North Branch Park River Watershed Watershed Plan

Environmental Impact Statement Project Scoping

Planning Update

February 23, 2023

Cavalier, ND

Sponsoring Local Organization: Park River Joint Water Resource District

Lead Federal Agency: USDA-Natural Resource Conservation Service

- Joint Powers Agreement between Walsh County Water Resource District and Pembina County Water Resource District
- Formed in 2014 in response to frequent flooding in the North Branch Park River sub watershed.
- Efforts to develop a flood damage reduction project has been on-going since 2014.
- Park River JWRD has been working with NRCS to develop a project through their Watershed Program (Public Law 83-566) since 2016, through watershed planning funding secured by the Red River Retention Authority from NRCS.

Background (continued)

- Broad group of local, state, and federal agencies invited to participate in the planning process. U.S. Army Corps of Engineers & U.S. Fish and Wildlife Service agreed to be cooperating federal agencies on the planning effort, at the request of NRCS.
- Section 106 Consultation initiated with 30 Tribal Nations.
- Initial scoping meeting advertised on websites and the Cavalier Chronicle to the public, emailed to agencies and tribes. Assumption at the time was that we would be working towards a Plan- Environmental Assessment.
- Initial public scoping meeting held February 17, 2016 at the Mountain Community Center. Project team of interested individuals/agencies formed.
- 5 subsequent project team meetings and 3 public meetings held during planning process (most recently in 2019)

Meeting Purposes

1) NRCS internal technical review of the preliminary draft Watershed Plan-EA recommended it be converted to an EIS, for these reasons:

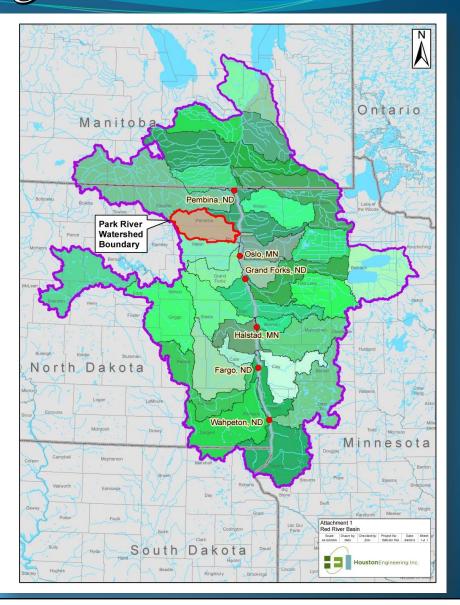
- Beneficial water quality impacts contributing towards International Joint Commission Red River Basin nutrient objectives
- Congressional approval of the watershed plan required due to cost and retention volume

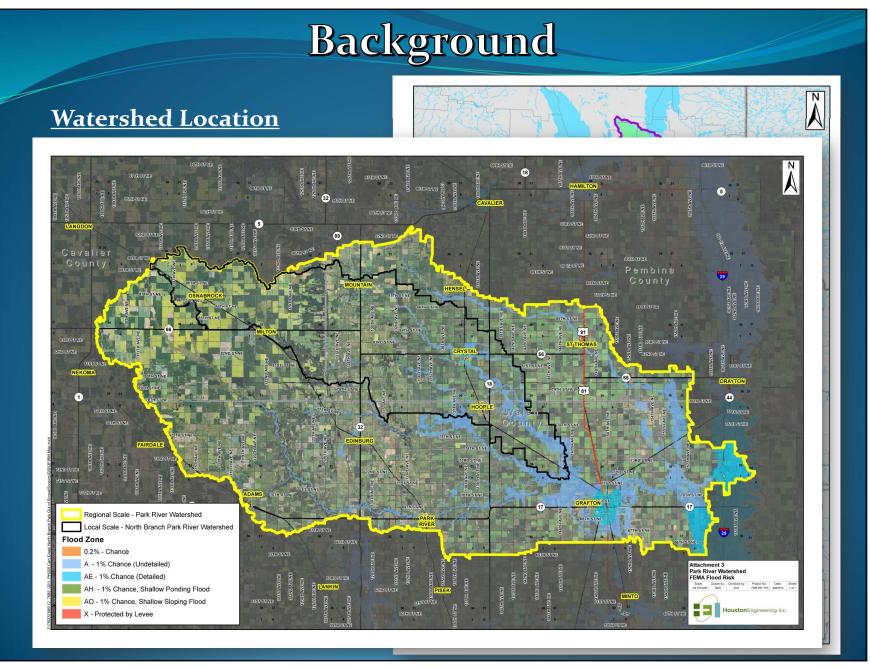
Therefore a new public scoping meeting was required.

2) Provide an update on planning progress and current iteration of Alternative 2 under consideration.

3) Solicit public comments

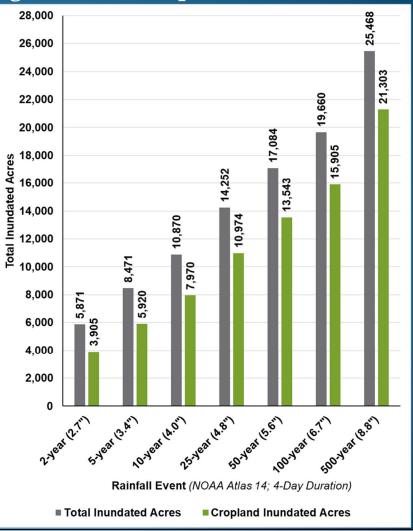
Watershed Location





Watershed Problems: Flooding on Agricultural Cropland

- Primary Crops
 - Spring Wheat
 - Soybeans
 - Corn
 - Sugar beets
 - Potatoes
- Operational Impacts
 - Late Plant Yield Loss
 - Partial and/or Total Plant Loss
 - Replanting Expenses
 - Additional Operating Expenses
- Reduced Revenue for Producers



Watershed Problems: Flood Damages to Infrastructure

- Roadways and Stream Crossings
 - Damage to Drive Surface
 - Embankment Damage
 - Road Washouts
- Financial Expense to Repair
- Commerce Disruptions
- Reduced Access (Public Safety)

Flood Event (NOAA Atlas 14 Rainfall; 4-Day Duration)	Unpaved Roadway (Lineal Feet)	Paved Roadway (Lineal Feet)
2-year (2.7")	4,788	720
5-year (3.4")	15,859	1,343
10-year (4.0")	26,825	1,615
25-year (4.8")	41,855	2,535
50-year (5.6")	55,084	5,827
100-year (6.7")	72,411	8,754
500-year (8.8")	112,198	20,346

Watershed Problems: Flood Damages to Structures

- 136 Structures in 100-year Flood Extents (Primarily in Crystal, ND)
 - 37 Residential Structures (homes and garages)
 - 49 Agricultural Structures
 - 37 Grain Storage Containers
 - 10 Commercial Structures
 - 3 Institutional Structures

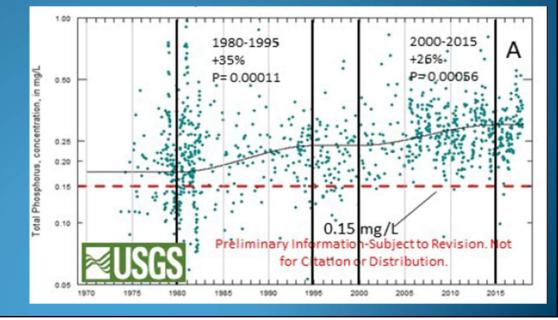
Flood Event	Exceedance Probability	Structure and Vehicle Damages	
100-year	0.01	\$	7,441,509
50-year	0.02	\$	5,262,028
25-year	0.04	\$	2,029,888
10-year	0.1	\$	1,212,240
5-year	0.2	\$	865,902
2-year	0.5	\$	454,224
Average Annual Damages		\$	770,811

Watershed Problems: Water Quality

- Non-Point Source Nutrient Loading
 - Total Phosphorus: 197,500 pounds per year
 - Total Nitrogen: 36,400 pounds per year



- North Branch Park River Listed as Impaired for Fish and Other Aquatic Biota
 - U.S. EPA 303(d) List
- Total Phosphorus Concentration Goal of 0.15 mg/L at International Border
 - Internationally Agreed to Objective
 - International Joint
 Commission
 - United States
 - Canada



Watershed Problems: Wildlife Habitat / Wetlands

- Located within the Prairie Pothole Region (PPR)
 - Between 50% and 80% of North American ducks breed in the PPR
 - Waterfowl populations closely follow availability of habitat & habitat condition
- Habitat opportunities are limited in the Planning Watershed
 - High agricultural production potential
 - Fragmented habitat with limited large contiguous blocks of prairie habitat

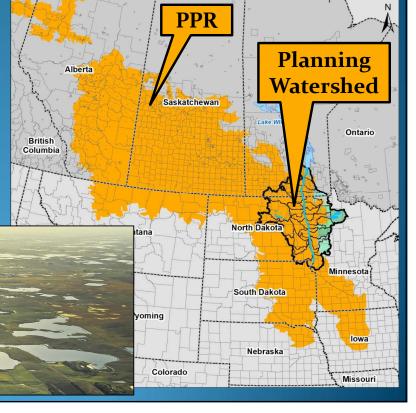


Image Source: ND Game and Fish Department

Watershed Plan Purposes

Flood Damage Reduction

- 1. Reduce flood damages on cropland
- 2. Increase flood resiliency for public and private infrastructure
- 3. Increase flood resiliency for the community of Crystal, ND

Watershed Protection

- 1. Reduce nutrient loads delivered from NB Park to the Red River, phosphorus in-particular.
- 2. Restore or enhance wetlands and wildlife habitat.



No-Action





No-Action

Alternative 1: Agricultural Levees (Stand-Alone)

> -Alternative 2:-Milton Dam-

Alternative 3: Cart Creek Impoundment Site 1

-Alternative 4: -Cart Creek Impoundment -Site 2-

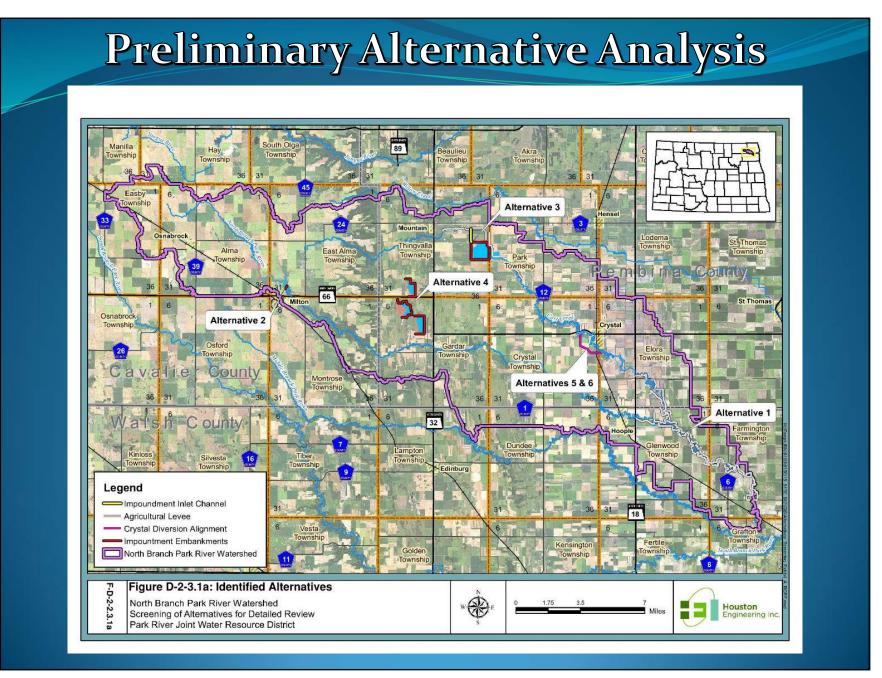
> Alternative 5: Diversion Channel (Crystal, ND)

Alternative 6: Diversion Channel (Crystal, ND) & Temporary Flood Storage-

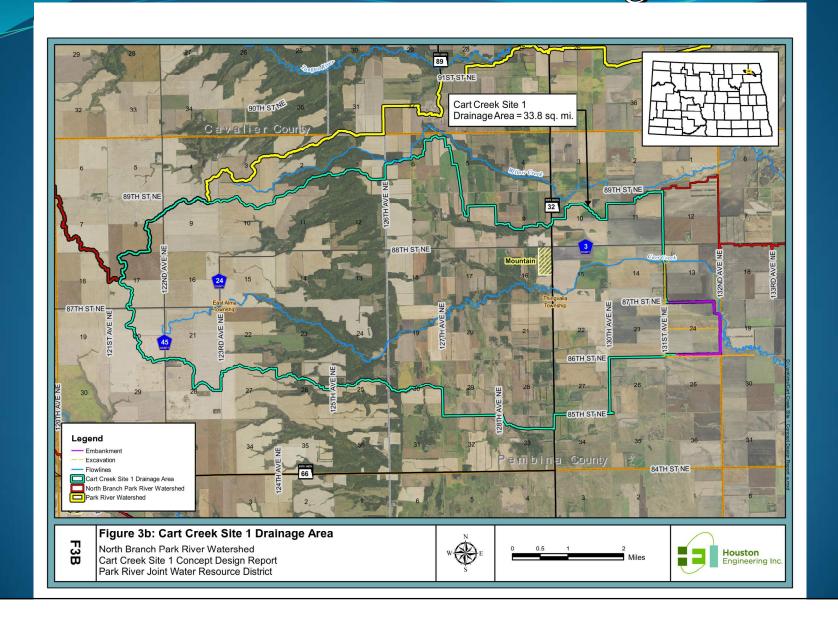
Carry Forward

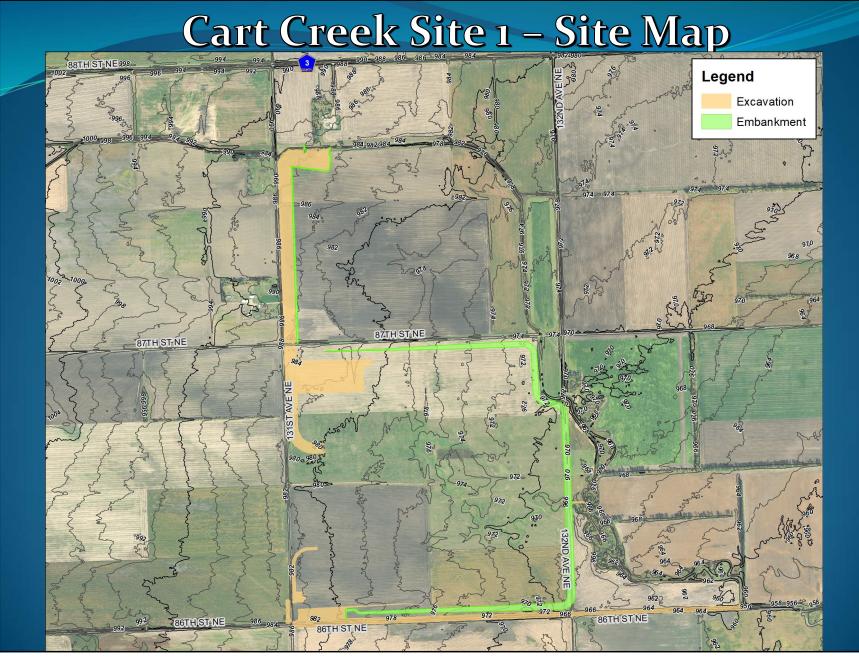
No-Action

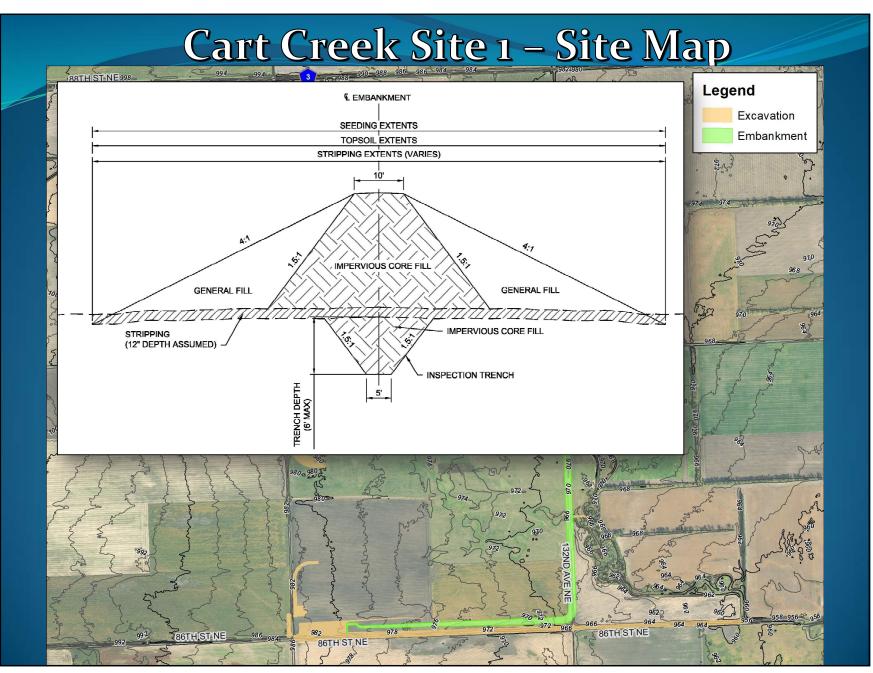
Alternative 3: Cart Creek Impoundment Site 1



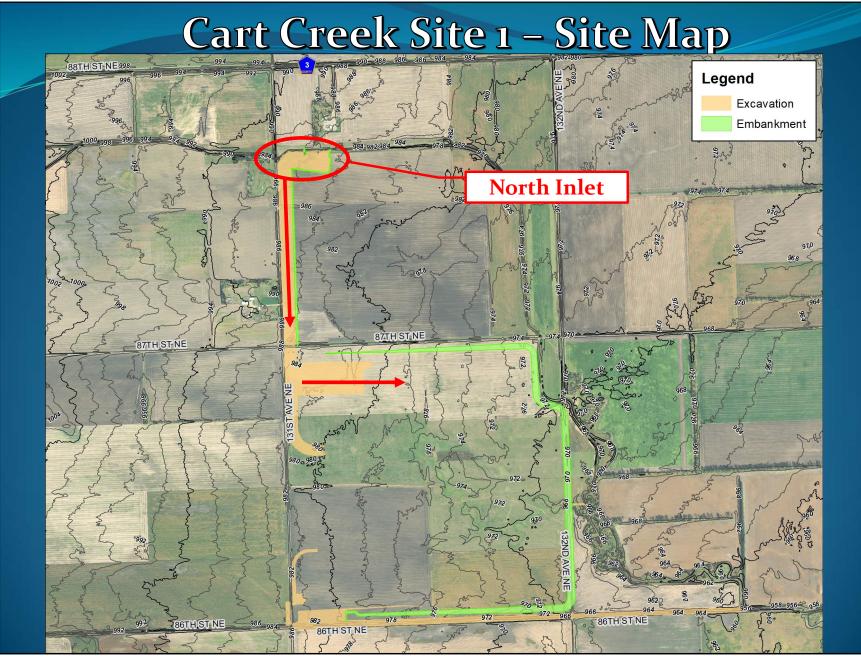
Cart Creek Site 1 – Drainage Area

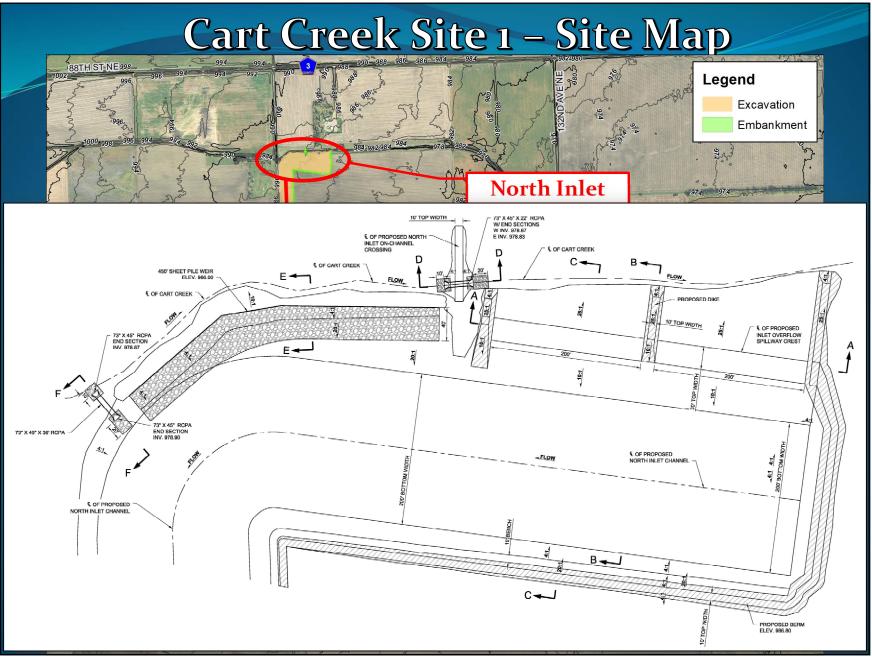


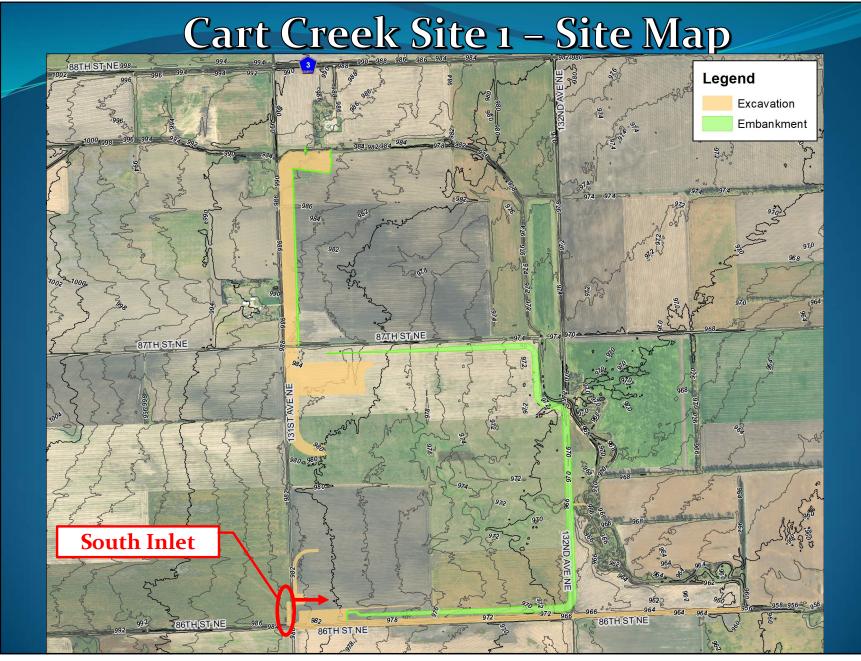


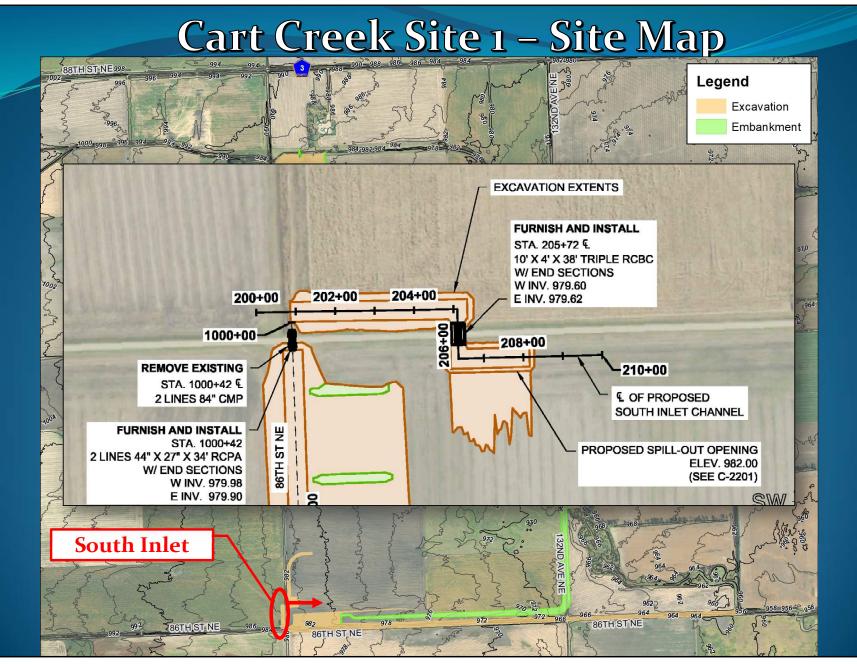


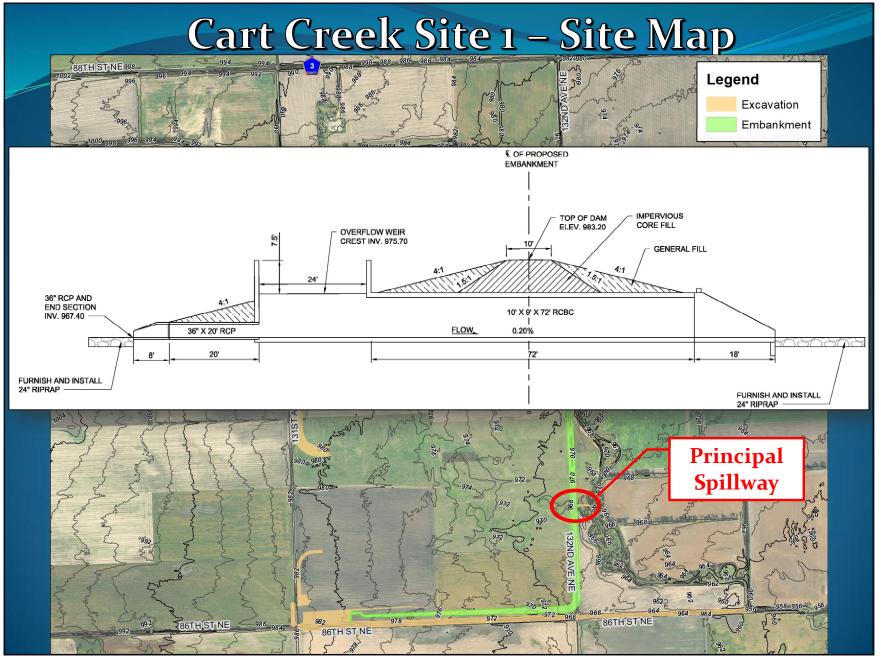
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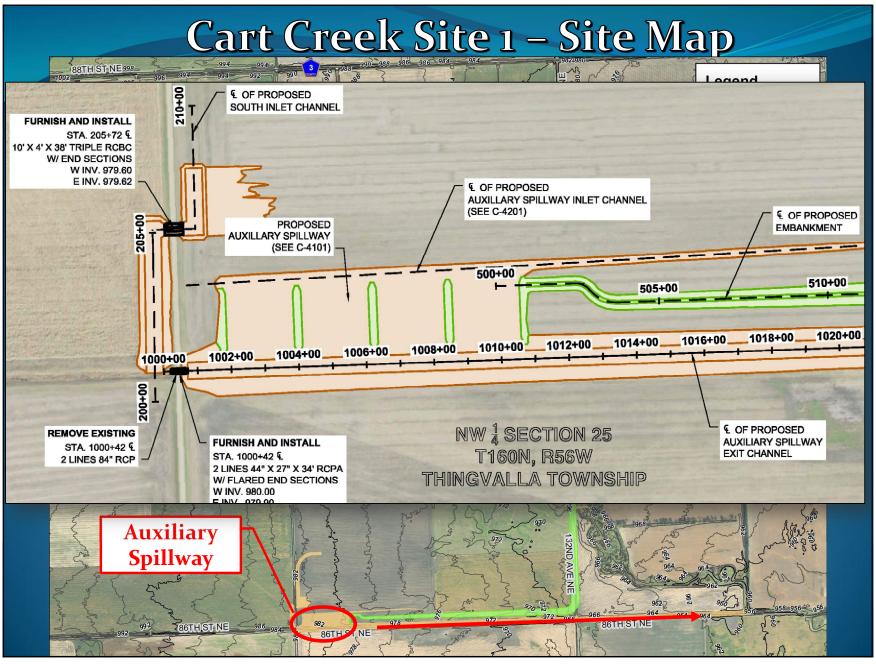


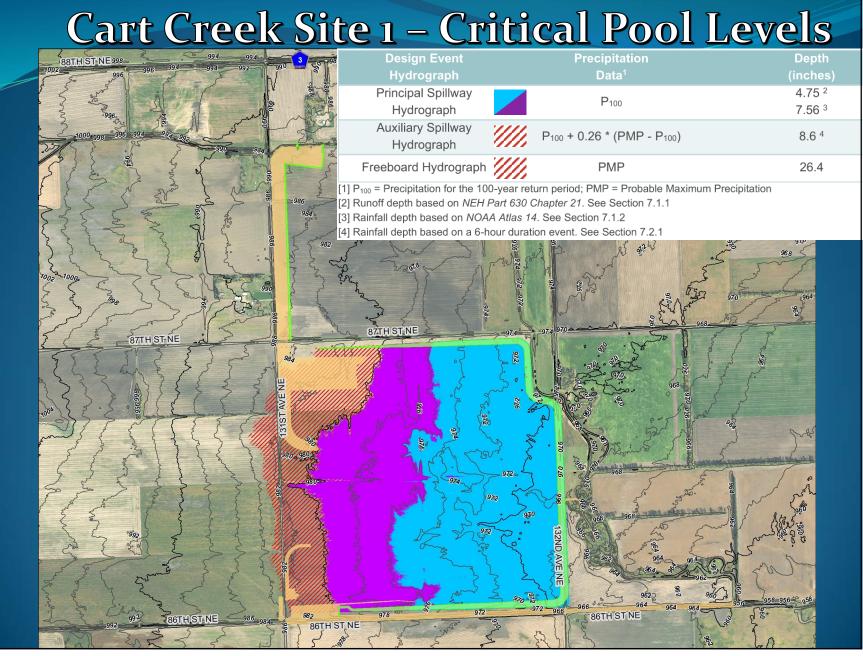


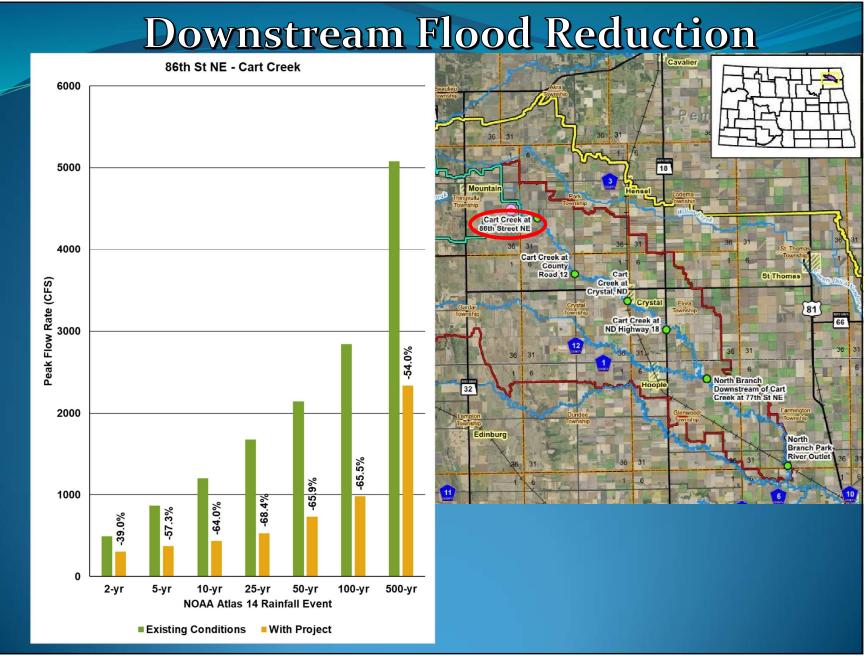


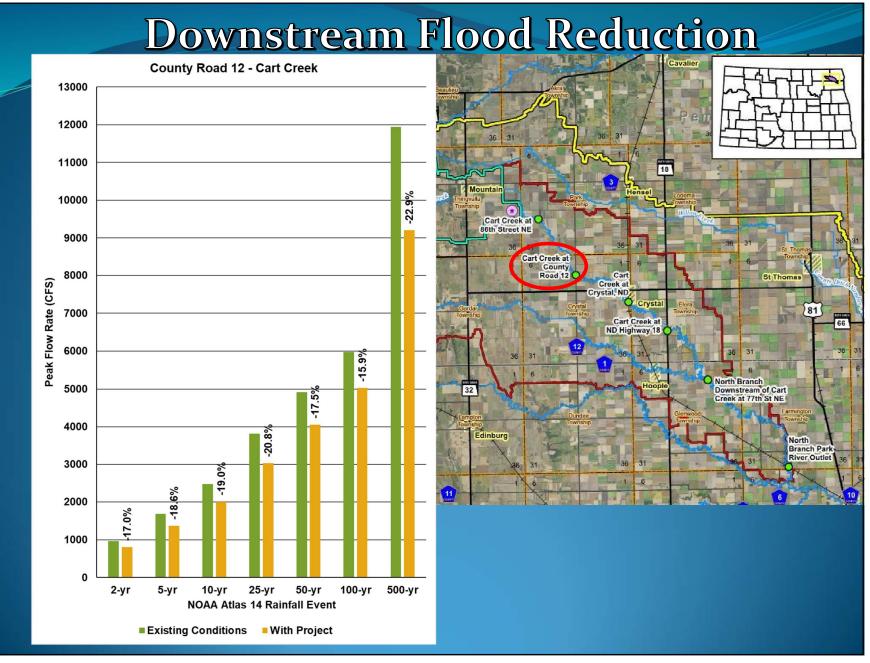


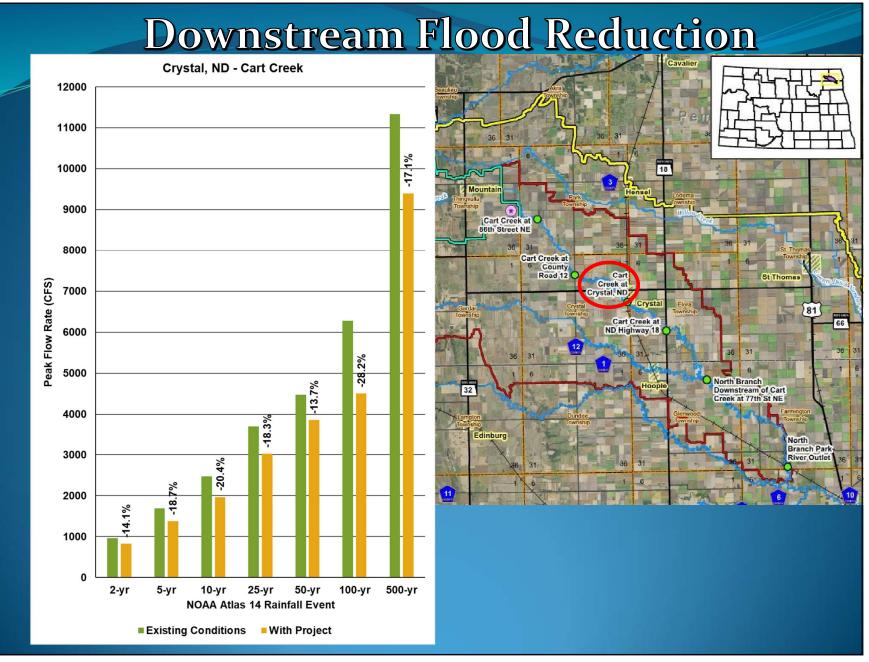


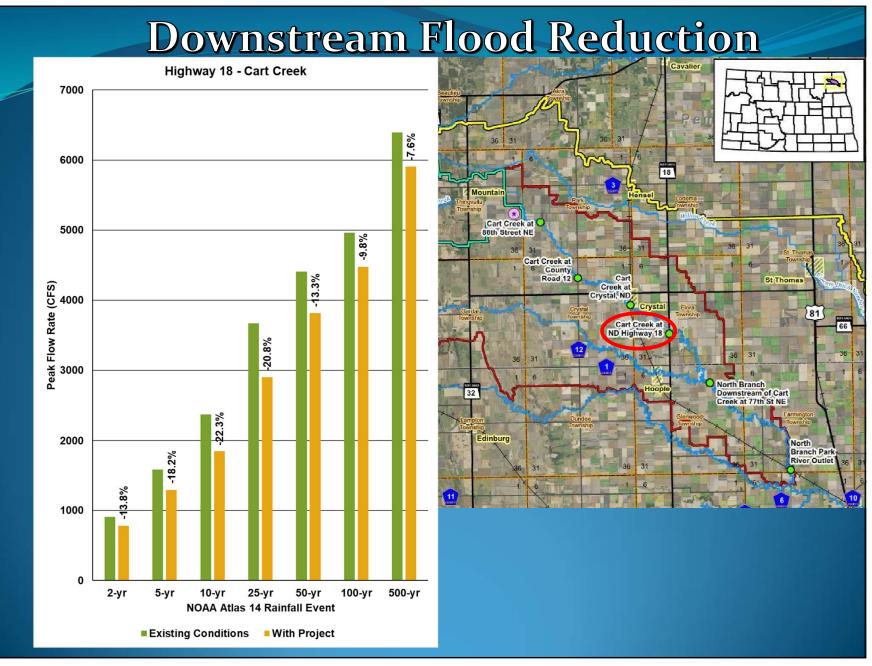


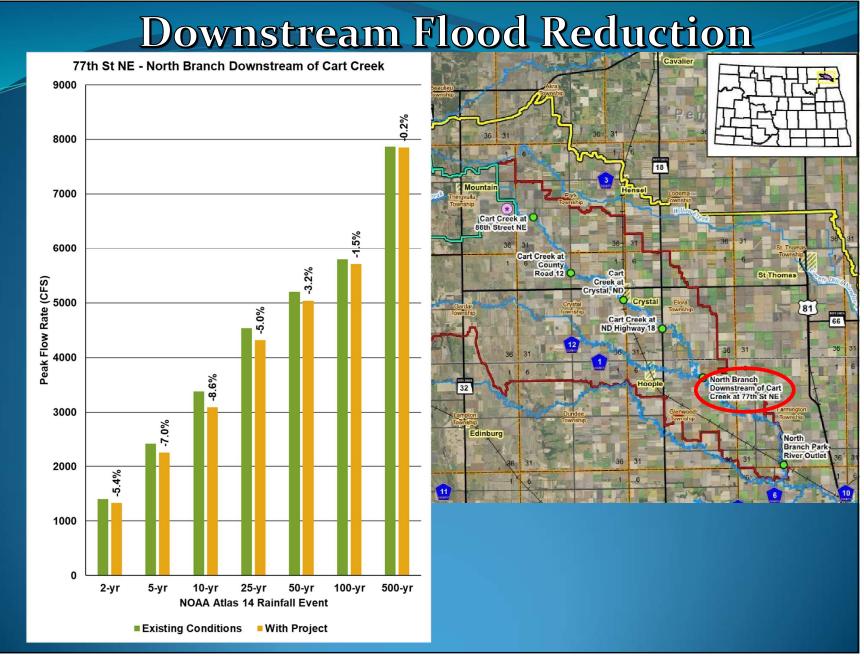


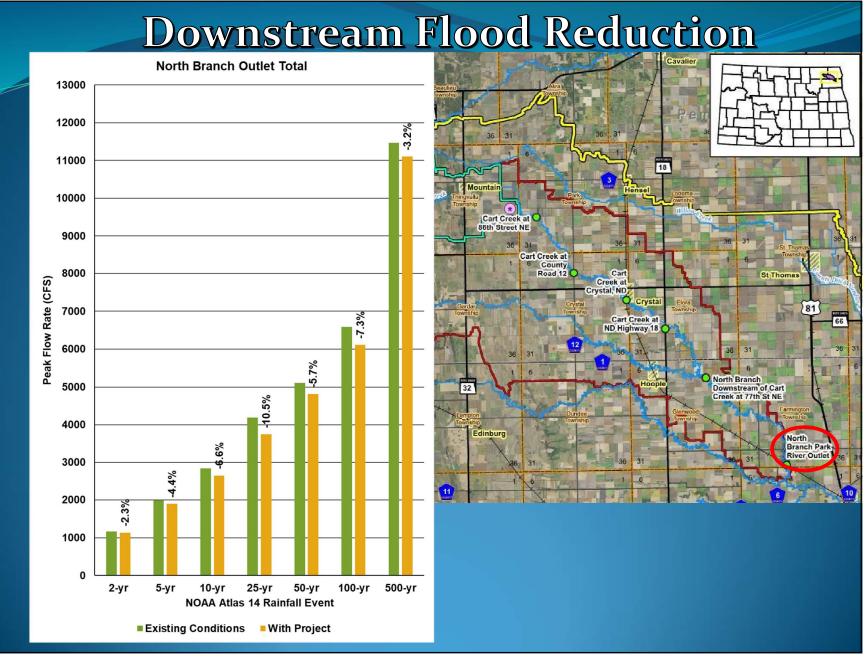


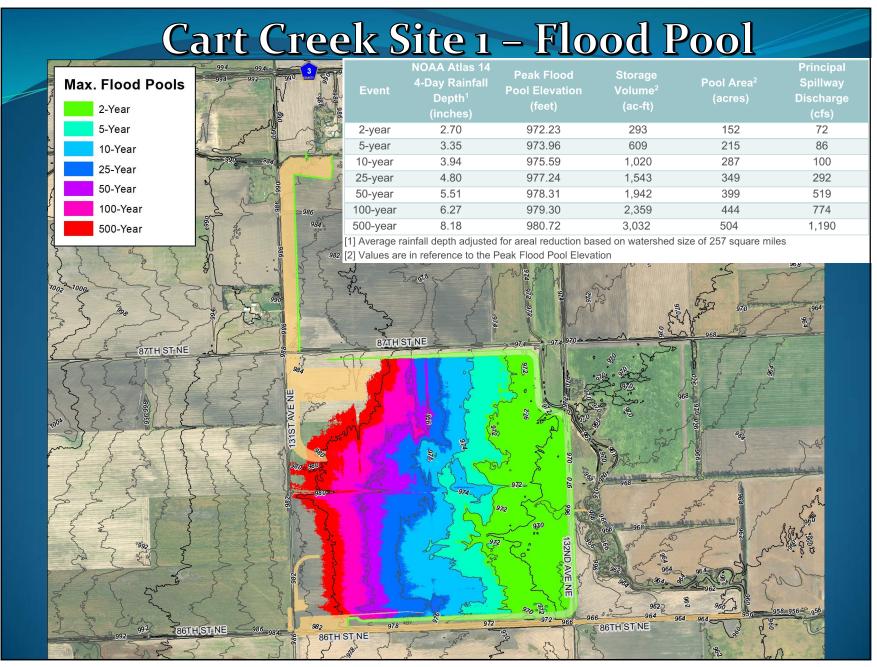


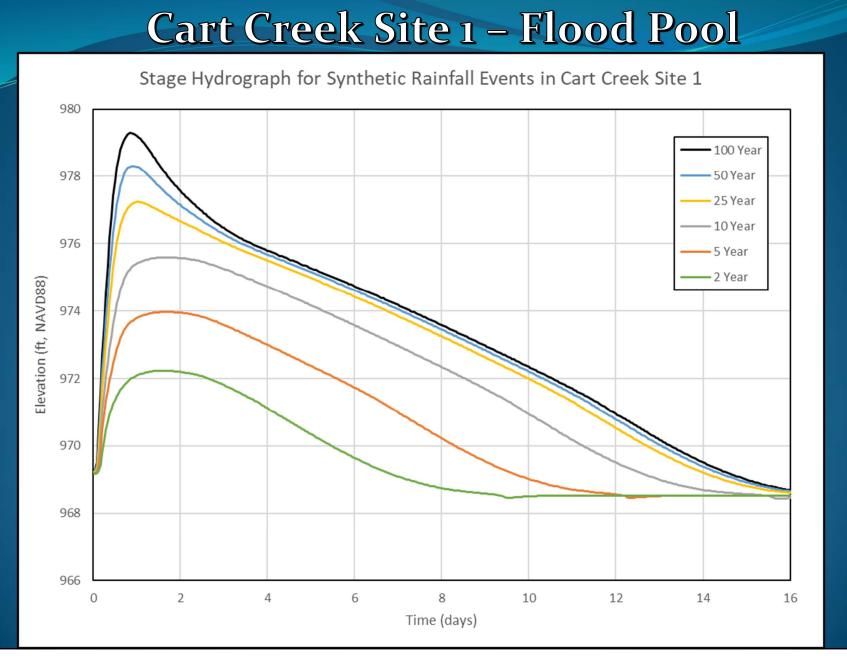








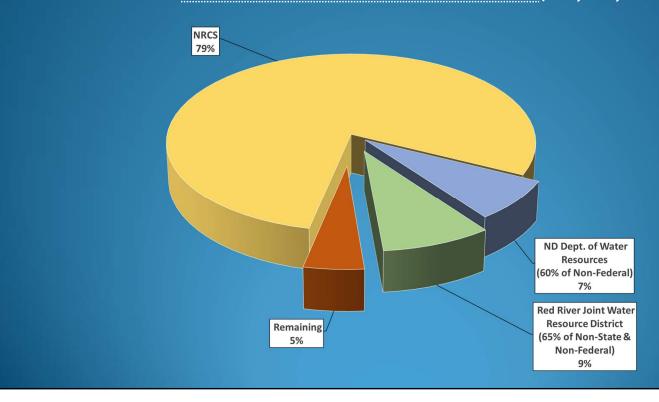




Opinion of Probable Costs

Project Installation Costs

Total:	\$ 12,228,700
Project Administration:	\$ 269,000
Real Property Rights:	\$ 1,924,700
Conservation Easement:	\$ 16,000
Engineering Services:	\$ 1,830,000
Construction:	\$ 8,189,000



Economic Analysis Flood Damage Reduction Benefits

	Estimated Av			Damage Reduction Benefit, Average Annual Equivalent Value ³		
Item	Without Project (Agriculture Related)	With Project (Agriculture Related)	Damage Reduction Benefit			
Floodwater ²						
Crop and Pasture	\$ 876,300	\$ 844,600	\$ 31,700	\$ 30,600		
Other Agricultural	\$ 473,600	\$ 378,600	\$ 95,000	\$ 91,600		
Residential	\$ 270,800	\$ 225,500	\$ 45,300	\$ 43,700		
Commercial	\$ 4,500	\$ 2,200	\$ 2,300	\$ 2,200		
Institutional	\$ 21,900	\$ 10,100	\$ 11,800	\$ 11,400		
Infrastructure	\$ 79,600	\$ 67,200	\$ 12,400	\$ 12,000		
Subtotal	\$ 1,726,700	\$ 1,528,200	\$ 198,500	\$ 191,500		
Insurance Administration Costs	\$ 6,300	\$-	\$ 6,300	\$ 6,300		
Total	\$ 1,733,000	\$ 1,528,200	\$ 204,800	\$ 197,800		

[1] Price Base 2019; 2018 normalized prices for cropland.

[2] Because all floodwater damages occur within rural communities; all flood water damages are considered agriculture-related.

[3] Amortized for 52 years at 2.875 percent.

Economic Analysis Flood Damage Reduction Benefits

Works of Improvement		Amortization of Installation Costs ²	Operation, Maintenance, and Replacement Cost	Total
Cart	Flood Retarding Structure	\$ 326,900	\$ 5,000	\$ 331,900
Creek Site 1	Water Quality / Wildlife Habitat Improvements	\$ 111,600	\$ 12,400	\$ 124,000
	Total Costs	\$ 438,500	\$ 17,400	\$ 455,900

Price Base 2019; 2018 normalized prices for cropland.
 Amortized for 52 years at 2.875 percent

Economic Analysis Flood Damage Reduction Benefits

Works of Improvement		Total Average Annual Agricultural Related Benefits ^{2,3}		Average Annual Costs ⁴		Benefit to Cost Ratio ⁵
Cart	Flood Retarding Structure	\$	197,800	\$	331,900	0.6 to 1.0
Creek Site 1 Water Quality / Wil	Water Quality / Wildlife Habitat Improvements		n/a	\$	124,000	n/a
	Total	\$	197,800	\$	455,900	0.4 to 1.0

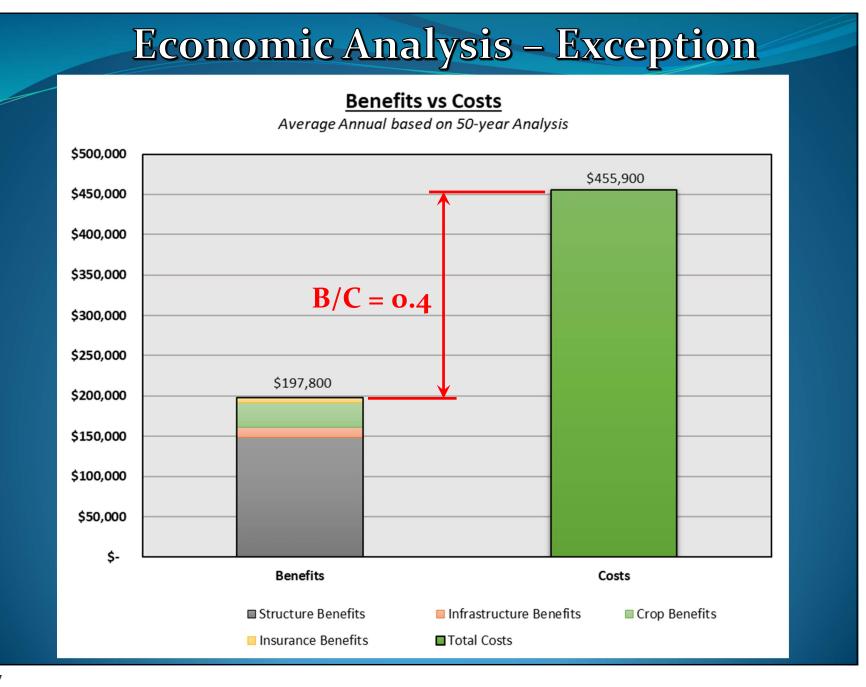
[1] Price Base 2019; 2018 normalized prices for cropland.

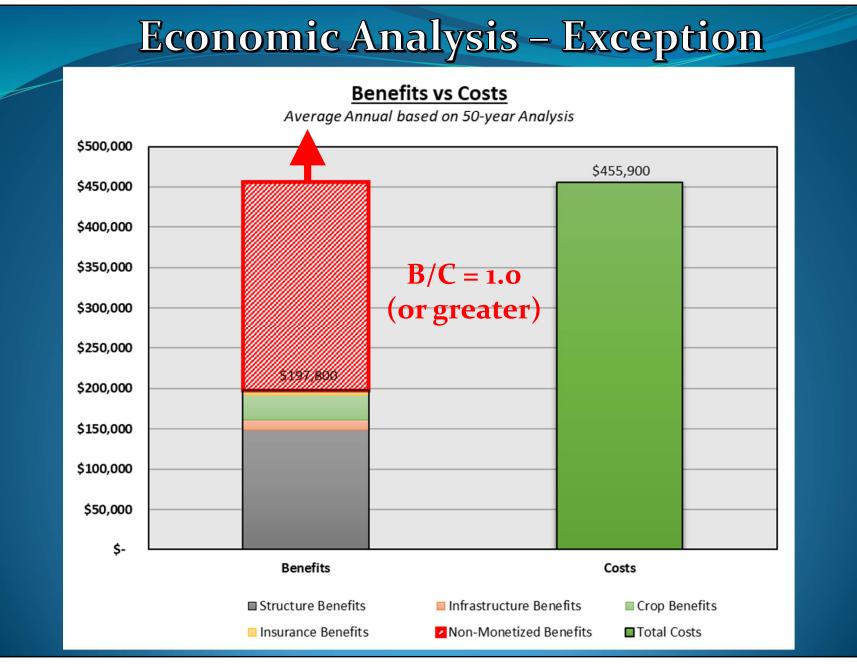
[2] Because all floodwater damage occurs within rural communities, all damages are considered agricultural-related

[3] Benefits related to watershed protection are presented qualitatively in the Watershed Plan EA and consist of water quality improvements and wildlife habitat.

[4] From Economic Table 4.

[5] See Watershed Plan EA Rationale for Plan Section. Unquantified benefits for the project include watershed protection, and an incremental contribution to the Regional Water Resource Plans





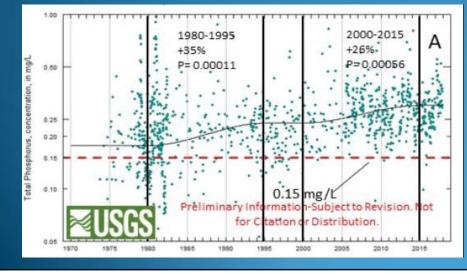
Water Quality Benefits – Phosphorus Reduction

1909 BOUNDARY WATERS TREATY 🛛 🌉

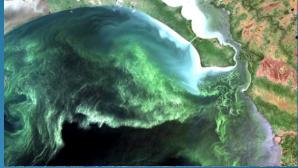
Article IV: "Boundary waters or waters flowing across the boundary shall not be polluted to the injury of the other."

IJC (U.S. & Canadian Governments) agreed to 0.15 mg/L TP objective @ Red River Border Crossing

Flow Averaged Trendline, TP @ Red River Border Crossing



Red River Outlet to Lake Winnipeg



Lake Winnipeg Beach

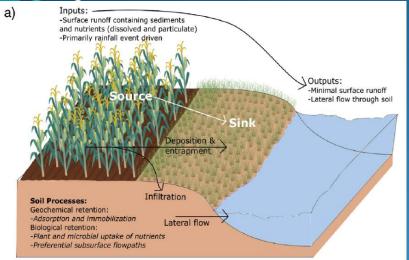


- U.S. portion of the RRB contributes 69-76% of TP to Lake Winnipeg despite being only 11% of the watershed
- Agricultural non-point source pollution (cropland) 65-80% of U.S. TP
- Low slope (~1 ft / mile) channel, wide flood plain (~100 mi), creates long time period for water-soil-plant residue interactions
- Lacustrine valley soils primarily finegrained (loam, silt, clay particles)
- Average of 85% of TP is transported in dissolved form on Red River tributaries
- Typical of cold climate, flat, lacustrine, agricultural landscapes across the world.



Vegetated Filter Strip / Field Buffer Example

Growing Season



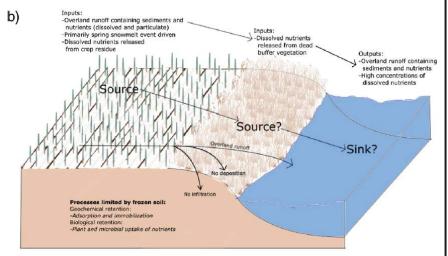
* Kieta et al, 2018

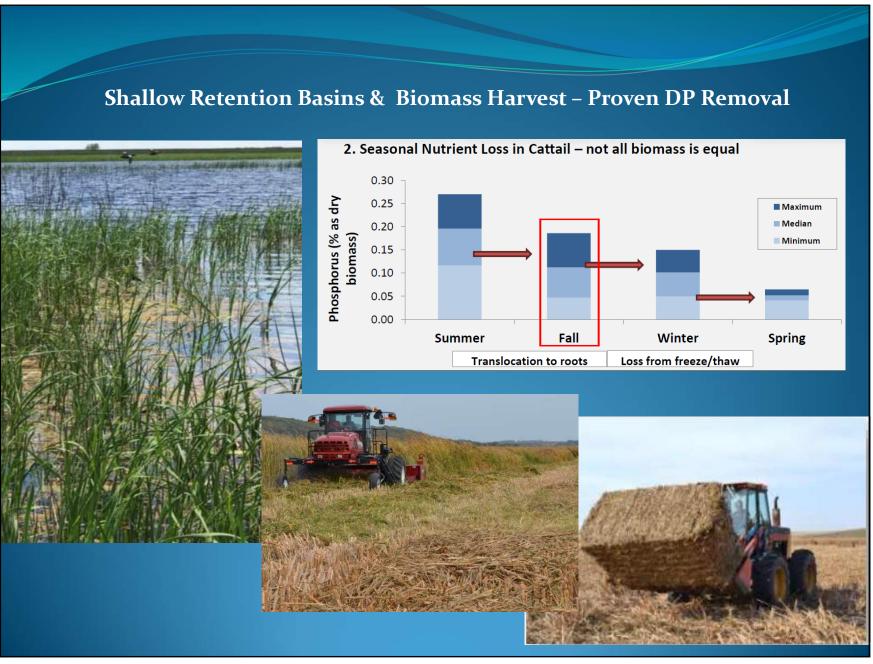
Any conservation practice that increases crop field residue or perennial vegetation is likely to increase DP in spring runoff....research in Manitoba on no-till, cover crops largely bears that out.

Nutrient management should be effective, in the long term....

- Unlike most of the country, trapping sediment in the RRB does not trap dissolved P
- During the growing season, vegetation in filter strip may uptake P...given the opportunity time
- Dead vegetation in buffer contributes additional DP in spring floods
- Red River research indicates highly variable results: 500% increase to 40% reduction range

Non-growing Season

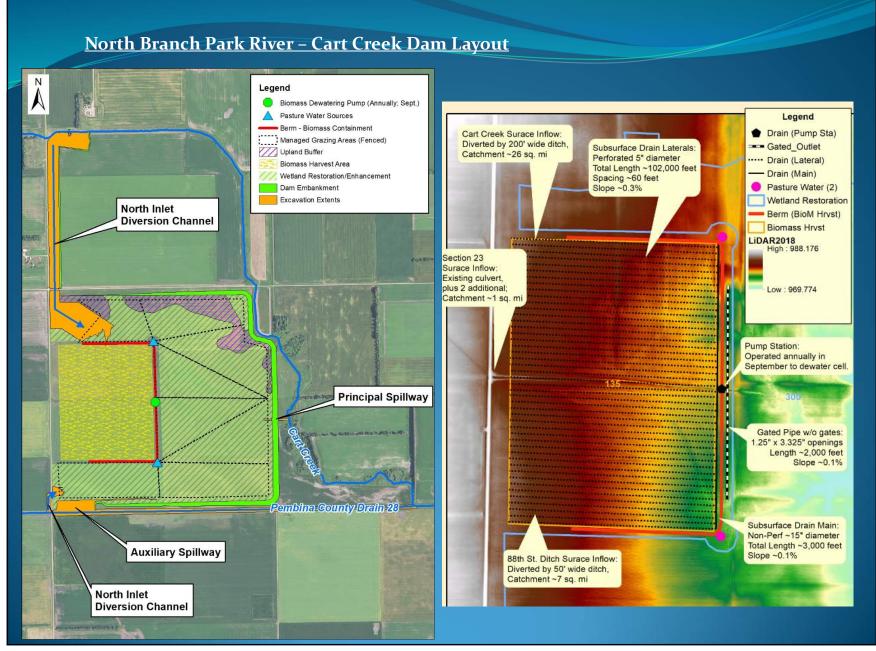




Proven Strategy: Shallow Retention w/ Biomass Harvest – North Ottawa Project (MN)

- 75 square mile drainage area
- 16,000 ac-ft retention structure SE of Fargo
- 1,920 acres, 8 interior cells
- 1 cell dedicated to biomass harvesting, U. of Minnesota monitoring/modeling showed that with ideal timing of fall harvest, 100% incoming DP removal would occur at a ratio of <u>4 acres of</u> <u>biomass harvesting cell to 1 sqmi</u> <u>drainage area</u>
- Harvest issues in some years due to inability to effectively drain
- Sponsor would prefer to grow and harvest something other than cattails





Quantifying WQ Improvements

- Total load to the dam estimated by:
 - ✓ USGS gauge data
 - ✓ Regional averages
 - ✓ PTMapp regional water quality model
- Reductions estimated based on N Ottawa research data
- First order loss equations utilized to estimate nutrient and sediment delivery ratios to downstream locations in the overall watershed.

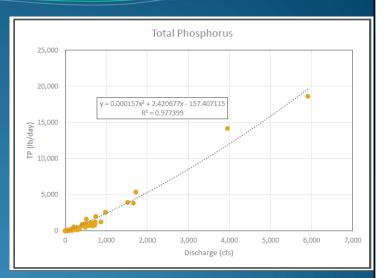
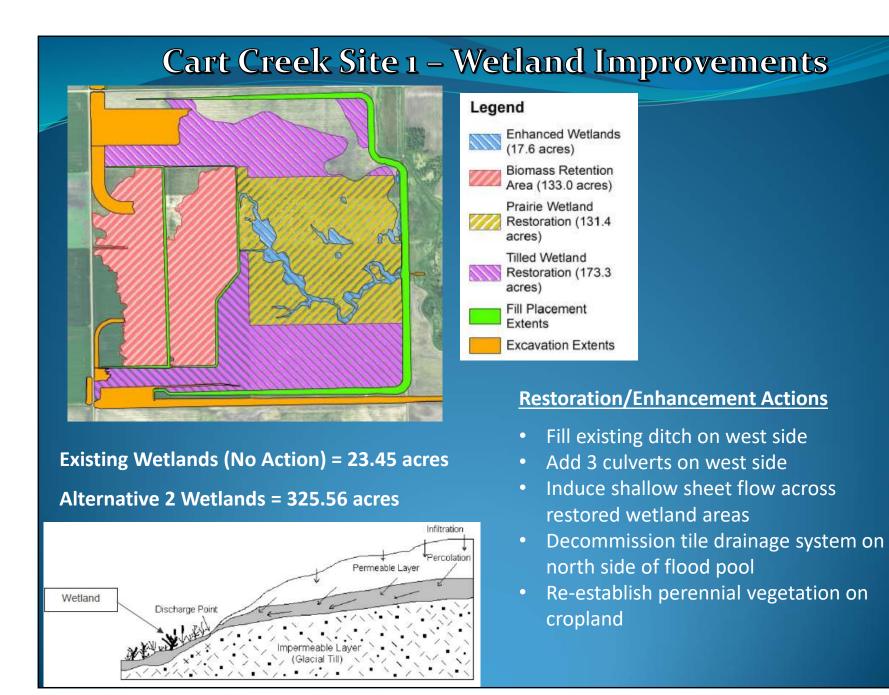
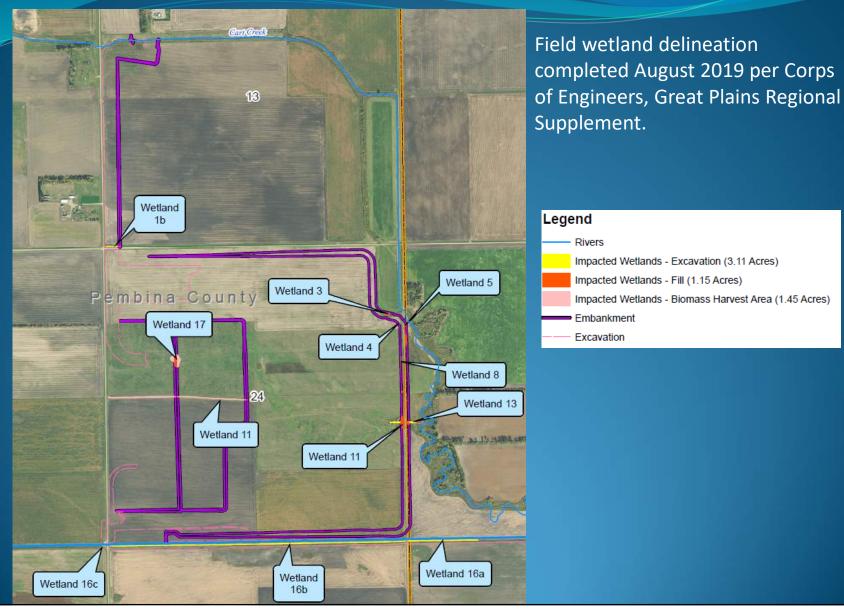


Table 2: Annualized Nutrient Reduction at Cart Creek Site 1									
Parameter	Incoming Nutrient/Sediment Delivery % Reduction (Guzner, 2017)		Nutrient/Sediment Loading Retained within the Site	Nutrient/Sediment Loading Leaving the Site					
Total Phosphorus (lb/year)	8,499	66%	5,609	2,890					
Total Nitrogen (lb/year)	46,106	73%	33,657	12,449					
Total Suspended Solids (ton/year)	1,845	42%	775	1,070					



Cart Creek Site 1 – Negative Wetland Impacts



Cart Creek Site 1 – Wetland Improvements

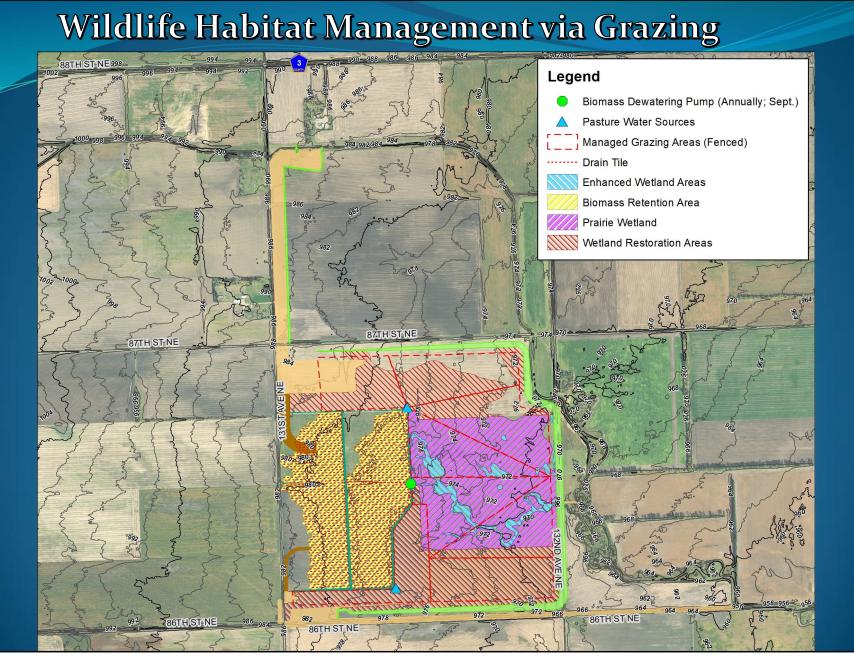
Table 4: Summary of Wetland Acreages						
	Existing and	Alternative 2	Gain (+) or			
	No-Action Conditions	Condition	Loss (-)			
Wetland Area	(Acres)	(Acres)	(Acres)			
1b	1.14	1.13	-0.01			
3	0.06	0.00	-0.06			
4	0.19	0.19	0.00			
5	0.55	0.38	-0.17			
7	0.17	0.17	0.00			
8	1.21	1.16	-0.05			
9	1.86	1.86	0.00			
10	0.18	0.18	0.00			
11	15.76	14.15	-1.60			
12	0.06	0.06	0.00			
13	1.68	1.59	-0.09			
17	0.60	0.00	-0.60			
Restoration of Tilled Land	0.00	173.28	173.28			
Restoration of Prairie Land	0.00	131.40	131.40			
Total	23.45	325.56	302.11			

Net gain = 302 acres of wetlands

Significant improvements to wetland function, per Hydrogeomorphic Model



Table 5: Composite Wetland Function Gaines and Losses							
Function	Description	Existing and No-Action Conditions (FCU)	Alternative 2 Condition (FCU)	Functional Gain (+) or Loss (-) (FCU)			
Moderation of Groundwater Flow	the capacity of the wetland to regulate the outflow of groundwater	228.39	402.72	+174.33			
Velocity Reduction of Surface Water Flow	the reduction in the velocity of surface water movement through the wetland from storm events and/or snowmelt runoff	197.39	428.86	+231.48			
Elemental and Nutrient Cycling	short- and long-term cycling and removal of elements and compounds on site through the abiotic and biotic processes that convert elements from one form to another	138.57	285.77	+147.19			
Retention of Particulates and Organic Matter	deposition and retention of inorganic and organic particulate (>45 um) from the water column, primarily through physical processes	195.59	366.35	+170.76			
Organic Carbon Export	export of dissolved and particulate organic carbon and detritus from the wetland	261.65	450.16	+188.51			
Maintenance of Characteristic Plant Community	species composition and physical characteristics of living plant biomass	219.63	454.33	+234.69			
Maintenance of habitat interspersion and connectivity among wetlands	the spatial relationship of an individual wetland with respect to adjacent wetlands in the complex	197.67	361.56	+163.89			



Original Scoping Meeting to address National Environmental Policy Act (NEPA Concerns)

Public Meeting Held February 17, 2016
 Cooperating Agencies invited (USFWS, USACE, EPA)
 Tribal Consultation initiated November 5, 2018 with 31 tribes & SHPO
 15 comments received (letters or comment forms) from the public, no tribal comments

Upgrade from Environmental Assessment (EA) to Environmental Impact Statement (EIS) necessitated an additional scoping window

https://www.nrcs.usda.gov/conservation-basics/conservation-by-state/northdakota/north-branch-park-river-watershed

National Environmental Policy Act (NEPA Concerns)

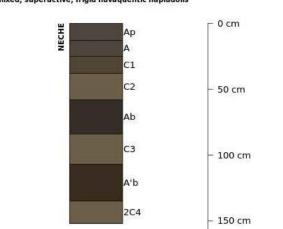
- Soils
 - Erosion
 - Prime Farmland
- Water
 - Water Quantity
 - Water Quality
 - Aquatic Resources
 - FEMA Floodplain Management
- Habitats
 - Natural Areas
 - Historical and Current Habitats

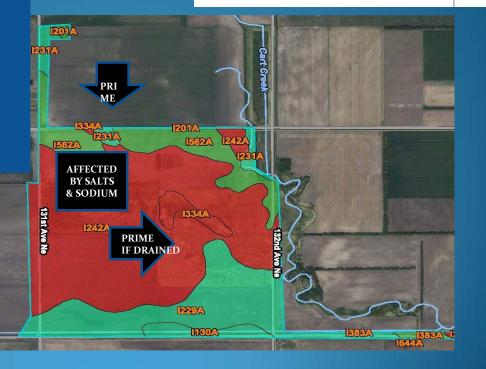
- Plants and Animals
 - State Conservation Priority Species
 - Threatened and Endangered Species
 - Migratory Birds
 - Undesirable Species
- Human Environment
 - Land use
 - Environmental Justice
 - Cultural Resources
 - Public Health and Safety
 - Recreational Resources

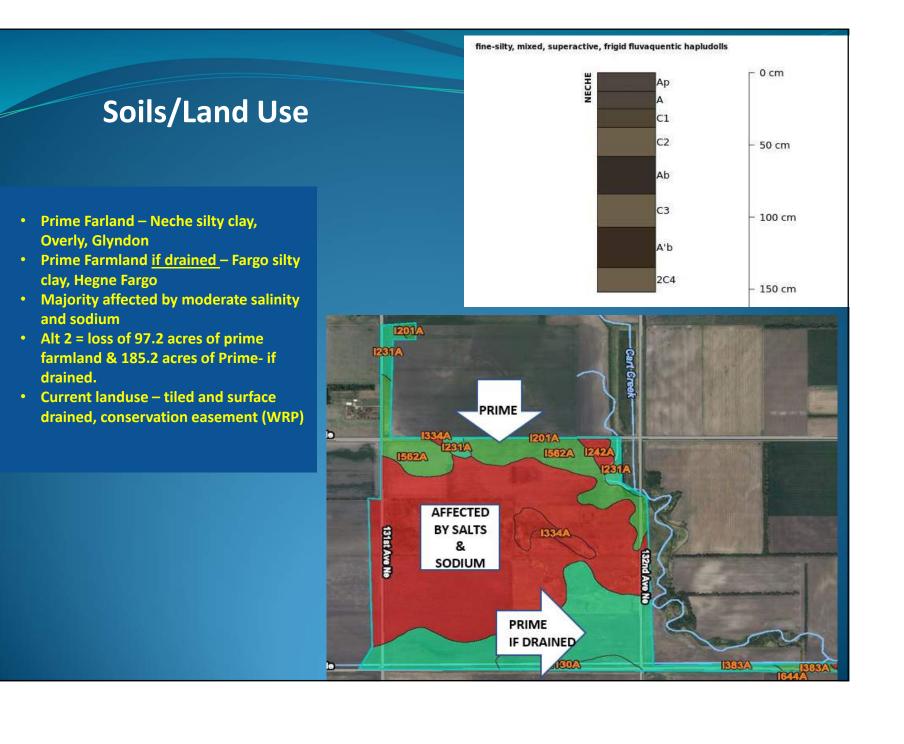
Soils/Land Use

fine-silty, mixed, superactive, frigid fluvaquentic hapludolls

- Prime Farmland Neche silty clay, Overly, Glyndon
- Prime Farmland <u>if drained</u> Fargo silty clay, Hegne Fargo
- Majority affected by moderate salinity and sodium
- Alt 2 = loss of 97.2 acres of prime farmland & 185.2 acres of Prime- if drained.
- Current landuse tiled and surface drained, conservation easement (WRP)



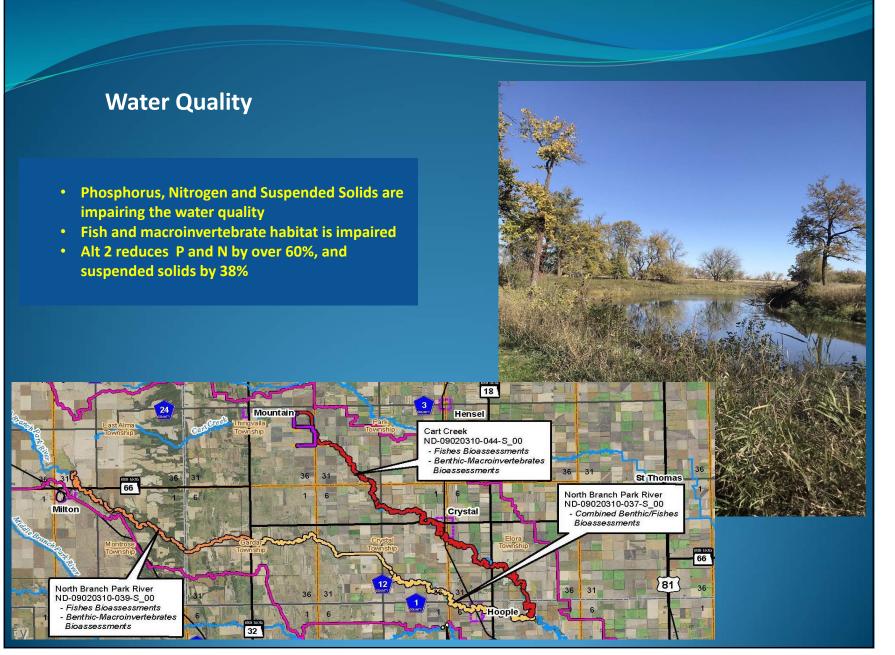




Water Quantity/ Public Heath and Safety

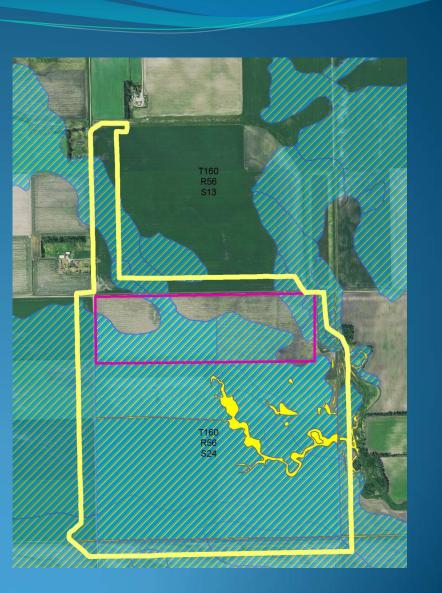
- Current Conditions channel instability, channel erosion, sediment deposition, flooding affecting city of Crystal, roads, buildings, structures.
- Alt 2 flood relief from decreased and regulated flows, reductions in peak flow at roads and City of Crystal.
- Base hydrology of river is maintained – all flows up to the 2year event will flow through the original water courses.
- No de-watering of river





Aquatic Resources

- Wetlands
 - Historically most of the area was hydric soil
 - Existing Wetland Acres = 23.45 ac
- Alt 2 = gain of 302.11 acres of hydrology
- 139 Acres of Biomass Harvest area will provide wetland wildlife habitat albeit of lower quality.
- Quality of wetland riparian habitat improved in areas not impacted by retention structures



ND Game and Fish Species of Concern

- Plants: 8 Level I ND Plant Species are present, 2 of these are rare (wooly milkweed, and Cooper's milkvetch)
- Birds/Mammals: 15 Potentially present Level I ND species of concern
- Level I fish species Northern Pearl Dace potentially present, not observed.
- Park River Watershed is known habitat for 24 ND species of concern – levels I-III.
- Alt 2 = 228 acres of high-quality habitat is preserved, 312 acres of perennial mixed upland/wetland habitat added– providing habitat for upland nesting waterfowl and prairie birds and mammals.



Federally Threatened and Endangered Species



Prairie landscape – no mature trees present

Federally Threatened and Endangered Species

- Northern Long-Eared Bat (Endangered)
 - Concern with White Nose Syndrome fungal disease
 - No known critical habitat, hibernaculum or maternity trees in ND
 - Very few trees or other structures are present for potential habitat.
 - Recently upgraded from Threatened to Endangered
- Whooping Crane (Endangered)
 - May be transient
 - Construction ceases with observation
- Monarch Butterfly potential habitat gain
- Alt 2 = not likely to result in regeneration of large woody vegetation suitable for NLEB habitat
- No disturbance in existing wildlife habitat easements
- May need to run IPAC before final EIS.



Cultural Resources

- Class I Survey (literature search) completed in 2020
- Class III Survey (in field) conducted 2020 and 2021
 - 31 Tribal Governments and ND State Historic Preservation Officer in process of consultation
 - NRCS recommendation of "No Effect" to Historic Properties
 - Old farmhouse area ground disturbance is profound, recommend no further disturbance in that area.
- Alt 2 = Stabilized river channel will potentially preserve any potential cultural resources in place.
- Worker awareness and response training required.



Estimated Timeline

December 18, 2022, Notice of Intent to prepare an EIS published to Federal Register

March 18, 2023, Tribal consultation on Class III Survey complete

March 23, 2023, Deadline for public comments from today's scoping meeting

April 18, 2023, SHPO Consultation on Class III complete

April/May 2023 – NRCS will post final Draft Plan/EIS to our website and submit Notice of Availability (NOA) of Draft Plan/EIS to EPA; 45-day public comment period begins after published by EPA

April/May 2023 – Virtual Public Meeting to review the final Draft Plan/EIS - Formally request comments from cooperating agencies, final tribal consultation.

Final comments incorporated into FINAL Plan/EIS – uploaded to NRCS website

NRCS submits Notice of Availability (NOA) of FINAL Plan/EIS to EPA; 30 day comment period begins after published by EPA

ROD (Record of Decision) – published on our website, plan forwarded to NHQ for authorization

Scoping Comments:

In person, or over Teams, at the meeting today.

In person, in the future: Rita Sveen, Watershed Planner USDA-NRCS Park River Field Office 417 Park Street, Park River 701-284-7771 x124

By email: <u>christi.fisher@usda.gov</u>

By mail: Christi Fisher, State Conservation Engineer USDA- Natural Resource Conservation Service 220 E Rosser Ave, Rm 270 Bismarck, ND 58502-1458



United States Department of Agriculture