



Wyoming Depletions Report

Water Year 2018

Water Year 2018

▶ Baseline No. 1:

- Complied with the Modified North Platte Decree (01/15/2019 letter)
- 178,890 acres irrigated (226,000 acre cap)

▶ Baseline No. 2:

- Irr. Season–67,917.37 acre–feet underrun
- Non–Irr. Season–4,808.65 acre–feet underrun

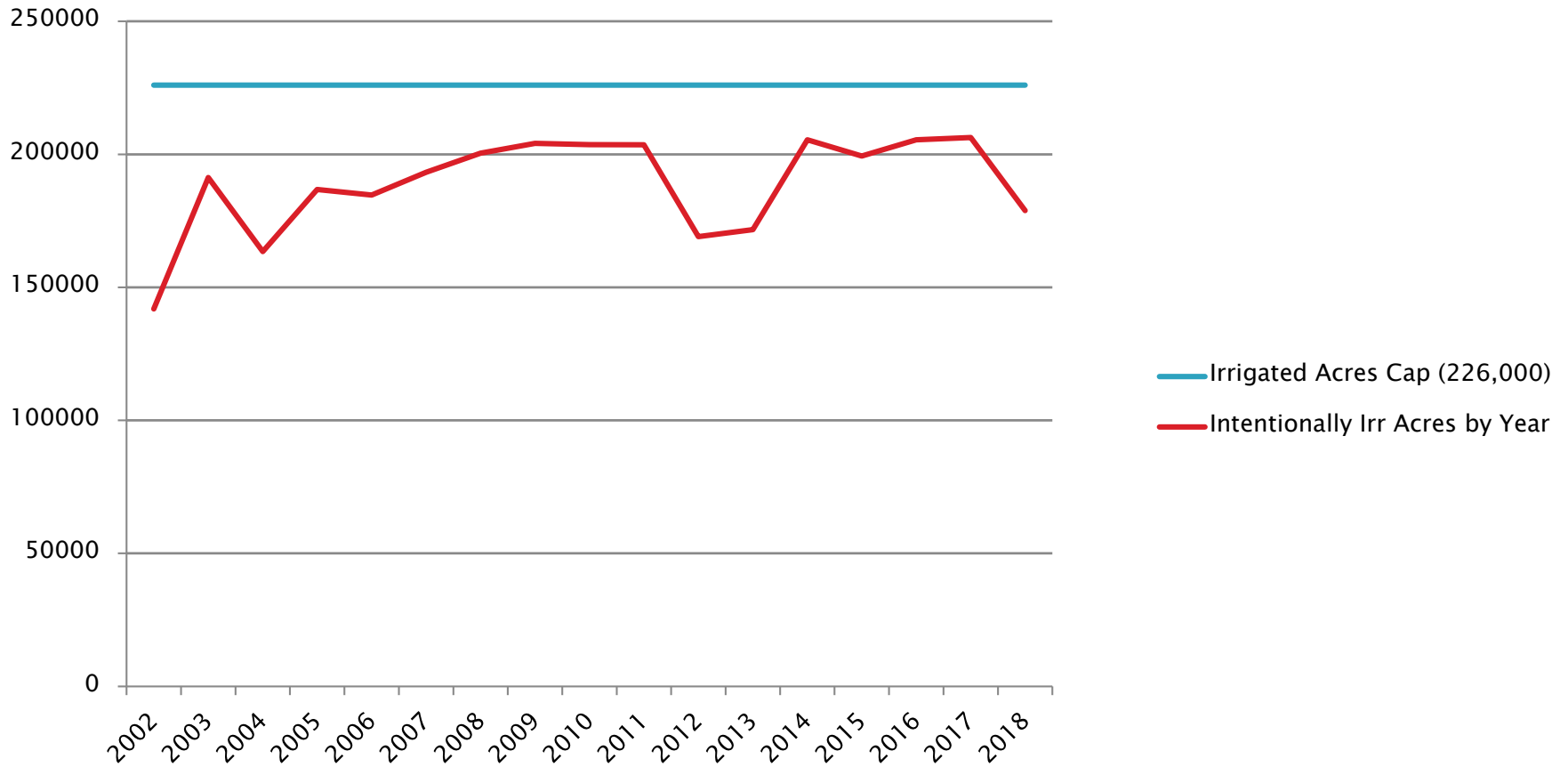
▶ Baseline No. 3:

- South Platte Storage–179.32 acre–feet ***

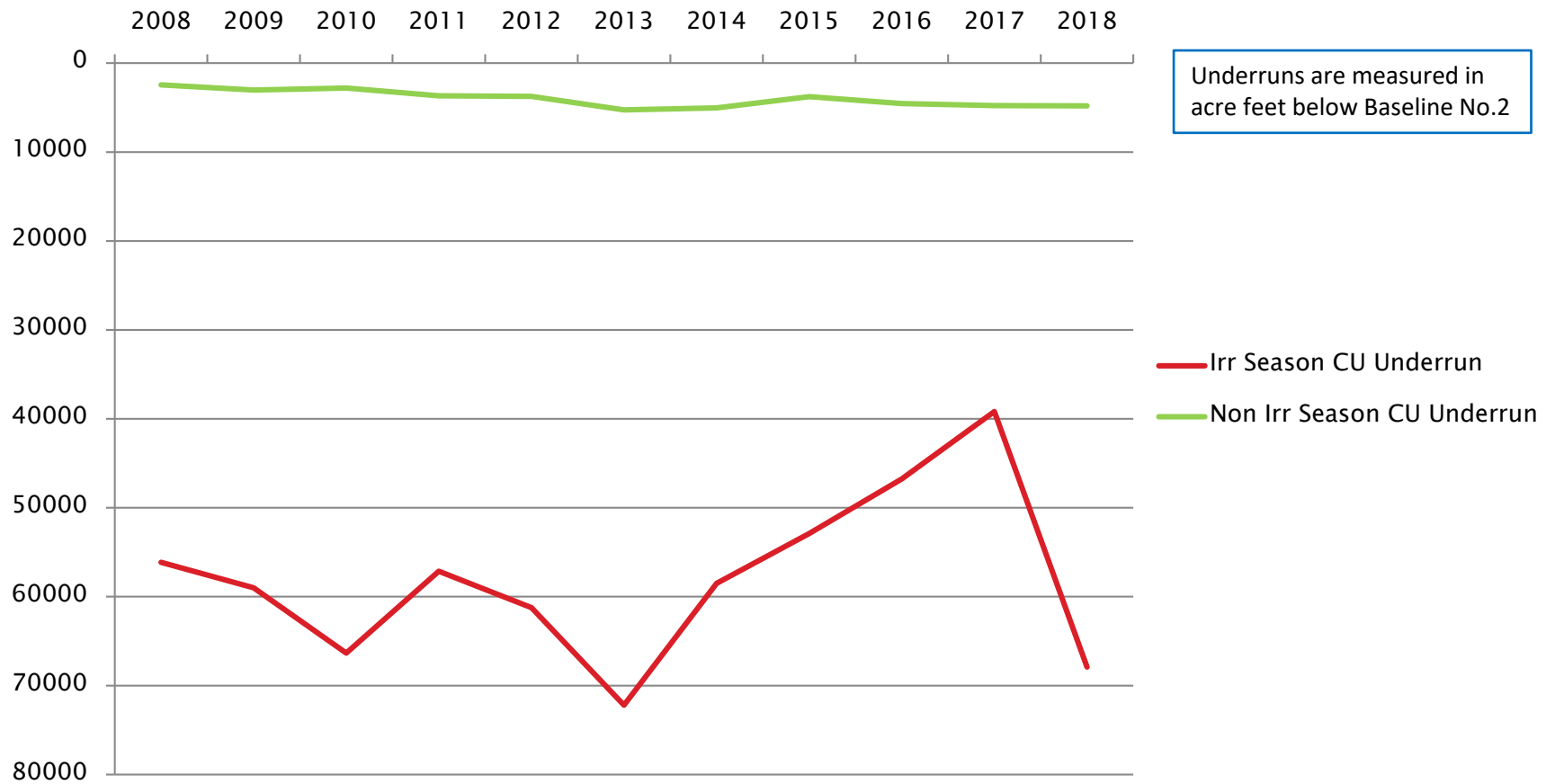
Looking Forward

- ▶ Platte River Issues in Wyoming
 - Wyoming is re-installing gauge housing and instrumentation at 2 of the Big 11 Reservoirs (King #1 and Dutton). Once installed this will save hundreds of miles of driving each year to inspect reservoir levels.

Historic Numbers



Continued...



Questions or Concerns?



Nebraska New Depletion Plan Update

PRRIP Water Advisory Committee Meeting
May 7, 2019

Jessie Winter Strom, Integrated Water Management Coordinator

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Update on Nebraska's New Depletion Plan

2017 Permitted Activities

Non-permitted Activities

Estimated Depletions

Offsets and Accretions

Basin-Wide Plan Activities

2017 Permitted Water Uses

Permits issued by the NRDs and the Department

Type	Total
Groundwater Transfers	47
Groundwater Wells	41
Groundwater Variances	2
Surface Water Permits	19

2017 Groundwater Transfer Permits

	Upstream of CHR	Within CHR	Total
Groundwater Transfers	29	18	47

2017 Groundwater Well Permits

Type	Upstream of CHR	Within CHR	Total
Industrial	6	1	7
Supplemental Groundwater	4	1	5
Replacement	16	9	25
Transfer/New Well	3	0	3
Public Water Supply	1	0	1
Total	30	11	41

2017 Groundwater Variance Permits

Type	Upstream of CHR	Within CHR	Total
Acre Correction	0	1	1
Other*	0	1	1
Total	0	2	2

*Variance to well abandonment requirement

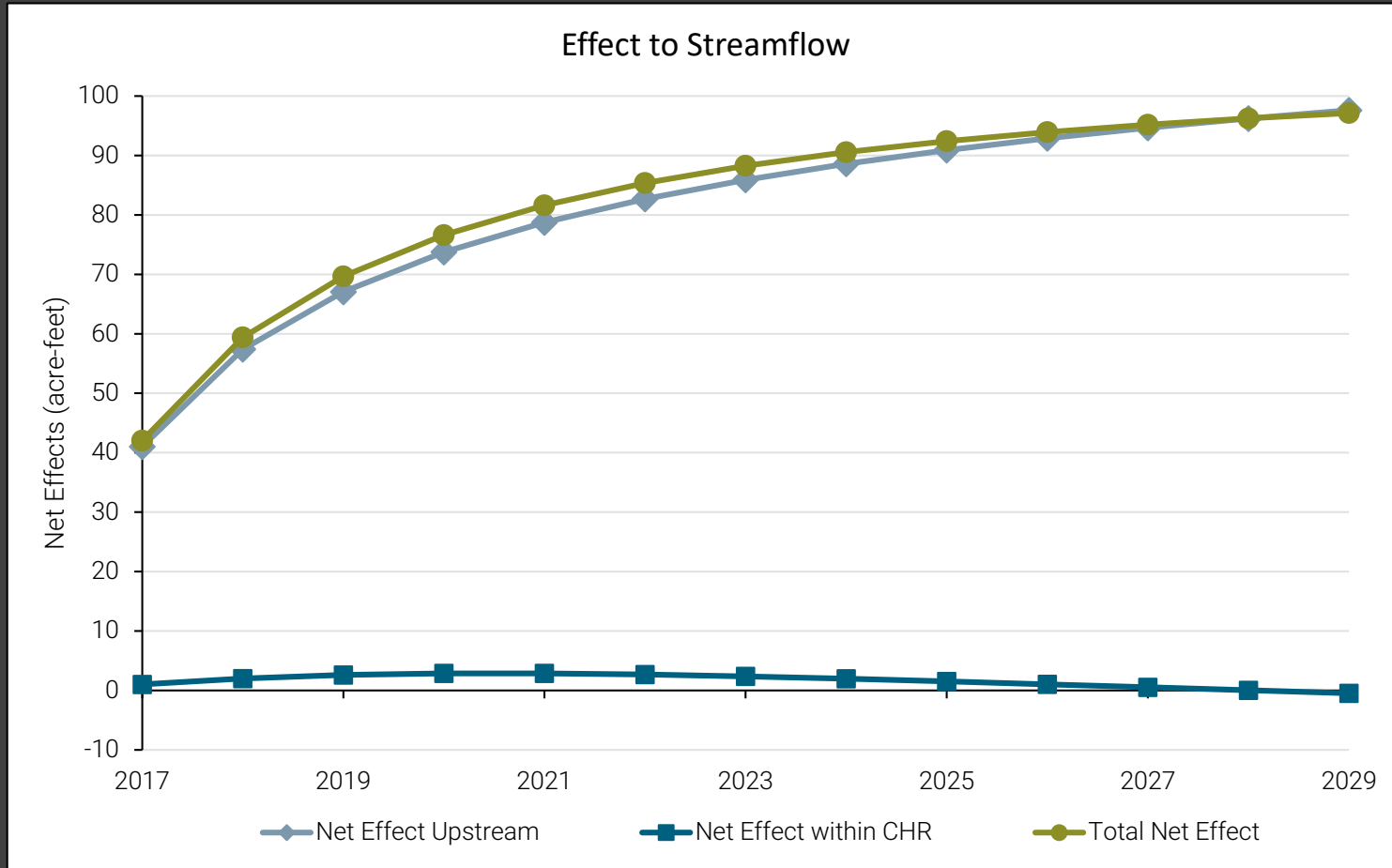
2017 Surface Water Permits

Type	Upstream of CHR	Within CHR	Total
Recharge (Temporary)	19	0	19
Recharge (Permanent)	0	0	0
Construction (Temporary)	0	0	0
Total	19	0	19

Effects to Streamflow from 2017 Permitted Activities

Year	Upstream of CHR			Within CHR			Both Reaches
	New Uses	Mitigations	Net Effect	New Uses	Mitigations	Net Effect	Net Effect
2017	-24.56	65.58	41.03	-13.25	14.26	1.01	42.04
2018	-38.40	95.80	57.40	-21.37	23.36	2.00	59.40
2019	-47.29	114.37	67.07	-27.08	29.68	2.60	69.67
2020	-53.65	127.39	73.75	-31.52	34.38	2.87	76.61
2021	-58.49	137.24	78.74	-35.19	38.06	2.87	81.62
2022	-62.35	145.04	82.69	-38.36	41.05	2.68	85.37
2023	-65.52	151.42	85.90	-41.16	43.52	2.37	88.27
2024	-68.19	156.79	88.60	-43.66	45.63	1.96	90.56
2025	-70.47	161.37	90.90	-45.93	47.44	1.51	92.41
2026	-72.46	165.36	92.90	-48.00	49.03	1.03	93.93
2027	-74.21	168.86	94.66	-49.90	50.43	0.53	95.18
2028	-75.76	171.98	96.22	-51.66	51.68	0.02	96.24
2029	-77.16	174.77	97.61	-53.28	52.81	-0.48	97.14

Net Effect to Streamflow from 2017 Permitted Activities



Effects to Streamflow from 2006-2017 Permitted Activities

Year	Upstream of CHR			Within CHR			Both Reaches
	New Uses	Mitigations	Net Effect	New Uses	Mitigations	Net Effect	Net Effect
2006	-9	25	15	-206	4	-202	-187
2007	-25	66	41	-11	15	4	45
2008	-84	180	95	-31	38	7	102
2009	-190	377	187	-60	55	-5	182
2010	-285	522	237	-94	124	30	268
2011	-386	733	347	-131	159	28	375
2012	-509	993	484	-172	197	25	509
2013	-683	1,249	566	-230	245	15	582
2014	-832	1,488	656	-293	305	10	666
2015	-1,004	1,721	717	-355	356	1	717
2016	-1,051	1,812	761	-367	373	6	766
2017	-1,156	2,022	886	-399	413	14	879
2018	-1,298	2,299	1,001	-444	468	23	1,023
2019	-1,466	2,620	1,154	-499	532	33	1,185

Other Basin-Wide Activities

Robust Review is complete

- Uses WWUM and COHYST 2010

- Presenting results at August WAC meeting

Development of Second Increment Upper Platte Basin-Wide Plan and IMPs

- Ten year increments

- BWP stakeholder process – meetings finished in September 2018

- IMP stakeholder process – started in August 2018, wrapped up in March 2019

- All plans will be in place by September

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2018 PRRIP Water Projects Accounting

PRRIP Water Advisory Committee
May 7, 2019

Background

- EDO produced annual Phelps Recharge Reports through 2016-2017
- New Accounting Memo
 - Replaces individual Phelps report
 - 2018 operations
 - Comprehensive accounting since projects began
 - Extensive appendices
 - Compiles permits, WSAs, invoices, etc.
 - To be updated annually



Score vs Operational Yield

- Score
 - ▣ Planning tool
 - ▣ OPSTUDY hydrology, 1947-1994
 - ▣ Annual hydrologic condition
 - ▣ Assumed project operations
- Operational yield
 - ▣ First Increment hydrology, 2007-2018
 - ▣ Real-time hydrologic condition
 - ▣ Actual project operations
- Inherent differences, should not expect matching results

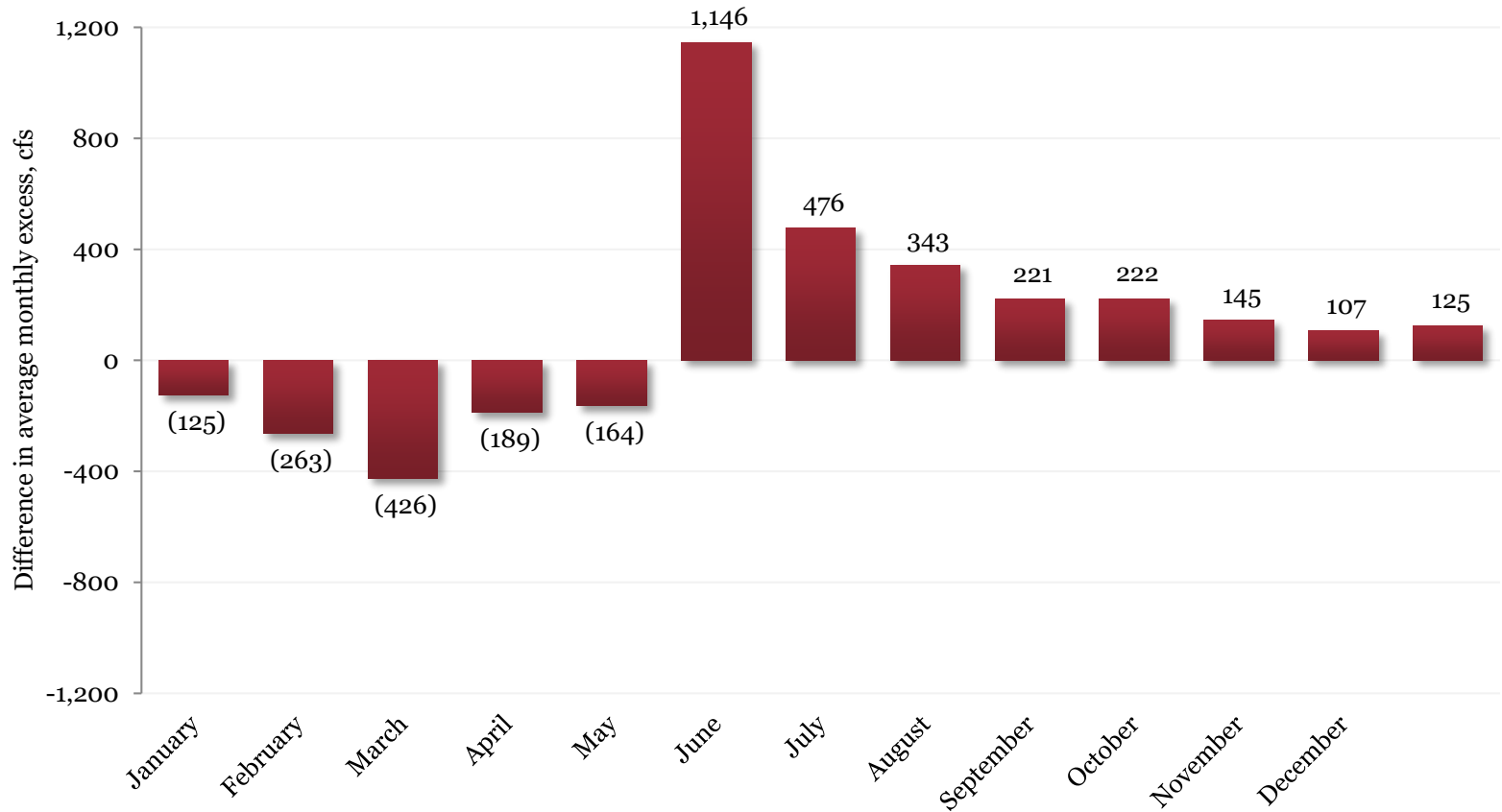


Score vs Operational Yield

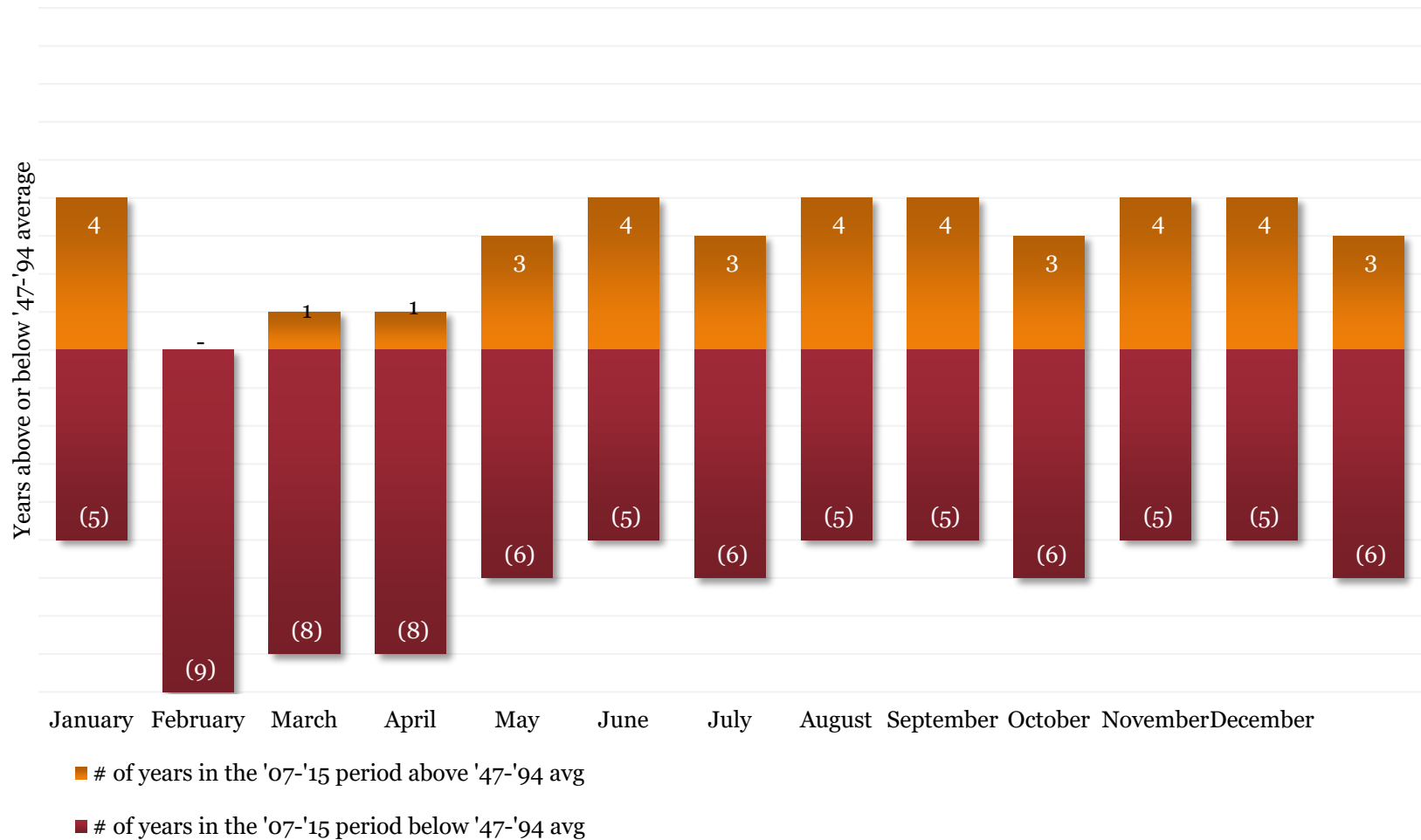
- Time
 - ▣ Scores based on 48-year averages + negotiation
 - ▣ Program water projects operating at most 12 years, most less
 - ▣ Recharge accretions lag diversions by months or years
 - ▣ Eventual steady state, but not there
 - ▣ Cannot draw conclusions about long-term performance
- Reduced availability of excess flows
 - ▣ 2016 EDO white paper
 - ▣ Overall average skewed high by just a few high flow months
 - ▣ January-May excess availability less than historical (125-426 cfs)
 - ▣ Affects multiple recharge projects



First Increment Excess Availability

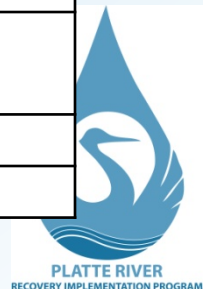


First Increment Excess Availability



Program Water Projects in 2018

Project	First Year of Operation	Number of Years of Operation
State Water Projects		
Tamarack I	2007	12
Lake McConaughy EA	2007	12
Pathfinder EA	2012	7
Water Action Plan Projects		
No-Cost NCCW	2007	12
Phelps County Canal Groundwater Recharge	2011	8
Pathfinder Municipal Account Lease	2012	7
Elwood Reservoir Recharge	2015	4
CPNRD Recharge (Thirty Mile, Cozad, and Orchard-Alfalfa canals)	2015	6
NPPD Recharge (Gothenburg and Dawson County canals)	2015	4
Cook Recapture Well (effectively part of the Phelps recharge project)	2016	3
CNPPID Irrigator Lease	2016	3
CPNRD Pilot Exchange Project (Surface Water Lease)	2018	1



Program Water Projects in 2018

- ❑ Excess flows diverted for recharge
- ❑ Storable Natural Inflows (SNI) credited to Lake McConaughy EA
- ❑ Water credited to Lake McConaughy after irrigation season



Accounting Process

- Recharge
 - ▣ Excess diversions routed using groundwater model or unit response functions
 - ▣ WMC Loss Model routing from point of return to Grand Island
 - ▣ Compare against shortages at Grand Island
- Lake McConaughy EA
 - ▣ Six sources become one
 - ▣ Evap, seepage, reset losses from storage
 - ▣ Releases routed to Grand Island based on PWAP results from NDNR
 - ▣ Compare against shortages at Grand Island



Groundwater Recharge - 2018

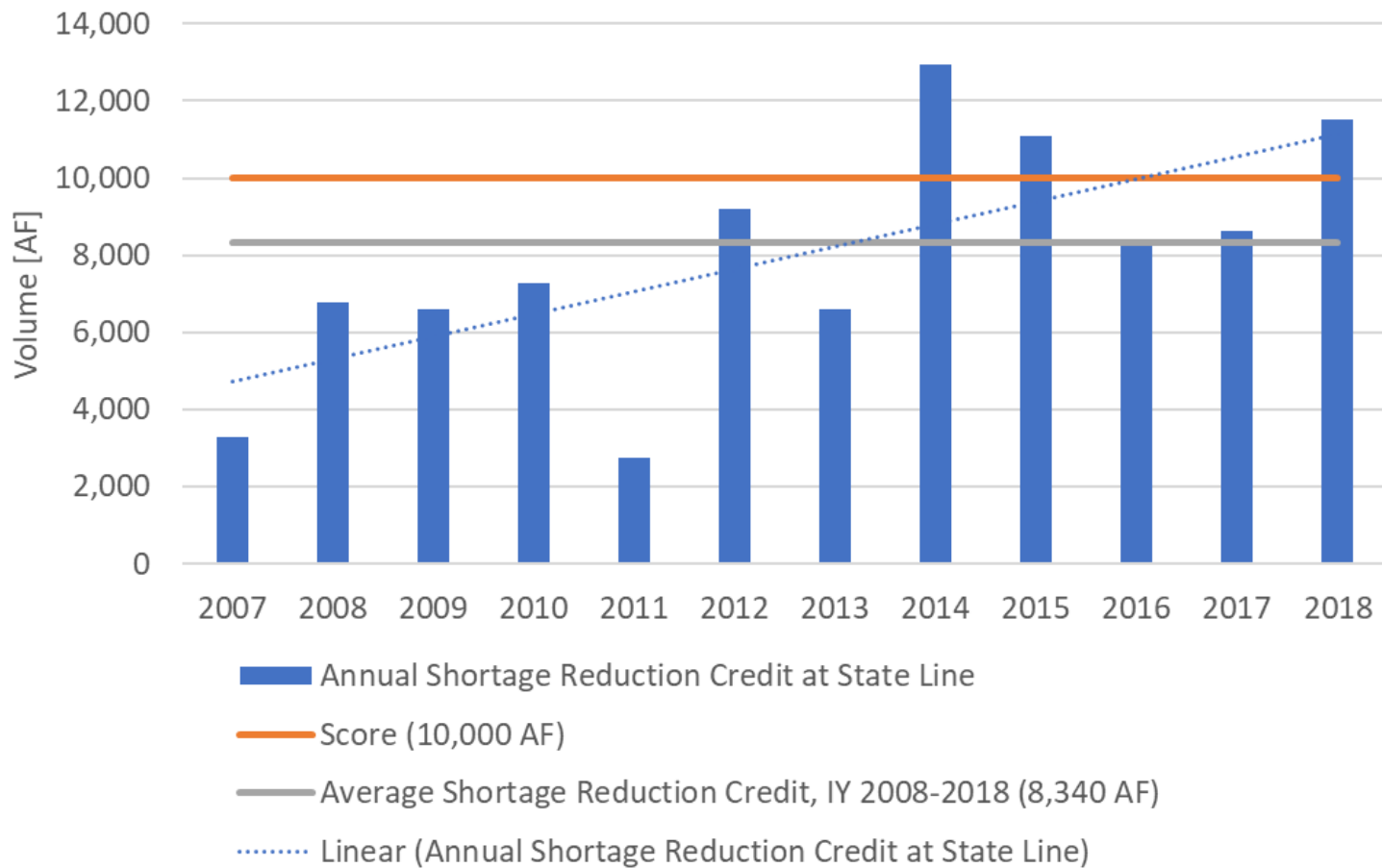
Project	Project Type	Diversions [AF]	Recharge [AF]	Total Accretions at Point of Return [AF]	Total Accretions Reaching Grand Island [AF]	Shortage Reduction Credits at Grand Island [AF]
Tamarack I	State	27,610		23,250		10,350*
Phelps County Canal Groundwater Recharge	WAP	3,258	TBD	TBD	TBD	TBD
Elwood Reservoir Recharge	WAP	14,916	8,200	2,000	1,700	1,000
CPNRD Canal Recharge	WAP			1,866**		
NPPD Canal Recharge	WAP	3,346	2,701			

* Tamarack I shortage reduction credits = 11,510 AF at state line

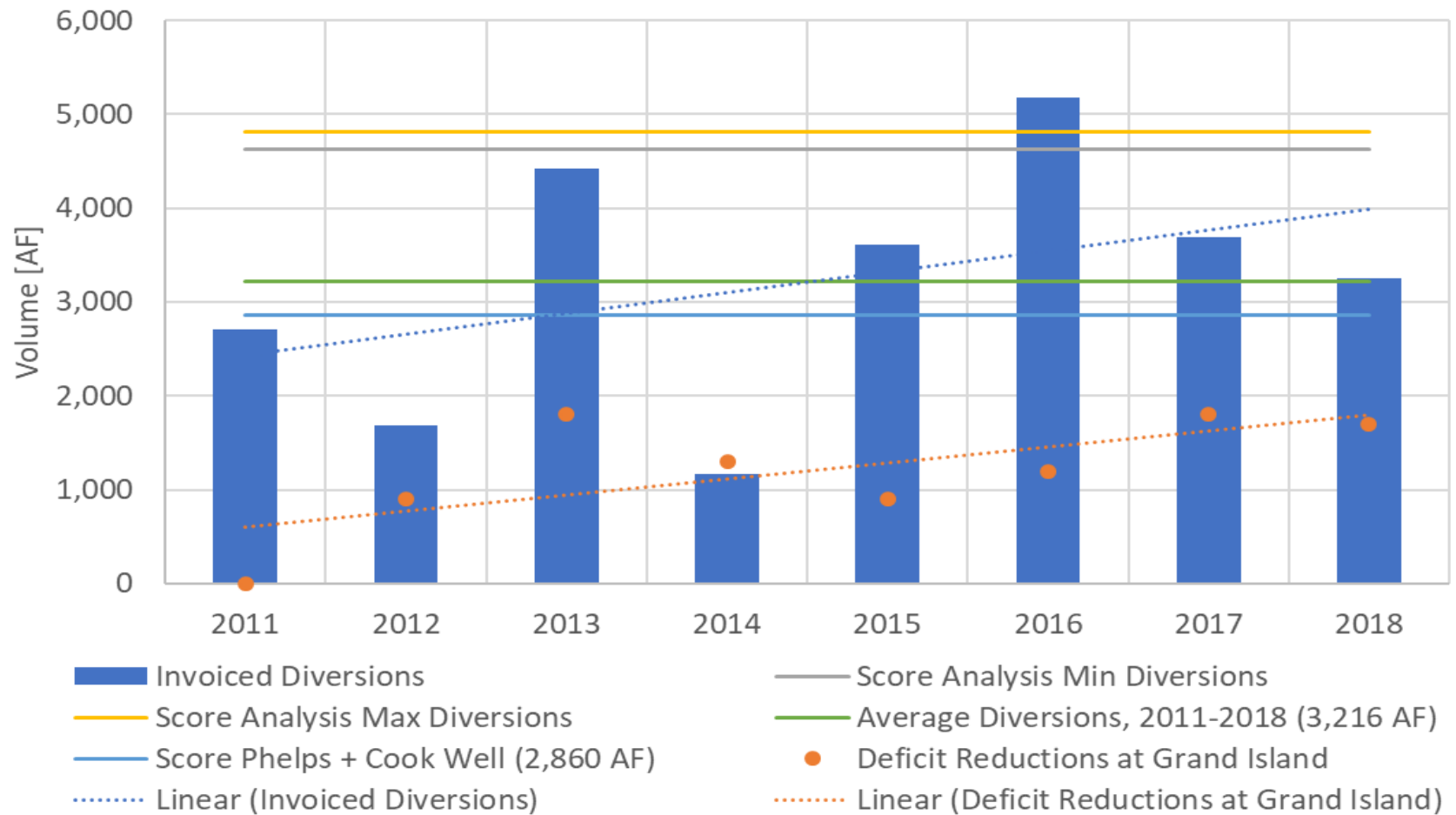
** No CPNRD recharge diversions in 2018, accretions are projection from 2017 analysis.



Tamarack I



Phelps Recharge



* Program gets 75% of diversions/yield (originally 50%)

Elwood Recharge

- Four years of operations, 2015-2018
- Located ~8 miles from river
- Total diversions = 44,100 AF
- Still in reservoir = 17,300 AF
- Evap = 2,300 AF
- Seepage = 24,600 AF
 - Lagged accretions to Platte = 4,200 AF
 - Still in aquifer or Republican basin = 20,400 AF
- Recommended score = 2,800 AF
 - Average shortage reduction credit = 460 AF, but increasing every year



CPNRD Recharge

Invoiced Accretions

Year	Thirty Mile (AF)	Cozad (AF)	Orchard- Alfalfa (AF)	Combined (AF)
2013	491	145.9	339	975.9
2014	850	83	215	1,148
2015	796	204	639	1,639
2016	892	308	620	1,820
2017	1,583	306	488	2,377
2018	1,282	251	333	1,866
Total	5,900	1,300	2,600	9,800
Average	980	220	440	1,640



NPPD Recharge

Diversions and Net Recharge

Season	Gothenburg Canal		Dawson County Canal	
	Diversion (AF)	Net Recharge (AF)	Diversion (AF)	Net Recharge (AF)
Fall 2015	1,609	1,525	3,303	2,845
Spring 2016	0	0	1,397	1,309
Fall 2016	6,019	4,653	5,628	3,471
Spring 2017	0	0	0	0
Fall 2017	0	0	4,040	3,594
Spring 2018	0	0	0	0
Fall 2018	680	617	2,666	2,084
Total	8,307	6,795	17,033	13,303
Spring Average	0	0	466	436
Fall Average	2,077	1,699	3,909	2,999

Lake McConaughy EA - 2018

Project	Project Type	Upstream Releases [AF]	Credits to EA [AF]	Total EA Releases [AF]	Total EA Releases Reaching Grand Island [AF]	Shortage Reduction Credits at Grand Island [AF]
Lake McConaughy Storable Natural Inflows (SNI)	State	N/A	47,198	89,332	74,600	73,300
Pathfinder EA	State	20,469	17,545			
No-Cost NCCW	WAP	N/A	314			
Pathfinder Municipal Account Lease	WAP	8,100	6,943			
CNPPID Irrigator Lease	WAP	N/A	1,541			
CPNRD Pilot Exchange Project	WAP	N/A	14,251			

Total credits to EA = 87,790 AF



Contributions to Lake McConaughy EA

- Storable Natural Inflows (SNI)
 - 10% of total, October-April
 - Average = 42,700
 - ~400 cfs reduction in non-irrigation season median flows at Lewellen
- Pathfinder EA
 - Average release = 26,100 AF
 - Average reaching Lake Mac = 23,500 AF
- Pathfinder Municipal Account Lease
 - Average release = 7,300 AF
 - Average reaching Lake Mac = 6,600 AF
- No-Cost NCCW = 314 AF most years



CNPPID Irrigator Lease

- Pilot Project, 2016-2018
- New 5-year agreement through 2023
- Increasing participation each year
- Program gets 0.75 AF/acre

Irrigation Season	Acres Enrolled	Volume Credited to Lake McConaughy EA (AF)
2016	1,037	778
2017	1,275	956
2018	2,055	1,541

- 2019 enrollment = 2,948 acres (3,000 acres cap)
- Anticipated to remain consistent



CPNRD Pilot Exchange Project

- 3 canals (Thirty Mile, Cozad, Orchard-Alfalfa)
- Surface transfer, 2015-2017
 - CU estimated, water returned at headgates
 - Low shortage reduction credit compared to volume purchased by Program
- 2018 Pilot Exchange Project
 - 14,251 AF credited to Lake McConaughy EA
 - Pursuing again in 2019



Lake McConaughy EA Accounting

Year	Gross Accruals to EA (AF) ¹	Net Losses (AF) ²	Net Water: Accruals - Losses (AF)	Total EA Releases (AF) ³	Net Yield at GI (AF) ⁴	Reductions to Deficits (AF) ⁵
2007	34,800	17,300	17,500	34,400	24,400	13,000
2008	37,700	17,700	20,000	30,100	17,800	13,600
2009	40,000	9,200	30,800	23,000	13,300	8,200
2010	37,800	8,900	28,900	0	0	0
2011	27,500	47,200	-19,700	0	0	0
2012	68,100	11,100	57,000	81,000	40,900	40,600
2013	57,400	5,400	52,000	74,600	56,100	29,000
2014	82,600	6,400	76,200	45,800	37,600	37,600
2015	88,000	9,300	78,700	51,500	43,500	42,600
2016	87,400	43,700	43,700	23,300	18,200	15,700
2017	95,200	7,500	87,600	142,300	123,300	97,200
2018	87,800	6,000	81,800	89,300	74,600	73,300
Total, 2007-2018	744,300	189,700	554,500	595,300	449,700	370,800
Average, 2007-2018	62,000	15,800	46,200	49,600	37,500	30,900
Total, 2012-2018	566,500	89,400	477,000	507,800	394,200	336,000
Average, 2012-2018	80,900	12,800	68,100	72,500	56,300	48,000

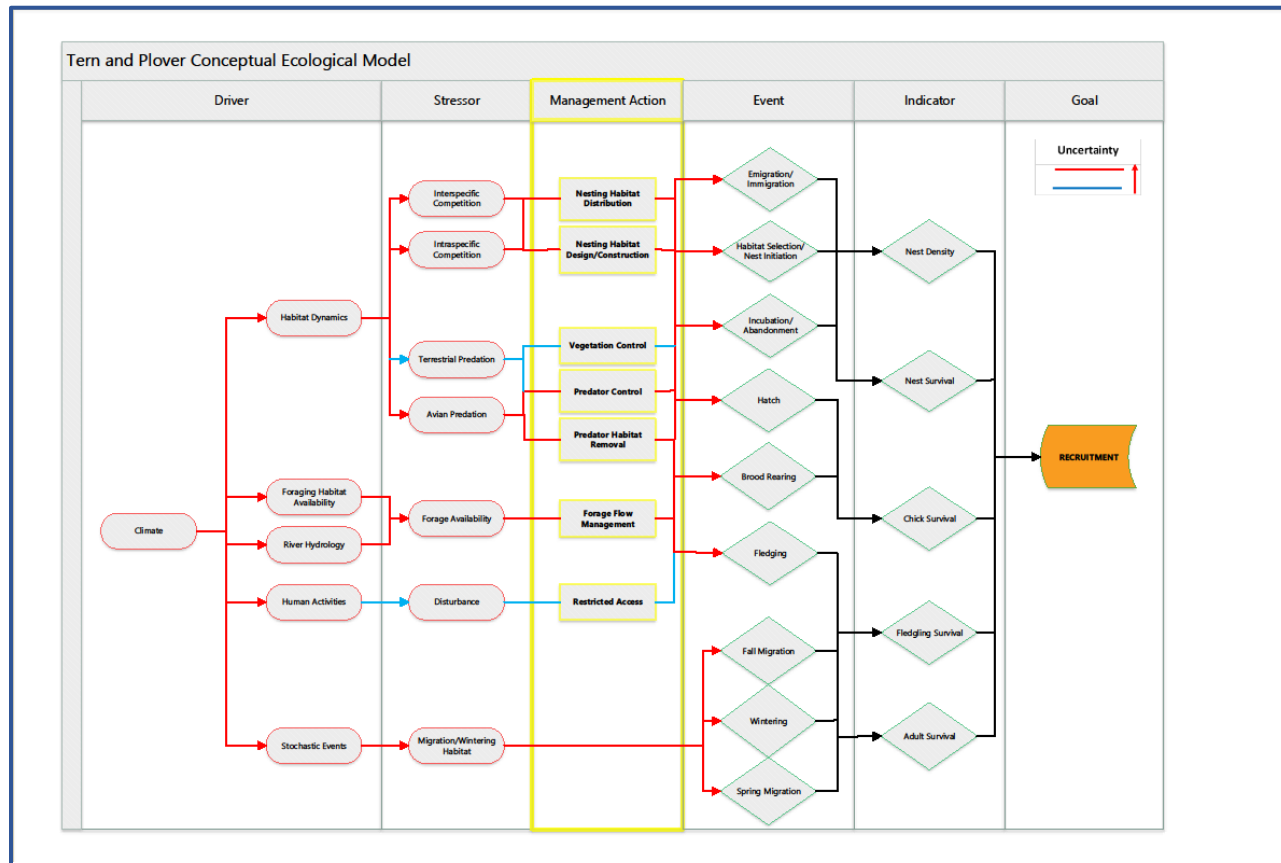
Please provide comments
on draft accounting
memo by:

Tuesday, May 14



Questions?





Adaptive Management Plan Update

Water Advisory Committee

May 7th, 2019



April 30th AMWG Workshop
















Summary of Learning

- 2019 State of the Platte
- Key observations:
 - *Implementation of the FSM management strategy has produced generally poor results.*
 - *Implementation of the MCM management strategy has produced mixed results.*
 - *The target species are responding to the implementation of Program management actions.*
 - *Learning related to pallid sturgeon and the Program has been limited.*
- Big Question assessments and additional learning



April 30th AMWG Workshop

21 **Table 1.** Big Question Assessments, PRRIP First Increment (2007-2019).

PRRIP Big Question	First Increment Assessment	Basis for Assessment
Implementation – Program Management Actions and Habitat		
1. Will implementation of SDHF produce suitable tern and plover riverine nesting habitat on an annual or near-annual basis?		<u>Conclusively answered.</u>
2. Will implementation of SDHF produce and/or maintain suitable whooping crane riverine roosting habitat on an annual or near-annual basis?		<u>Conclusively answered.</u>
3. Is sediment augmentation necessary for the creation and/or maintenance of suitable riverine tern, plover, and whooping crane habitat?		Trending positive and certainty about the sediment deficit in the south channel above the Overton bridge; uncertainty about the role of that deficit in habitat creation and maintenance in the rest of the Associated Habitat Reach (AHR).
4. Are mechanical channel alterations (channel widening and flow consolidation) necessary for the creation and/or maintenance of suitable riverine tern, plover, and whooping crane habitat?		<u>Conclusively answered.</u>
Effectiveness – Habitat and Target Species Response		
5. Do whooping cranes select suitable riverine roosting habitat in proportions equal to its availability?		<u>Conclusively answered.</u>
6. Does availability of suitable nesting habitat limit tern and plover use and reproductive success on the central Platte River?		<u>Conclusively answered.</u>
7. Are both suitable in-channel and off-channel nesting habitats required to maintain central Platte River tern and plover populations?		<u>Conclusively answered.</u>
8. Does forage availability limit tern and plover productivity on the central Platte River?		<u>Conclusively answered.</u>
9. Do Program flow management actions in the central Platte River avoid adverse impacts to pallid sturgeon in the lower Platte River?		This Big Question will either be retained in its current form or revised and addressed through implementation of AMP Version 2.0 during the Extension.
10. Do Program management actions in the central Platte River cumulatively 1) produce detectable changes in the physical environment (i.e. habitat) and 2) result in a detectable increase in tern, plover, and whooping crane use of the Associated Habitats?	<p>LTPP Off-Channel</p> <p>Habitat  Species Response </p> <p>WC On-Channel</p> <p>Habitat  Species Response </p>	<u>Conclusively answered.</u>

AMWG Next Steps:

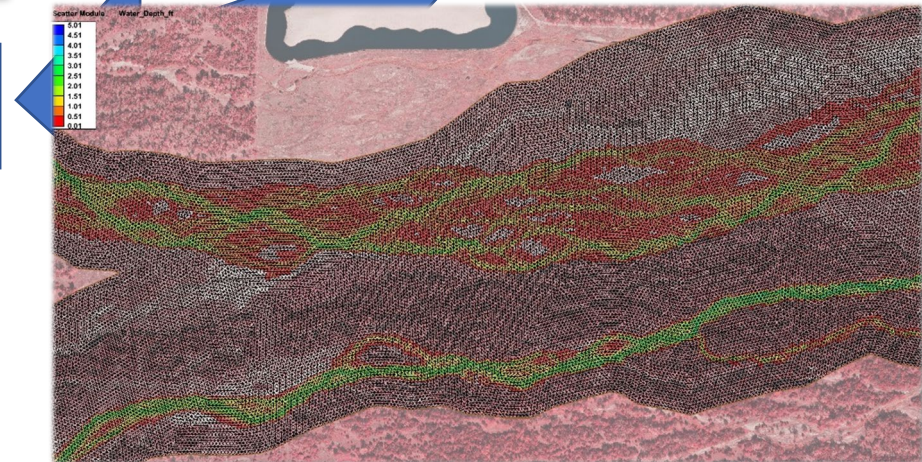
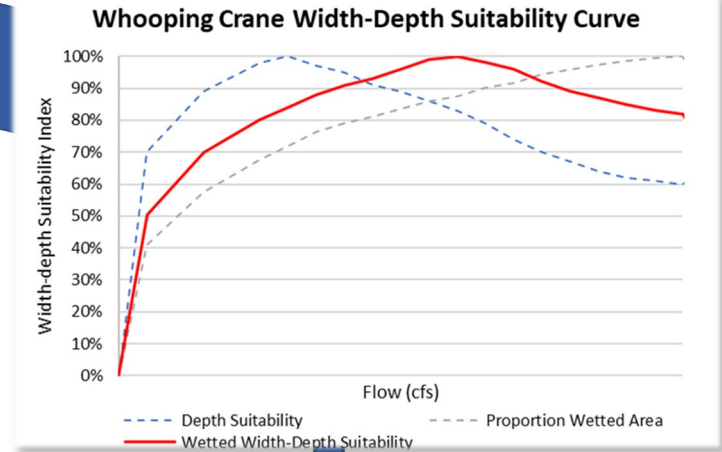
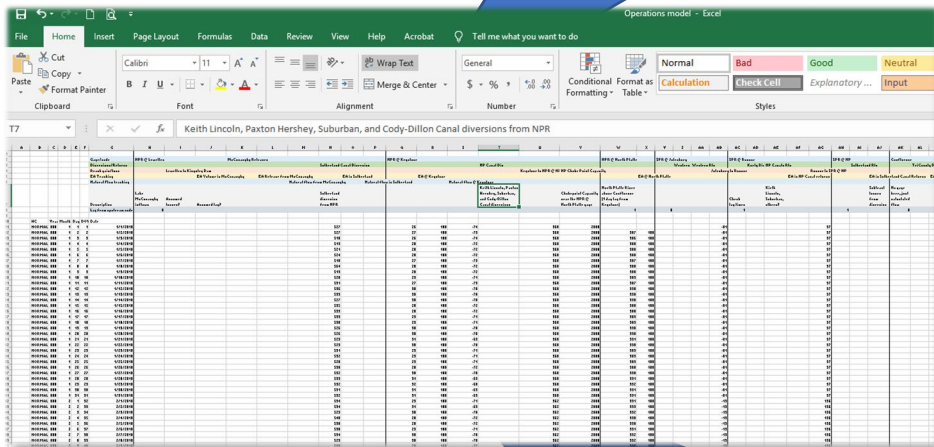
Clarify Uncertainties

Identify management actions

Identify CEM linkages



Tool Development Update



Did anyone actually do this?

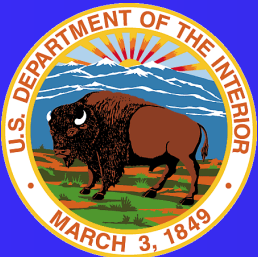
Assigned Reading:

- *Adaptive Management on the central Platte River—Science, engineering, and decision analysis to assist in the recovery of four species.* Smith, 2010
- *Instream Flow Recommendations for the Central Platte River, Nebraska.* Bowman, 1994 (Skim)
- *Characterization of Hydrologic Conditions to Support Platte River Species Recovery Efforts.* Andersen & Rodney, 2006



Environmental Account Update

WAC
Spring Meeting
May 7, 2019



**U.S. Fish and Wildlife Service
Region 6 Water Resources**



Presentation Topics

- Possible Releases this Year
 - Would like to release ~ 60 to 80 kaf
- Accounting, if no release
 - ~180 kaf by May 1, 2020
- Next year - most likely not dry

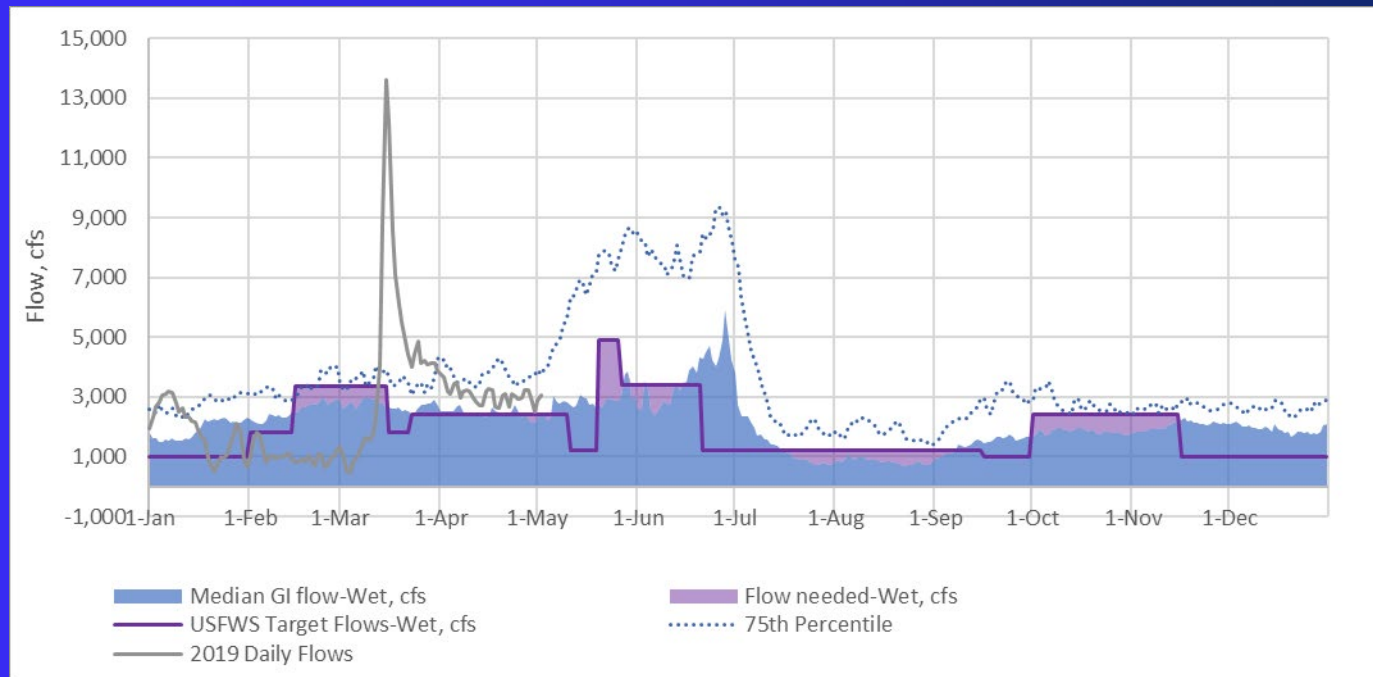
2019 AOP Update

<i>Date</i>	<i>Target Flow (cubic feet/sec [cfs])</i>		<i>Purpose</i>	<i>Priority</i>	<i>Status</i>
	Normal	Wet			
Oct 1-Nov 15, 2018	1,800	2,400	Whooping crane, waterfowl	High	Completed (36 kaf)
Feb 15-Mar 15	3,350	3,350	Channel maintenance, wet meadow recharge	Medium	Cancelled
Mar 23-May 10	2,400	2,400	Whooping crane	High	Cancelled
May 11-Sep 15	1,200	1,200	Terns and plovers, aquatic community	High	~37 KAF
May 20- Jun 20	3,400	3,400	Channel maintenance, test chokepoint	High	~29 KAF

Volume estimates are for wet years. May 20 to June 20 estimate does not include pulse from May 20 to 26 of 4,900 cfs

- Chokepoint test postponed
- Three possible releases this year
 - May 11 to Sep 15 Release
 - May 20 to Jun 20 Release
 - Possible Autumn Whooping Crane (~53 kaf)

Wet Year – Flows



- Possible releases during median wet years (purple shading)
 - Approximately 120 kaf needed (May – Nov)
- Around 25 percent chance of no releases

Estimated EA Volumes (no releases)

Date	Gain(kaf)	Loss(kaf)	Volume(kaf)
May 1, 2019	--	--	102.1
Sep 30, 2019	--	4.8 ¹	97.3
Mid Oct 2019	43.0 ²	--	140.3
May 1, 2020	42.2 ³	3.9 ⁴	178.6

¹ Median Seepage and Evaporation, May thru Sep (2000-2018)
² Gains from: NCCW – 314; CNPPID Lease – 1514; CPNRD Lease – 14,251; and Pathfinder- 26,866.
³ Median SNI (2000-2018)
⁴ Median Seepage and Evaporation, October thru April (2000-2018)

- Leases, SNI and losses will bring record EA levels in 2020

Water Year 2020?

Probably of Calendar Year Type following Calendar Year Type (1942-2018)				
Year N	Year N + 1			
	Wet	Normal	Dry	Total Count
Wet	0.61	0.32	0.07	28
Normal	0.28	0.50	0.22	32
Wet or Normal	0.43	0.42	0.15	60
Dry	0.06	0.41	0.53	17

- Most likely not a dry 2020

Wrapping It Up

- Looking forward to release opportunities
 - May through September and then October through mid-November
 - 25 percent chance there may be no releases
- No releases through May 1, 2020 may result in 180 kaf in EA
- Next year is likely not a dry year

