Table 2. List of Priority Hypotheses.

X-Y Graph number	Link to CEM Hypotheses	Description of hypothesis	Description of alternative/competing hypotheses	Rationale based on Prioritization Criteria
System				
S1	S-1, S-2	The Platte River form can be modified by either mechanical/sediment/flow management (i.e., clear/level/ pulse) or mechanical means along with non-Program managed flows (i.e., clear/level/mechanical).		Influence Program management, goals, and objectives
S1a	S-1, S-2, S-4	Program channel habitat restoration actions will result in detectable change to Platte River form and function	Can not detect a significant effect on indicators	Influence Program management, goals, and objectives
S1b	S-3	Program land management actions (i.e., restoration into habitat complexes) will have a detectable effect on target birds species use of the associated habitats	Can not detect a significant effect on indicators	Influence Program management, goals, and objectives
S1c	S-1, S-2	Program actions will increase functional wet meadows in habitat complexes during the first increment		Influence Program management, goals, and objectives
S2	S-1, S-2	Implementing Program land and water management actions (i.e., habitat complexes and clear/level/pulse) will have a detectable effect on other species use of the associated habitats	Within the overall management objectives for whooping crane, terns and plovers, and pallid sturgeon, benefits can be provided to non-target listed species and non-listed species of concern thereby reducing the likelihood of future listing and improve overall ecosystem diversity.	Influence Program management, goals, and objectives

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Terns and Plover				
T1	TP-1, TP-2, TP-3	Additional bare sand habitat will increase the number of adult least terns.	bare sand is not currently limiting number of adults	Critical path for Program goals and objectives
T2	TP-4	Tern productivity is related to the number of prey fish (<3 inches) and fish numbers limit tern production below 800 cfs from May-Sept.	prey fish do not limit tern production at 799 cfs or tern production is limited by summer flows of < 50 cfs	On critical path for Program, will influence future water management
T2a	TP-4	Flow rates influence the number and species diversity in tern prey base (fish).	tern productivity not affected by fish community species diversity	On critical path for Program, will influence future water management
P1	TP-1, TP-2, TP-3	Additional bare sand habitat will increase the number of adult piping plover.	bare sand is not currently limiting number of adults	Critical path for Program goals and objectives
P2	TP-4	Plover productivity is related to the number of suitable macroinverts and macroinverts limit plover production below 800 cfs from May-Sept.	macroinverts do not limit plover production at 799 cfs or plover production is limited by summer flows of < 50 cfs	On critical path for Program, will influence future water management
TP 1	TP-2	Interaction of river and sandpit habitat.	LT and PP show no preference for the river over sandpits	Address areas of disagreement
TP 2	TP-1, TP-2, TP-3	The central Platte River may act as a source or sink for terns and plovers.	currently not a sink	Will be addressed through current monitoring effort
TP 4d	TP-1, TP-2	Correlation between river island habitat and flow.		Address areas of disagreement, potential impacts to Program management
TP 5	TP-1	Use of riverine islands by least terns and piping plovers will increase with active channel width.	use will not increase with channel width	Will influence Program management
Whooping Cranes				
WC 1	WC-1, WC-2, WC-3	Whooping Crane use will increase as function of Program land and water management activities.	Whooping Crane use will not increase as function of Program land and management activities.	Influences Program management

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WC 3	WC-1, WC-2, WC-3	Whooping crane use is related to habitat suitability.The prediction of habitat suitability for whooping crane in channel habitat as a function of water depth (preferred depth?) and channel width (define as wetted width, open width other?)	WC use of areas is not directly linked to FWS habitat suitability values	Influences Program management and Program goals and objectives
WC 4	WC-3	Whooping crane use of the central Platte River study area will increase proportionally to an increase in wet meadows	WC do not use wet meadows currently and are unlikely to respond to increases in wet meadow area	Influence Program goals and objectives
WC 5	WC 4	Whooping cranes are adversely affected by nocturnal disturbances that lead to flushing (walking or flying) which could lead to potential mortality.	WC are not negatively impacted by nocturnal disturbances	High degree of disagreement
Pallid Sturgeon				
PS-1	PS-1, PS-2	Program flow/sediment management will result in a positive species response by the pallid sturgeon in the lower Platte River.	Program flow/sediment management will result in no increase in species use/occurrence by the pallid sturgeon in the lower Platte River.	Influences Program management and Program goals and objectives
PS-2	PS-2	Program water management will result in measurable changes on flow in the lower Platte River.	Program water management will result in statistically insignificant changes on flow in the lower Platte River	Influences Program management and Program goals and objectives
PS-4	PS-1, PS-2	Flows in the lower Platte will affect pallid sturgeon habitat suitability.	Flows in the lower Platte River will have no effect on pallid sturgeon habitat suitability	Influences Program management and Program goals and objectives
PS-5	PS-1	Pallid sturgeon habitat suitability is maximized between water temperatures of X and Y in the lower Platte River.	pallid sturgeon use is independent of river water temperature	Influences Program management and Program goals and objectives

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PS-6	PS-1, PS-2	Increasing flow in the lower Platte will affect pallid sturgeon habitat availability.	increasing flow in the lower Platte River will have no effect on pallid sturgeon habitat availability	Influences Program management and Program goals and objectives
PS-7	PS-1	Increasing habitat availability in the lower Platte will increase pallid sturgeon use.	pallid sturgeon use is independent of lower Platte River habitat availability	Influences Program management and Program goals and objectives
PS-9	PS-2	Increasing Program flow releases will decrease water temperatures in the lower Platte River.	River water temperature is independent of flow rate in the lower Platte River Increases in program flow releases will increase water temperatures on the lower Platte River	Influences Program management and Program goals and objectives
PS-11	PS-3	Non-Program actions (e.g., harvest, stocking, Missouri River conditions) determine the occurrence of pallid sturgeon in the lower Platte River	Program actions will affect the rate of occurrence of pallid sturgeon in the lower Platte River such that use is disproportionate to external factors (e.g., stocking, harvest, local conditions) relative to local population.	Influences Program management and Program goals and objectives
Physical Processes - Flow				
Flow #1	PP-1	Increasing the variation between river stage at peak (indexed by Q1.5 flow at Overton) and average flows (1,200 cfs index flow), by increasing the stage of the peak (1.5-yr) flow through Program flows, will increase the height of sand bars between Overton and Chapman by 30% to 50% from existing conditions.	Flow magnitudes and channel compilations are insufficient to generate bars high enough to provide habitat for LT and PP. Bars may quickly vegetate making them poor habitat for target species. Bars can be created/maintained by mechanical/other means.	Fundamental to testing the Flow, sediment, mechanical strategy

X-Y Graph number	Link to CEM Hypotheses	Description of hypothesis	Description of alternative/competing hypotheses	Rationale based on Prioritization Criteria
Flow #3	PP-1	Increasing 1.5-yr Q with Program flows will increase local boundary shear stress and frequency of inundation at existing green line (elevation at which riparian vegetation can establish). These changes will increase riparian plant mortality along margins of channel, raising elevation of green line. Raised green line = more exposed sandbar area and wider unvegetated main channel.	Insufficient Program flows to adequately increase shear stress on banks. Plant mortality can be achieved by other means.	Fundamental to testing the Flow, sediment, mechanical strategy
Flow #4	PP-1	Annual riparian seedling mortality greater than 90% is required to prevent riparian encroachment on exposed bars, thereby increasing (maintaining at least 10 acres/mile) exposed bars between Overton and Grand Island that are usable as LT and PP habitat.	Riparian seedling mortality greater than 90% is needed to increase exposed bar area. Other factors drive exposed bar area instead of seedling mortality. Plant mortality can be achieved by other means.	Fundamental to testing the Flow, sediment, mechanical strategy
Flow #5	PP-1	Increasing magnitude and duration of a 1.5-yr flow will increase riparian plant mortality along the margins of the river. There will be different relations (graphs) for different species.	Insufficient Program flows to maintain required flow durations. Plant mortality can be achieved by other means.	Fundamental to testing the Flow, sediment, mechanical strategy

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Physical Processes - Sediment				
Sediment #1	PP-2	Average sediment augmentation nr Overton of 185,000 tons/yr under existing flow regime and 225,000 tons/yr under Governance Committee proposed flow regime achieves a sediment balance to Kearney.	Augmentation greater than or less than 225,000 tons/year is needed to balance the sediment budget and increase exposed bar area. There is no sediment imbalance. Exposed bar area or occurrence of braiding will not be affected by increased sediment. Sediment balance is insignificant except in local instances. Satisfactory bar areas can be created and maintained through strictly mechanical actions.	Fundamental to testing the Flow, sediment, mechanical strategy
Sediment #2	PP-2	A balanced sediment budget (sediment augmentation of 225,000 tons/year near Overton under proposed Governance Committee flows) when implemented with mechanical actions (channel consolidation & widening) in anastomosed reaches will promote braided channel morphology with an average braiding index in the main channel of greater than 3.	Flows and sediment augmentation are insufficient to achieve desired braiding index.	Fundamental to testing the Flow, sediment, mechanical strategy
Sediment #3	PP-2	Increasing the average braiding index of the main channel by achieving a balanced sediment budget, increases the active unvegetated width of the main channel at an index flow of 2,000 cfs(at Overton).	Width will not change with increasing braiding index	Fundamental to testing the Flow, sediment, mechanical strategy

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Sediment #4	PP-2	Increasing the average braiding index to greater than 3 for the main channel in the sediment deficient reach near Overton will increase and maintain exposed bar area greater than 1.5 acres in the reach between Overton and Kearney at an index flow of 1,200 cfs (at Overton).	There is no relationship between braiding index and area of exposed bars. Exposed bars may be created (maintained) through mechanical means without need to change braiding index.	Fundamental to testing the Flow, sediment, mechanical strategy
Physical Processes - Mechanical				
Mechanical #2	PP-3	Increasing the Q1.5 in the main channel by consolidating 85% of the flow, and aided by Program flow and a sediment balance, flows will exceed stream power thresholds that will convert main channel from meander morphology in anastomosed reaches, to braided morphology with an average braiding index > 3.	Higher stream power (higher 1.5 yr Q and/or more consolidation of side channels) needed to convert channel to braided morphology. Lower stream power will convert channel to braided morphology	Fundamental to testing the Flow, sediment, mechanical strategy
Mechanical #3	PP-3	Reducing the number of channels in a transect to 3 or less under balanced sediment budget will convert anastomosed reaches of the Platte River between Overton and Chapman to a braided channel morphology. With proposed flow regime, should occur with greater number of channels	Reducing the number of channels in a transect to 1 or 2 is necessary to achieve an average braiding index in the main channel of greater than 3.	Fundamental to testing the Flow, sediment, mechanical strategy

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Mechanical #4	PP-3	Increasing the average braiding index to greater than 3 in the main channel by channel manipulation will promote in the Platte River at the mechanically changed sites a total main channel wetted width exceeding 500 to 750 ft at an index flow of 1,700 cfs (at Overton).	A braiding index greater then 4 is needed to achieve a width greater than 500 ft There is no relation between braiding index and channel width	Fundamental to testing the Flow, sediment, mechanical strategy
Mechanical #5	PP-3	Increasing the average braiding index to greater than 3 for the main channel by mechanical channel manipulation, will increase and maintain exposed bar area greater than 1.5 acres at mechanical changed sites at an index flow of 1,200 cfs (at Overton).	Mechanically consolidating flows will have no effect on areal extent of bars.	Fundamental to testing the Flow, sediment, mechanical strategy
Wet Meadows				
WM-2	PP-4	Wet meadows producing the optimum productivity and diversity of macro-invertebrates potentially consumed by WC exhibit certain characteristic combinations of soils, hydrology, size and location. Mormon Island and adjacent to Rowe Sanctuary have some of best existing combinations	There are too many possible combinations of site characteristics to allow for a meaningful characterization of “desirable” conditions.	Basic information need to evaluate what conditions in wet meadows are important for productivity that is meaningful to WC use, Help inform what sites to acquire and/or protect/restore.
WM-3	PP-4	Shallow surface water and groundwater in March and April support high productivity and diversity of macroinvertebrates as potential food sources to WC in wet meadows.		Basic information need to evaluate what conditions in wet meadows are important for productivity that is meaningful to WC use, Help inform what sites to aquire and/or protect/restore.

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WM-4	PP-4	A predominance of organic-rich soils supports the productivity and diversity of macro-invertebrates as potential WC food sources in bottomland grasslands.	Wet meadows and their soils are too complex and variable to allow this individual factor to be effectively assessed.	Basic information need to evaluate what conditions in wet meadows are important for productivity that is meaningful to WC use, Help inform what sites to acquire and/or protect/restore.
WM-8a	PP-4	As the spring depth to groundwater increases, surface soils stay frozen longer. Where groundwater is closer to the surface soils thaw sooner.		Each site will respond to river channel stage uniquely, this hypothesis is a prerequisite to many of the other hypotheses (if there is no response from program actions, it becomes less important)