BDCP Steering Committee	**HANDOUT #2**
Initial Working Model Inputs	**Operational Parameters for Option 2**
July 18, 2007	

Conservation Strategy Option 2 - Existing SWP/CVP Diversion Facilities with an Eco-Crescent of Operable Barriers

Initial working model operational parameters for BDCP Option 2[1] - Below Normal Water Year.

Option 2 Summary: Operable physical channel barriers, siphons, and a hydraulic inter-tie would be constructed in the southern Delta to create flow corridors separating fish from pumping facilities in Old, Middle and San Joaquin Rivers. Restoration opportunities would include those identified in Option 1 plus additional opportunities in the central and south Delta. **Note:** need to add a gate at Franks Tract.

Parameter	Range		Rationale
Operational condition and seasonal time period used as a model input and/or output	*A range of values for a given operational condition intended to reflect alternative hypotheses or interpretations of available data*		*The rationales generally reflect the intended result of the parameter.*
Delta Salinity Standards	Manage to meet D-1641 agricultural water quality	Do not manage specifically to meet water quality standards – variable salinity	Meet water quality standards for CCWD (assumes CCWD diversions from Victoria Canal)
Sacramento River at Rio Vista			
Sept	3,000 cfs	4,500 cfs	Adult Chinook salmon attraction and migration flows
Oct	4,000 cfs	4,500 cfs	Adult Chinook salmon attraction and migration flows
Nov-Dec	4,500 cfs	4,500 cfs	Juvenile salmon and steelhead migration/survival, pre-spawning migration by delta smelt, splittail, and others
Jan	No criterion	4,500 cfs	Juvenile salmon and steelhead

[1] These operational parameters have been developed by the SAIC team, which is providing support to the BDCP Steering Committee. They are intended to enable the SAIC team to undertake a coarse modeling of the different conservation strategy options now undergoing a comparative evaluation to assist the Steering Committee in narrowing down the options for purposes of furthering the planning process. They are not designed to nor intended to represent proposed operational parameters for the system by either the SAIC team or any entity on the Steering Committee, nor should they be misconstrued as such.

DRAFT

			migration/survival, pre-spawning migration by delta smelt, splittail, and others
Feb-Jun	No criterion	No criterion	Evaluation parameter
Jul-Aug	No criterion	4,000 cfs	Steelhead and salmon rearing within the mainstem river; support resident fish habitat
San Joaquin River flow at Vernalis			
May	VAMP flow requirements	D-1641 flow requirements	The flow range was selected to reflect the current range of conditions intended to improve juvenile Chinook salmon emigration survival
Jul-Sep	No criterion	No criterion	Evaluation parameter
Oct	1,400 cfs	2,000 cfs	Attraction flows and improved water quality (DO and temperature) for adult salmon migration – equivalent to D-1641
Nov-Jan	D-1641 water quality requirements	1,500 cfs	Salmon fry rearing and dispersal, nutrient transport to Delta, splittail spawning and larval rearing and dispersal
Feb-Apr and Jun	D-1641 flow requirements of approximately 1,420 cfs	D-1641 flow requirements of approximately 2,280 cfs	D-1641 X_2 contribution results in a range of San Joaquin River flows
X_2			
Feb-June	D-1641 X_2 locations	66 km	The range of X_2 locations during the late winter-spring is intended to reflect (1) the current regulatory requirements and (2) an expansion of low-salinity habitat further downstream within Suisun Bay (66 km)
Jul-Jan	No criterion	No criterion	Evaluation parameter
Total Delta Outflow	No criterion	No criterion	Evaluation parameter
Hydraulic Residence Time in Selected Delta Channels	No criterion	No criterion	Evaluation parameter

DRAFT

DCC			
Feb-Jun	Closed	Open	The range in DCC operations was intended to reflect (1) reduced movement of juvenile salmon and steelhead into the interior Delta; improved juvenile salmon survival, and (2), improved hydrodynamics for delta smelt within the central Delta and reduced vulnerability to SWP/CVP diversions
Jul-Jan	Open	Open	Improve hydrodynamics and water quality within the central Delta; reduce the potential barrier to fish movement into and out of the central Delta
SJRB – Installed in the San Joaquin River to direct fish and flows into Old River			
Mar-May	Closed	Closed	Reduce movement of juvenile salmon and steelhead into the southern Delta through the lower San Joaquin River and facilitate juvenile Chinook salmon passage into the central Delta through Old River; improve salmonid survival and reduce their vulnerability to SWP/CVP diversions
Jun-Aug	Closed	Closed	Increase flows and flushing within the southern and central Delta to improve water quality
Sep-Nov	Closed	Closed	Improve attraction flows and water quality for adult salmon within the lower San Joaquin River
Dec-Feb	Closed	Closed	Reduce movement of salmon fry into the southern Delta; improve salmonid survival and reduce their vulnerability to SWP/CVP diversions
Old River Flows			
Year-round	No criterion – No reverse flows are	No criterion – No reverse flows are	Reduce vulnerability of delta smelt and other species to SWP/CVP diversions by isolating Old River habitat from the hydraulic influence

DRAFT

	expected from SWP/CVP diversions; model output to assess	expected from SWP/CVP diversions; model output to assess	of the diversion facilities; increase hydraulic residence time in the Old River region to increase primary and secondary production and provide low velocity habitat for delta smelt and other fish species; operate the Old River siphon to allow salmon, other fish, nutrients, phytoplankton, and zooplankton produced in the San Joaquin River to flow into the central Delta
Middle River Flows			
Mar-May	No criterion	>-2,000 cfs	The range in Middle River flows reflects two alternative hypotheses including (1) Middle River has been designated as the water conveyance route for SWP/CVP diversions; channel capacity may be limited by levee scour and water depths, and (2) larval and juvenile delta smelt, splittail, Chinook salmon, steelhead, and other fish produced in the Mokelumne and Cosumnes rivers and east-side channels and sloughs; reduced reverse flows are intended to reduce vulnerability to entrainment and SWP/CVP diversion effects
Jun	No criterion	>-6,000 cfs	The range in Middle River flows reflects (1) Middle River has been designated as the water conveyance route for SWP/CVP diversions; channel capacity may be limited by levee scour and water depths, and (2) most juvenile fish have grown to a size where swimming performance allows habitat selection or they have moved downstream into Suisun Bay and outside the area of influence; the majority of juvenile salmon and steelhead have emigrated from the Delta
Jul-Sep	No criterion	>-8,000 cfs	Middle River has been designated as the water conveyance route for SWP/CVP diversions; channel capacity may be limited by levee scour and water depths. Most of the sensitive covered fish species are not present in the central and southern Delta during the summer and therefore have reduced vulnerability to SWP/CVP diversions
Oct-Nov	No criterion	>-4,000 cfs	The range in Middle River flows reflects two alternative hypotheses including (1) Middle

DRAFT

			River has been designated as the water conveyance route for SWP/CVP diversions; channel capacity may be limited by levee scour and water depths, and (2) adult Chinook salmon are migrating upstream into the Mokelumne and Cosumnes rivers; reduced reversed flows in Middle River are intended to reduce migration delays and improve hydrodynamic cues and attraction flows
Dec-Feb	No criterion	>-4,000 cfs	The range in Middle River flows reflects two alternative hypotheses including (1) Middle River has been designated as the water conveyance route for SWP/CVP diversions; channel capacity may be limited by levee scour and water depths, and (2) Chinook salmon fry and steelhead smolts are emigrating through the Delta from the Mokelumne and Cosumnes rivers; reduced reverse flows are intended to reduce vulnerability to diversion effects; early spawning fish have planktonic larval and juveniles within the central Delta that could be vulnerable to hydraulic entrainment within Middle River
QWEST			
Mar-May	No criterion	Net positive flows (no reverse flow)	The range in QWEST reflects two alternative hypotheses including (1) no data or analyses have been developed to demonstrate a relationship between the magnitude of QWEST and adverse impacts to delta smelt, salmon, or other fish species; evaluation criterion, and (2) reduced QWEST is intended to result in reduced movement of juvenile salmon, steelhead, larval and juvenile delta and longfin smelt, juvenile splittail, and other fish from the Sacramento River into the Delta; increased transport of plankton fish eggs, larvae, and juveniles downstream into Suisun Bay; increased transport of zooplankton and nutrients downstream into Suisun Bay; reduced the vulnerability of fish to SWP/CVP diversions; reduced delays in downstream migration of juvenile salmon and other fish
Jun	No criterion	Net positive flows (no	The range in QWEST reflects two alternative hypotheses including (1) no data or analyses

DRAFT

		reverse flow)	have been developed to demonstrate a relationship between the magnitude of QWEST and adverse impacts to delta smelt, salmon, or other fish species; evaluation criterion, and (2) the densities of juvenile fish potentially affected by QWEST are reduced in the central Delta by June and therefore the potential benefit is reduced; reduced movement of juvenile salmon, steelhead, larval and juvenile delta and longfin smelt, juvenile splittail, and other fish from the Sacramento River into the Delta; increased transport of plankton fish eggs, larvae, and juveniles downstream into Suisun Bay; increased transport of zooplankton and nutrients downstream into Suisun Bay; reduced vulnerability of fish to SWP/CVP diversions; reduce potential delays in downstream migration of juvenile salmon and other fish
Jul-Nov	No criterion	Net positive flows (no reverse flow)	The range of QWEST values are intended to reflect two alternative hypotheses including (1) delta smelt and other fish have reached a size where swimming performance allows volitional habitat selection; many fish are located downstream in Suisun Bay and are not in the area affected by QWEST, and (2) reduce the movement of adult delta smelt from the Sacramento River into the interior Delta and thereby reduce their vulnerability to SWP/CVP diversions
Dec-Feb	No criterion	Net positive flows (no reverse flow)	Reduce the movement of adult delta smelt from the Sacramento River into the interior Delta and thereby reduce their vulnerability to SWP/CVP diversions
SWP/CVP VAMP Diversions			
April	No criterion	VAMP	The range of SWP/CVP diversions is intended to reflect (1) opportunistic diversions used as a model evaluation parameter, and (2) start of the peak period of juvenile salmon emigration through the Delta; larval stages of delta smelt, longfin smelt, splittail, and other fish are present in the Delta in relatively high densities

DRAFT

			and are vulnerable to diversion losses, VAMP diversion rates are intended to provide a higher level of protection from diversion related direct and indirect effects; extend the VAMP period to two months is intended to increase the seasonal period of protection
May	VAMP	VAMP	VAMP diversion rate reductions are intended to provide increased protection for juvenile salmon emigrating from the Mokelumne and Consumes rivers and other species; peak period of smolt migration occurs in May in many years; assumes for modeling that VAMP period is in May however the actual period may vary

Assumptions:

•Water conveyance and south of Delta storage are assumed to not limit diversion operations– model evaluation parameter.

•Upstream reservoir storage and releases will be made in accordance with current requirements to support salmon and steelhead habitat and maintain suitable water temperatures and compliance with existing agreements and regulatory requirements including FERC conditions and ESA requirements.

•The barriers could be closed year-round, but may be periodically opened to promote flushing and improved water quality within the Old River region. The Old River regions of the Delta could function, as improved aquatic habitat while the Middle River region would serve as an in-Delta water conveyance facility. A siphon would be installed to allow water, fish, and nutrients produced in the San Joaquin River to flow out of Old River into the central Delta.

DRAFT