Status Update of the BDCP Effects Analysis for Fish Species and Aquatic Natural Communities

Bay Delta Conservation Plan

Steering Committee Meeting

November 5, 2009

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Outline

1. Previous work efforts - September-October
2. Current work efforts – early November
3. Future work - November-February
4. Future work - March-April

Acronyms for Evaluation Points

NT = Near Term
ELT = Early Long Term
LLT = Late Long Term

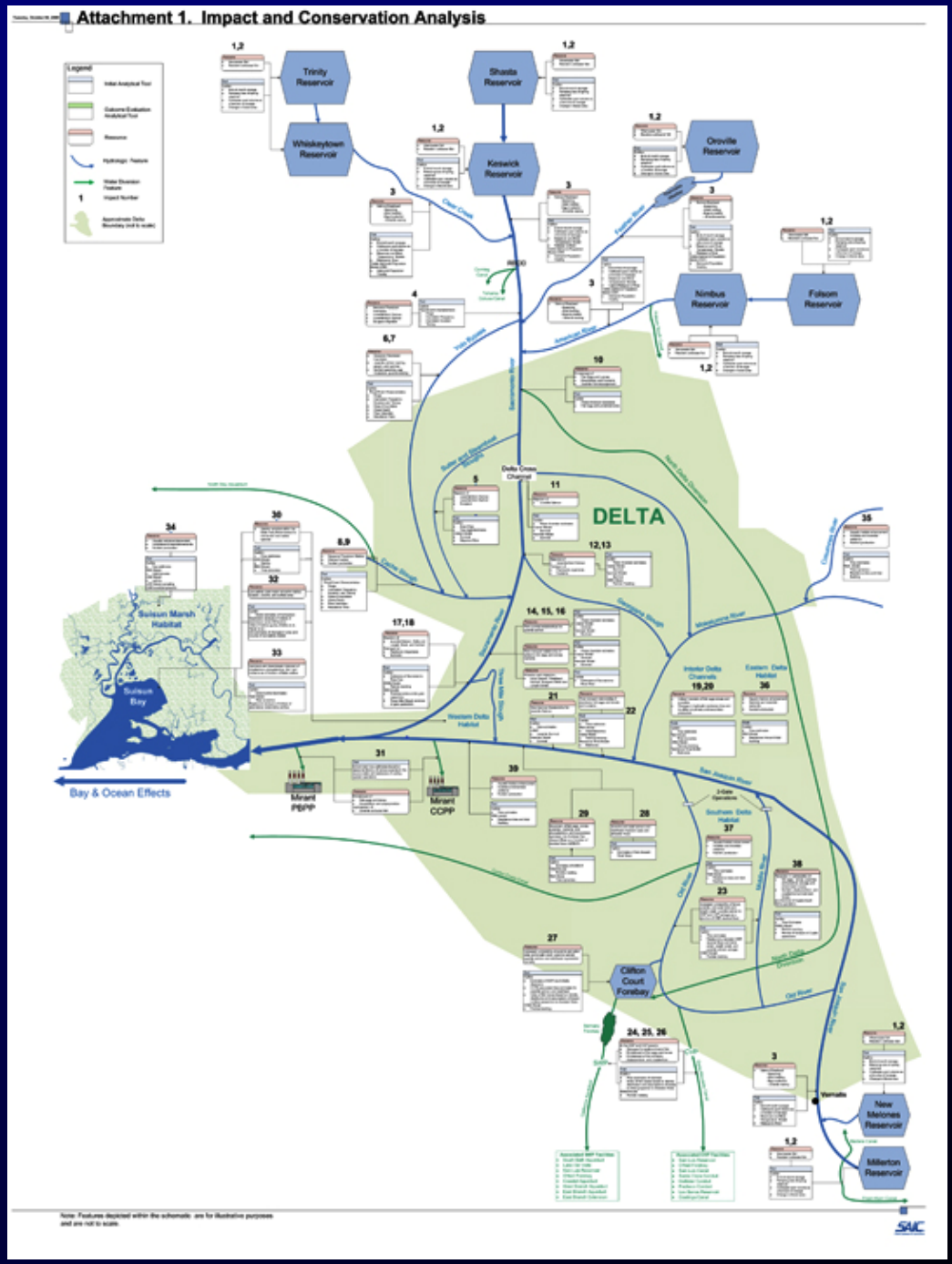
1. Previous Work Efforts: Sept-Oct

- Technical Managers meetings
- Subgroup meetings
- Preliminary hydrologic modeling output for ELT (SC Sept 10)
- Proposed near term operations (SC Sept 17)
- Approach & Workplan development (SC Oct 8)
- Incorporation of tidal habitat restoration into hydrodynamic models – NT, ELT, LLT
- Modeling of future tidal conditions in restoration areas without climate change (RMA 2D model)

Subgroups

- Physical Modeling
- Food Web
- Estuarine Fish
- Anadromous Fish
- Riverine Fish
- Reservoir Fish
- Ocean Species
- Wildlife and Plants
- Natural Communities

Graphical Form of Effects Analysis



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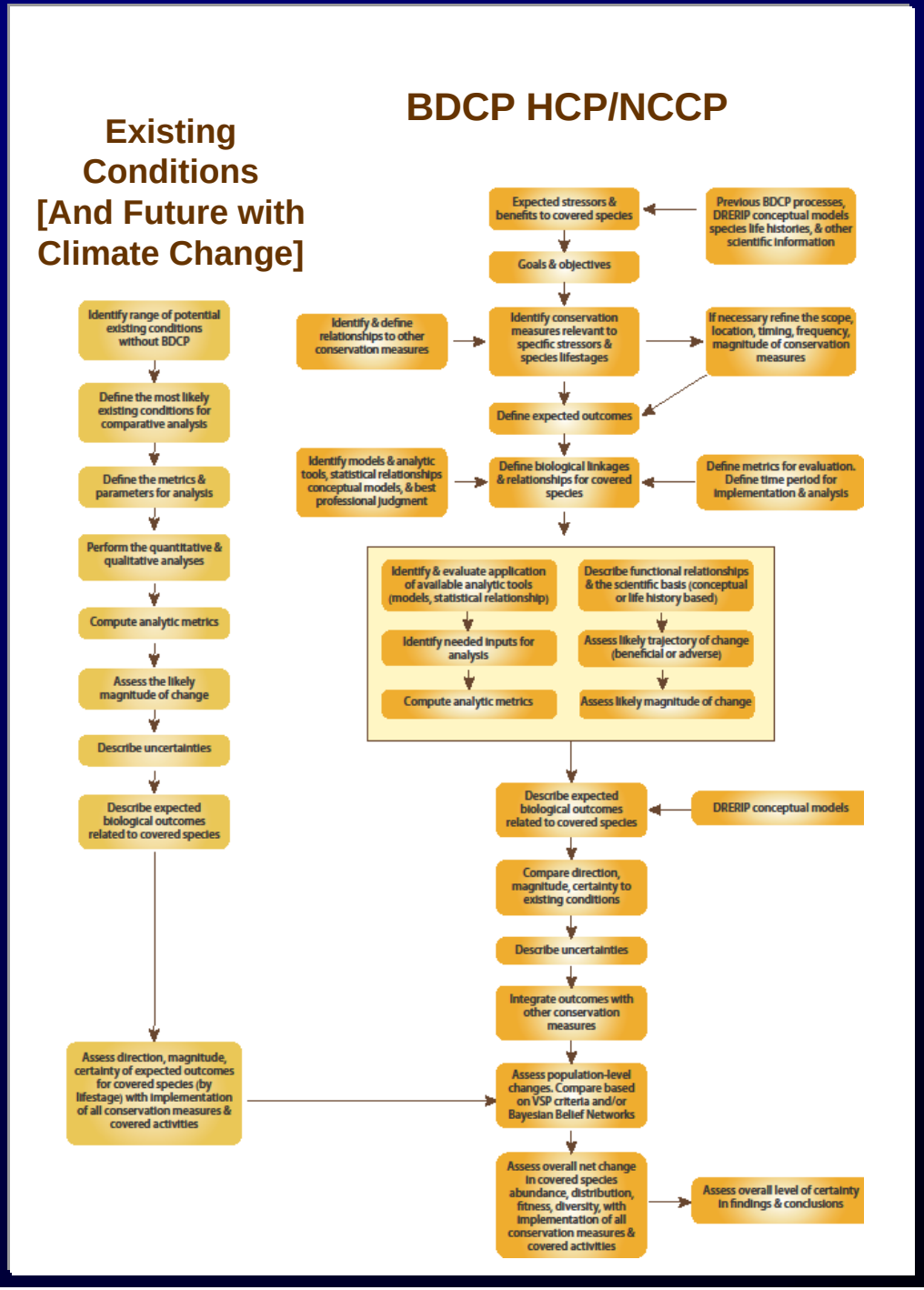
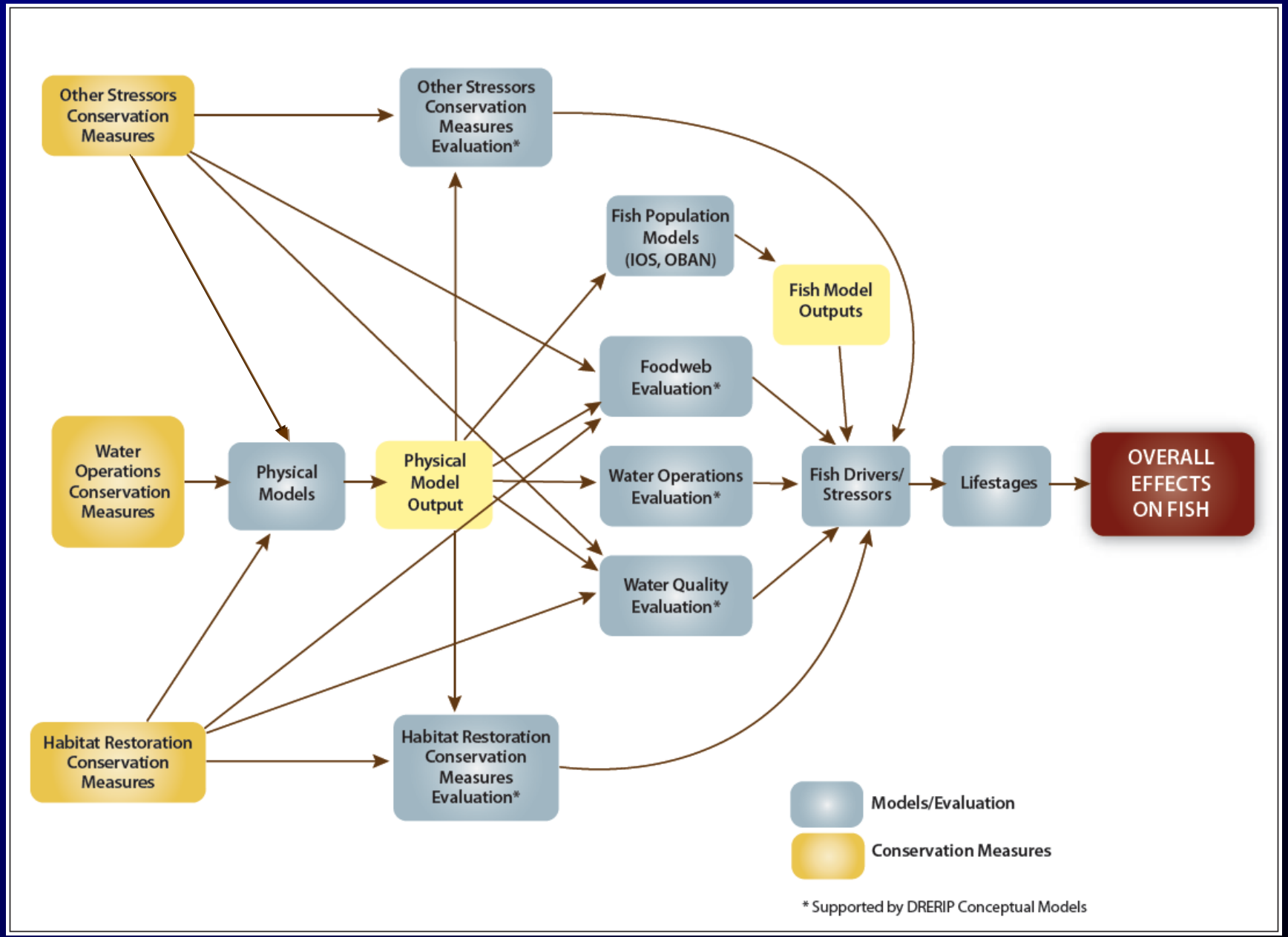
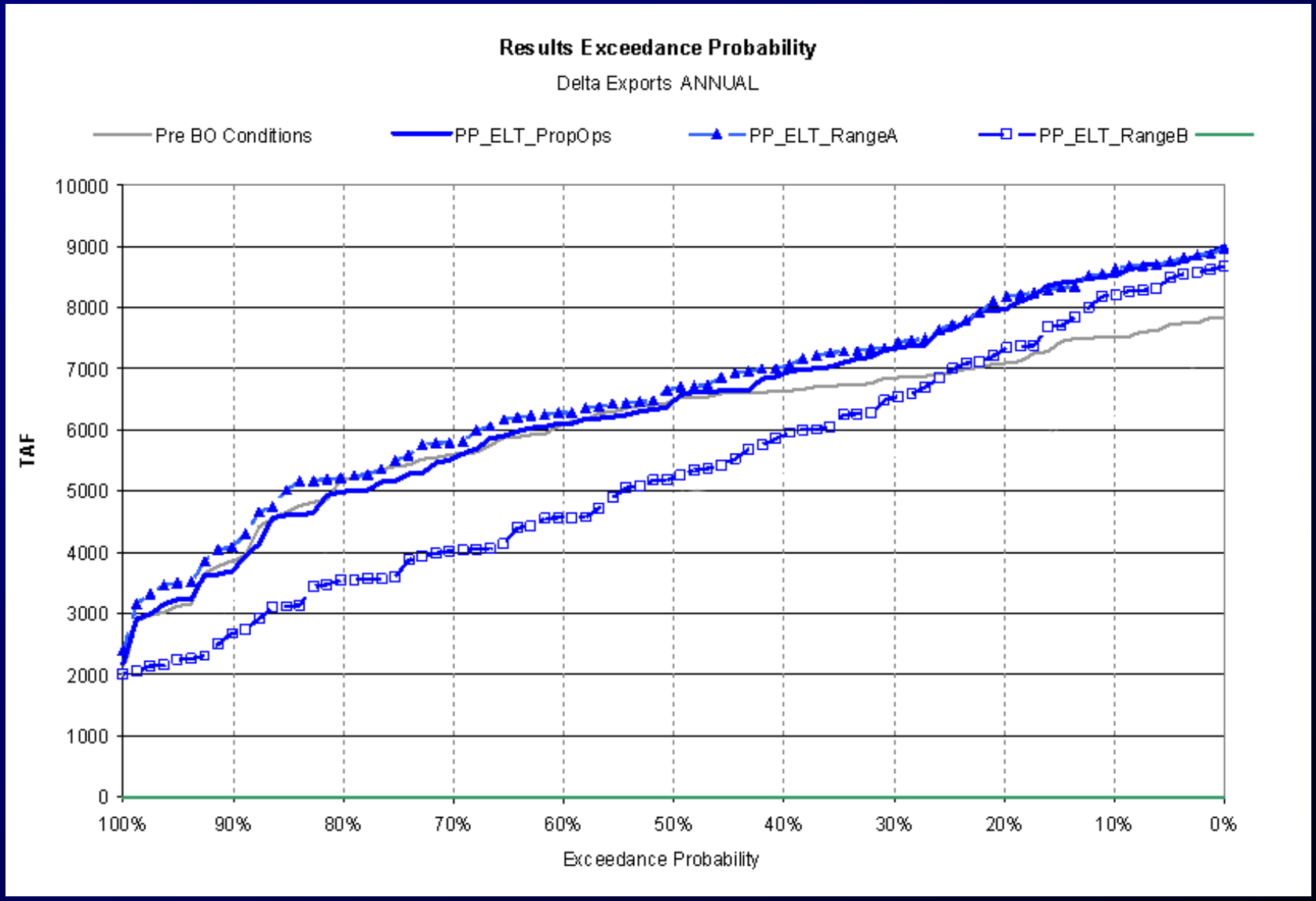
Overall Approach



Path from Conservation Measures to Fish Effects



Preliminary Physical Modeling Output



2. Current Work Efforts – early November

- Draft species workplans preparation
- Draft workplans distributed to technical subgroups this week and next week
- Developing specifics of overall framework
- Developing EIR/EIS biology workplans
- CALSIM and DSM2 model runs for NT, ELT (with tidal habitat restoration incorporated; without climate change)
- Approval of appropriate inputs to model RPAs
- Approval of approach to climate change analysis

Example: Sacramento River Chinook salmon egg/embryos

Sacramento River Basin Salmonids – Workplan Matrix
10/23/2009

Lifestage	PCEs addressed	Stressor/Driver and DRERIP magnitude	Impact mechanism of stressor/ driver	BDCP Actions potentially affecting stressors (positively and negatively)	Factor affected	Analyses/Tools/Methods	Outcome	Metric	Biological relationships/assumptions needed for analysis	DRERIP outcome of action	Major importance to species -- Anadromous fish subgroup	Comments
Eggs/embryos - upstream	Winter-2 Spring-1 Steelhead-1	Water Quality-Turbidity/ sedimentation	[Inhibition of spawning **or** mortality of eggs???	Water ops	Quantity of flow that scours sediment in spawning gravel	CalSim II to get exceedance curves in spawning reaches in all CVP/SWP rivers	Frequency of flows exceeding XX cfs	Analysis of flows within spawning reach	1. Frequency of high flow events related to scouring of gravel			
	Winter-3 Spring-1 Steelhead-1	Habitat Loss-Spawning	Inhibition of spawning	Water ops	Quantity of flow affecting availability of suitable habitat	CalSim II->PHABSIM for each CVP/SWP rivers	Change in weighted usable area for spawning	Sq meters of suitable habitat/meter of river	1. Habitat preference curves			
	Winter-4 Spring-1 Steelhead-1	Water temperatures	Direct mortality	Water ops	Temperature – dose response based on magnitude and duration of exposure	CalSim II -> USBR and DWR Temperature Models > SALMOD, USBR egg mortality model	Change in the mortality rate of incubating eggs; change in the area downstream that supports suitable habitat	Percentage egg mortality by species and river; distance downstream of dam where water temperature remains less than 56 F	1. Water temperature criterion for suitable egg incubation (56 F) 2. Relationship between temperature exposure, duration, and egg mortality used in the models			
	Winter-3 Spring-1 Steelhead-1	Redd dewatering	Direct mortality	Water ops	Rapid reduction in flow after spawning	CalSim II -> PHABSIM for each river or locally developed redd dewatering curves	Reduction in wetted cross-section and water depth with flow reduction	Wetted cross-section in feet, change in weighted usable area during egg incubation	1. Habitat preference curves 2. seasonal timing of egg incubation 3. relationship between flow and spawning area			
	Winter-2 Spring-1 Steelhead-1	Redd superimposition	Inhibition of spawning	Water ops	Availability of spawning habitat	CalSim II->PHABSIM for each river and water temperature -> Number of spawners*redd size/available spawning area	Change in wetted usable area (WUA) during spawning period, area where water temperatures are suitable for spawning	Sq meters of suitable habitat/meter of river, change in miles of river with suitable spawning temperatures	1. Relationship between WUA and superimposition			
				OSCM18 HGMPs	Genetic introgression of hatchery and wild stock	BPJ	Change in the likelihood of hybridization between hatchery and wild stocks		1. Effectiveness of actions in reducing hybridization between hatchery and wild stocks			

3. Future Work: November-February

- Preliminary results of physical modeling of NT & ELT without climate change - SC November 19
- Physical modeling of NT, ELT, and BO RPAs without climate change - SC December 3
- Modeling of future tidal conditions in restoration areas (RMA 2D model) - December
- Fish population models – early January
- Aquatic species analysis of NT and ELT without climate change – January
- Physical modeling of ELT, LLT, and No Action with climate change - February

Schedule of BDCP Effects Analysis Oct-Feb

	Task	16-Oct	23-Oct	30-Oct	6-Nov	13-Nov	20-Nov	27-Nov	4-Dec	11-Dec	18-Dec	25-Dec	1-Jan	8-Jan	15-Jan	22-Jan	29-Jan	5-Feb	12-Feb
Near-Term	Physical and Hydrologic Model Runs (without climate change)																		
	Aquatic Species Analysis																		
Early Long-Term	Physical and Hydrologic Model Runs (without climate change)																		
	Aquatic Species Analysis (without climate change)																		
	Climate Change Scenario Development																		
	Physical and Hydrologic Model Preparation (with climate change)																		
	Physical and Hydrologic Model Runs (with climate change)																		
	Aquatic Species Analysis (with climate change)																		
Late Long-Term	Climate Change Scenario Development																		
	Physical and Hydrologic Model Preparation with Climate Chage																		
	Physical and Hydrologic Model Runs - Future No Action																		
	Physical and Hydrologic Model Runs - Proposed Action																		
	Aquatic Species Analysis																		
Baseline	Decision of BO RPA Actions to Model																		
	Physical and Hydrologic Model Runs																		
	Aquatic Species Analysis																		
Terrestrial	Terrestrial Species GIS Evaluations (without climate change)																		
	Terrestrial Species Outcomes (without climate change)																		
	Cumulative Effects Analysis (without climate change)																		
	Terrestrial Species GIS Evaluations (with climate change)																		
	Terrestrial Species Outcomes (with climate change)																		
	Cumulative Effects Analysis (with climate change)																		
	Writing Tasks																		

4. Future Work: March-April

- Fish population models ELT & LLT with climate change - March
- Aquatic species analysis of ELT and LLT with climate change - March
- Draft Chapter 5 *Effects Analysis* and supporting technical appendices - April

Schedule of BDCP Effects Analysis – Feb-Apr

	Task	22-Jan	29-Jan	5-Feb	12-Feb	19-Feb	26-Feb	5-Mar	12-Mar	19-Mar	26-Mar	2-Apr	9-Apr	16-Apr	23-Apr	30-Apr
Near-Term	Physical and Hydrologic Model Runs (without climate change)															
	Aquatic Species Analysis															
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	Writing Tasks															

Questions & Comments