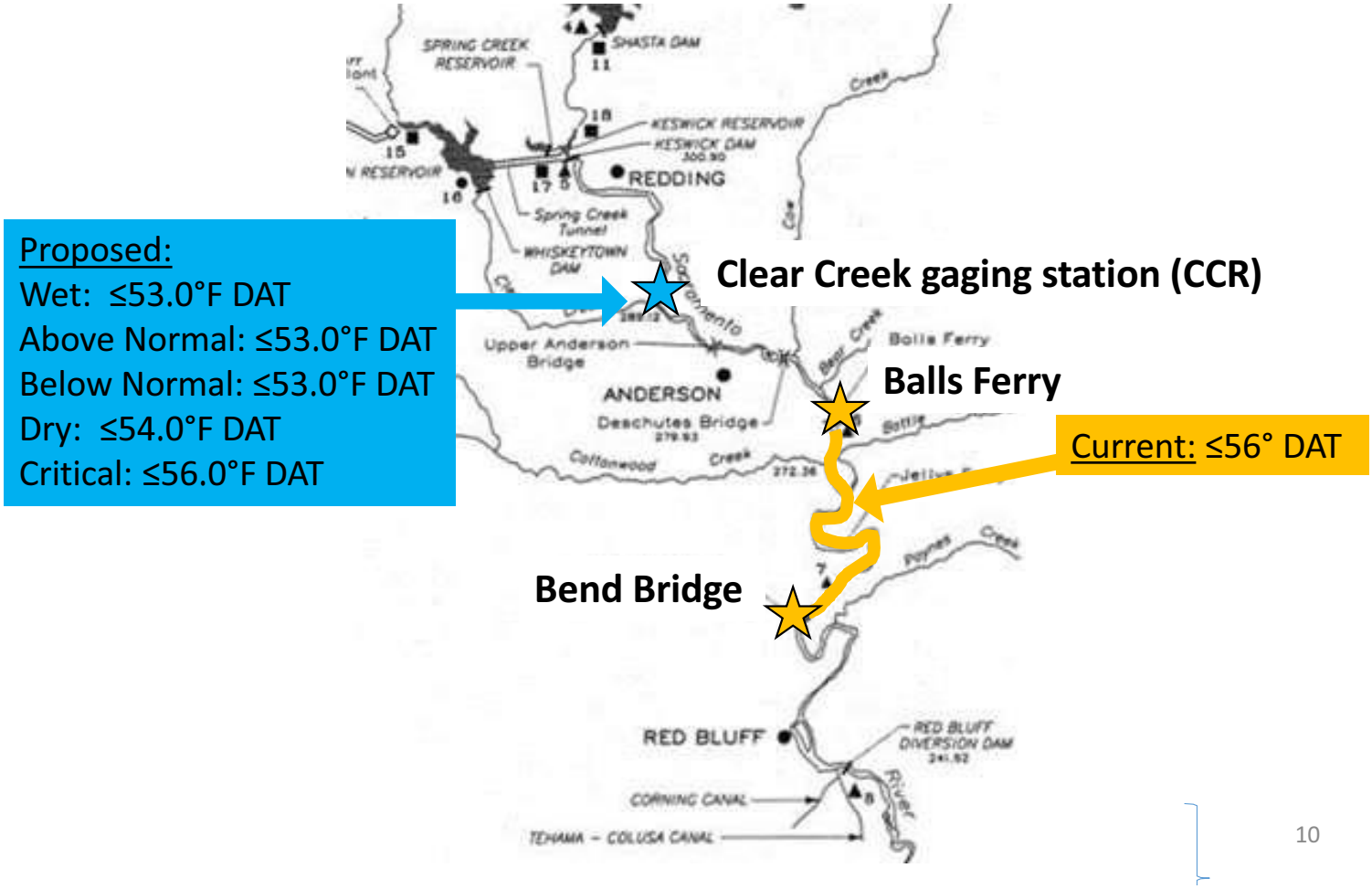
NOTE: The Seasonal Watering Plan sets objectives based on the amount of precipitation and the amount in storage. This allows for changing priorities that match changes in conditions.

From Mount et al. 2016: Managing Water for the Environment During Drought

Australian Model Framework

	CRITICAL	DRY	BELOW NORMAL	ABOVE NORMAL & WET
Objective	PROTECT	MAINTAIN	RECOVER	ENHANCE
Temperature-dependent mortality objective	<30%	<8%	<3%	<3%
Associated temperature criterion (at Clear Greek gage)	≤56°F DAT	≤54.0°F DAT	≤53.0°F DAT	≤53.0°F DAT

Map of Current and Proposed Temperature Compliance Point



Draft Proposed Shasta RPA Amendment Process

- January 2017: NMFS issued the draft
- March 2017: Reclamation issued formal response
  - Concerns on:
    - Feasibility
    - More restrictive operations
    - Science of new objectives
    - Applicability under adaptive management process as opposed to reconsultation
    - Other elements
- Agency interactions provided for plan to allow for analysis of draft proposal while also conducting an operational study given suitable hydrologic conditions in 2017

Draft Proposed Shasta RPA Amendment Process

- Structured stakeholder engagement process:
  - Workshop #1: seek input on the initial science and modeling workplan
  - Workshop #2: seek input on draft temperature pilot plan components and modeling
  - Workshop #3: review final 2017 temperature management pilot plan and status report on system-wide modeling
  - Workshop #3.5: update on science workplan and system-wide modeling
  - Workshop #4: seek input on science workplan, system-wide modeling results

Draft Proposed Shasta RPA Amendment Process

- System-wide modeling:
  - Focus of workshops #2 and 3
  - Evaluates operation of Shasta Reservoir and the CVP with the imposition of end-of-April and end-of-September storages, and required Keswick release schedules
  - Temperature and biological modeling currently underway

LOBO Review 2017

- Questions to the IRP associated with:
  - Temperature-dependent egg mortality model and critical temperature threshold
  - Application of the Australian model (Mount et al. 2016)
  - 7 DADM vs. DAT
- December 4-7, 2017, meeting
- January 25, 2018, letter from the Delta Science Program transmitting recommendations

Science and monitoring plan (transition slide)

- Purposes:
  - Identify near-term monitoring, modeling, and analysis and synthesis needs to improve fish and water management decision-making
  - Reduce uncertainty on the conditions necessary to achieve desired fish and water management goals
- Includes:
  - conceptual models of early life history stages of winter-run and potential stressors to those life stages
  - management questions to direct the necessary scientific studies to the most relevant issues for decision making

Next Steps/Involvement (move to the end)

- Draft Shasta RPA Amendment Workshop #4: date TBD
  - Objectives: seek input on science workplan, system-wide modeling results
- LOBO review: December 5-7, 2017
- NMFS/Reclamation decision in January on whether to extend the operational study to 2018
- February forecast